VALIDATION OF HPAC FOR ANALYSIS OF DOWNWIND HAZARDS FROM BLAST EVENTS

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The Defense Special Weapons Agency (DSWA) is developing the Hazard Prediction and Assessment Capability (HPAC). This capability can be used to evaluate the atmospheric Transport of hazardous materials from a variety of sources, including those induced by explosive blast events at structures containing hazardous materials. As part of the Scientific, Engineering and Technical Assistance contract for DSWA, we applied the models to a number of blast event field trials and here compare model predictions with experimental data.

DSWA sponsored small, mid-size, and large field trials to evaluate a number of conventional bomb effects upon a range of structures. This work included an evaluation of the so-called collateral effects when such an attack occurs on a structure containing hazardous materials which may be transported in the vicinity of the structure, possibly impacting populations. This is the subject of the HPAC program.

HPAC includes a range of models to estimate the amount of hazardous material released within a structure and to the atmosphere due to blast events. We compare results of the engineering model for blast effects, STEP, with the available data from DSWA sponsored tests. These include internal blast environments, as well as the expulsion of tracked materials to the atmosphere. Also, we compare the atmospheric expulsion results of the quick-running algorithms employed in the BFAC module.

Some of the DSWA field trials included diagnostics to measure the downwind atmoshperic Transport of tracked materials to as far as 1 O's of kilometers. Using the above expulsion source terms, we compare the SCIPUFF model Transport predictions with available data, including elevated, remotely sensed SF6 concentration fields and surface ground-sampled particulate doses. We also review the sources of wind data used, and validation status of these critical HPAC models.