EVALUATION OF THE 2,0-M DIAMETER BLAST SIMULATOR DRIVEN BY FUEL-OXYGEN EXPLOSIVE CHARGES

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A 2.0 m diameter blast simulator driven by Fuel-Oxygen-Explosive mixtureshas been developed, built and tested. Primary goal is to test nuclear,conventional and non-ideal explosion effects on military and civil objects.

A mixture of acetylene and oxygen was selected as an initial charge, butthe system is suitable for any kind of mixture. Acetylene and oxygen mixtures are well-known for their high energy output and low ignition energy for direct initiation and detonation. The structural lay-out of thesimulator will be described, as well as the gas loading system, the ignition system and some other peripheral systems associated with the operatingsystems of the simulator. The results of the evaluation trials are comparedwith preliminary computational codes such as BSWAVE, which is based upon an adapted method of Brinkley-Kirkwood, or BLAST, which is based uponan FCT algorythm finite difference scheme. At a later stage also the Random Choice Method (RCM) is applied and results will be discussed.

The gas flow system allows other mixtures to be used then Fuel-Oxygen-Explosives, such as Fuel-Air-Explosives for examples. It will be possible, therefore, to simulate Fuel-Air explosions and unconfined vapor cloud explosions and their effects on military and civil objects.

The open-ended simulator is partially closed by means of a gasdynamicreflection eliminator which causes reflected waves inside the simulatorand let them interfere with each other. The eliminator also serves as a barrier for fragments of window panes which can be mounted to the simulator. Future developments such as an extended soil test bed are discussed.