AIRBLAST PREDICTIONS IN TUNNEL/ENTRANCE CONFIGURATIONS DUE TO HE-DETONATIONS NEAR THE TUNNEL PORTAL VALIDATION OF NUMERICAL CALCULATIONS WITH A 2D PC RUN CODE

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Recent developments in non-nuclear weapons technology (e.g. improved guidance systems) increase the potential threat of conventional weapons to protective structures. The knowledge about the effects of such weapons in tunnels and tunnel entrance configurations is rather scarce compared to the nuclear case. Therefore, the NC Laboratory Spiez recently started an experimental research program in order to investigate the propagation of blast waves in straight and L-shaped tunnels for the case of HE-detonations inside the tunnel and near the tunnel entrance. Some of these small scale test results have already been presented at MABS 11. These experimental data were now used to validate numerical calculations performed with a two-dimensional finite difference hydrodynamic computercode, called AUTODYN2D. This code is commercially available and can be run on a 486 Personal Computer. In our Laboratory it is mainly used to accompany the experimental tests theoretically and to perform pre-test calculations in order to optimize experimental test series. The code includes equations-of-state for
the burn of several high-explosive materials and utilizes powerful Euler and Lagrange numerical techniques. In this two-dimensional work both planar and axially symmetric problems can be treated. However, three-dimensional blast diffraction phenomena as encountered e.g. at the tunnel entrance car) also be handled using appropriate 2-D numerical modeling techniques. In this paper numerical results-for two tunnel configurations-are compared to experimental ones.