

CALIBRATION OF A USER-DEFINED MINE BLAST MODEL IN LS-DYNA AND COMPARISON WITH ALE SIMULATIONS

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ABSTRACT

The calibration of a user-defined blast model implemented in LS-DYNA is presented using full-scale test rig experiments, partly according to the NATO STANAG 4569 AEP-55 Volume 2 specifications where the charge weight varies between 6 kg and 10 kg and the burial depth is 100 mm and deeper. The model calibration is performed on the specific impulse obtained from the Westine empirical model and on the shape of the applied triangular pressure profile (peak pressure and duration). The verification between the model and the experiments is based on global effects (jump height and total impulse transferred to the test rig) as well as local effects (deformation of the local plate). ALE simulations of the mine blast loading event are also presented and compared with the user-defined blast model and experiments. The results show that the load from the ALE simulations is in good agreement with the user-defined blast model for shallow buried small charges, but is under-estimated for deep buried and heavy charges.