LB/TS PREDICTIVE TOOL

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The S-Cubed Division of Maxwell Laboratories, Inc. has produced LBTS PC-TOOL as a supporting product for the operation of the Defense Nuclear Agency Large Blast / Thermal Simulator facility. The LBTS PC-TOOL is intended to be a culmination of S-Cubed's modeling effort. The modeling effort was undertaken in order to provide a method for determining the initial driver conditions necessary to produce a desired test condition without having to resort to a hydrocode calculation. The model is based on a set of quasi-empirical fits to characteristic parameters obtained from a series of two-dimensional hydrocode calculations. These calculations were initialized with driver conditions representing, a variety of configurations within the LB/TS envelop of operation.

The LBTS PC-TOOL design includes a Windows-based graphical user interface intended to provide the user access to its capabilities with a minimum of effort necessary to learn its operation. As a analytical tool, it is intended to enable the user to examine a large variety of parameter combinations easily and rapidly. Parameters representing, fundamental and derived quantities spawned in the literature of the developing study (i.e.. ratios of driver-to-ambient temperature and pressure) are incorporated to specify either an initial driver gas configuration or a desired target test condition.

Anticipated future development includes incorporation of actual test results into the model, and the inclusion of the results of other modeling efforts, modeling of driver evacuation behavior I" (Blowdown), modeling of the Thermal Radiation Simulators (TRS), and modeling of thermal layer influence, boundary layer influence, and blockage effects. The results of several LB/TS tests are available for validation and the model compares favorably.