

TESTS ABOUT THE POSSIBILITY TO USE THE MAIN ENTRANCE TUNNEL OF AN UNDERGROUND AREA AS A SHOCKTUBE TO PRODUCE SHOCK-WAVES

ACKERMANN,J.

Proving Ground 52 of the German Army provides an underground tunnel-system with tunnels of various cross-sections. As there is no suitable shock-tube facility available in Germany for testing of large military equipment such as vehicles or tanks against nuclear weapon effects we tried to use the main entrance tunnel as a shock-tube. The cross section ratio between tunnel and target is in the adverse case just 3:1, the tunnel itself runs in a curve and the wall surface is made of concrete. The shock-wave is produced by firing 36 high pressure containers with a volume of 400:1 filled with compressed air of 200 bar.

Measurements in different levels in the half way area of the empty tunnel show that shock waves with a peak overpressure of 1.2 bar can be produced, tests with targets included show peak overpressure values up to 1.4 bar. Ernst Mach Institut conducted small scale model tests with respect to the tunnel shape to find out what the flow characteristics during the drag phase of loading are, and whether there is a transformation to free field tests possible.