

ENHANCED PERFORMANCE OF CONVENTIONAL EXPLOSIVE LINE CHARGES"

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Conventional Explosive Line Charges have been used for several decades to clear lanes through mine fields. The line charge neutralizes land mines by applying air blast loads to the pressure sensitive fusing, causing them to function. One serious problem with conventional line charges is the presence of a skip-zone, or an area of low impulse., which is less likely to function the mine's fusing. The skip zone's location presents a serious hazard to vehicles passing through the cleared lane. We have proven it is possible to eliminate the skip zone by elevating the line charge, dramatically increasing the impulse in this area.

A Second Order Godunov numerical code on a rectangular grid was used to simulate the U. S. Army M-58 explosive line charge. This code accurately replicated the skip zone found approximately one to one and half meters on either side of the line charge. Simulating elevation of this line charge not only predicted enhanced performance, but it also provided the optimum height at which to begin the experiments. Subsequent field experiments validated the results obtained from the code. Once this working model was validated, an investigation of line charges of various reduced weights was conducted.

As a result of this combined computational/experimental study, it was concluded that a substantial improvement of M-58 line charge performance can be achieved by suspending it at a standoff distance. Due to the use of computational tools, this conclusion was reached in an extremely short time with minimal use of resources and with a high degree of confidence.