

STUDIES ON THE USE OF HEATED GAS FOR DRIVING A LARGE BLAST SIMULATOR

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This paper present results of studies to support the development of a large blast simulator which, when constructed, will be the largest facility of its kind in the world. The key elements of the proposed simulator will be a bank of steel vessels (called drivers) containing pressurized gas and an in-line tunnel through which an air shock wave travels after a rapid discharge of the drivers. Objects to be tested in the simulated air shock environment will be located within the tunnel at an optimum distance from the driver.

The lowering of gas temperature during adiabatic expansion is generally known to cause anomalies in the shape of simulated shock waves. One method to effect a more ideal shock wave in such a facility is to pre-condition the driver gas with a heat amount equivalent to that lost in the gas expansion.

Development of concepts for preheating driver gas was the objective of studies which are reported in this paper.

Alternative concepts for gas heating systems were analyzed in term of expected performance and cost. Energy costs for gas heating were an important aspect in the derivation of life -cycle costs. It was necessary to also investigate driver insulation and cooling systems as they related to the proposed construction.

Driver gas heating studies were integrated into concurrent studies being performed to establish overall configuration of the blast simulator. The practicality of driver heating could then be weighted against other facets of conceptual design.