A METHOD FOR PREDICTING THE TEST SECTION BLAST PARAMETERS OF A 5.8 METRE DIAMETER BLAST SIMULATOR

VIGIL,M.G.

Blast simulation techniques using a 5.8 meter diameter blast tunnel at Sandia Laboratories have been presented in previous blast symposia.

Recent requirements for subjecting large aircraft components to simulated nuclear blast environments have met by increasing the blast simulator length from 93.3 meters to 198 meters (650 feet). Centered cylindrical
composition C4 explosive is now used in the o.6 meter driver section to generate the blast wave. Both of these modifications have resulted in the production of cleaner, more uniform pressure profiles in the test section. The use of concentrated explosive charges has made it possible to apply an analytical technique to predict the test section parameters.

The paper discusses use of an empirically efficiency factor with Kirkwood and Brinkley´s free-field blast theory to predict test section parameters. Theoretical and measured overpressure data from 20 recent tests compared. A dimensional analysis technique is also used to correlate charge weight with measured static overpressure, peak reflected overpressure, shock arrival time, and static impulse. Test section static overpressures varied between l.724 KPa (0.25 psig) and 41.369 KPa (6 psig) with explosive weights ranging up to 21.3 Kg (47 lb). Positive phase flow duration was about 80 milliseconds for all tests.