

A COMPUTER SYSTEM FOR PRESENTING THE PROPERTIES OF BLAST WAVES

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An expert system will be described which can be installed on a personal computer to provide information about the physical properties of blast waves produced by a range of explosives, detonated in an atmosphere prescribed by the user. The data bases accessed by the system have been developed using experimental measurements made on a large number of explosions and include data for surface burst height-of-burst and free-field configurations. Properties of the blast waves are reconstructed using a numerical technique which summarizes the experimental data in a physically consistent manner. The physical properties which can be output include hydrostatic, dynamic and total pressures, density, temperature, particle velocity, sound speed, energy and available energy. These can be presented, in either numerical or graphical format, as the peak values at the shock front as a function of distance, as time-histories at specified distances and as distance profiles at specified times. AN interpolation option is available to determine properties such as positive phase duration, and time-histories can be integrated to obtain, for example, pressure impulse.

Illustrations will be presented of the menus from which the user may select the type, size and configuration of the explosive charge and examples will be given of the available outputs. The program contains a context-sensitive help facility and can be used without extensive reference to a manual. The program has been written in modular form in order to be able to revise data, add new data as they become available, or tailor the program to a specific past or future experiment.