ASSESSMENT OF BLAST LOAD PREDICTION IN AN URBAN ENVIRONMENT

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The development of blast mitigation methods and the design of structural retrofits depend heavily on the ability to accurately model blast propagation in an urban environment. Existing state-of-the-art numerical models should be tested to assess how precisely the complicated reflection, diffraction, and diffusion of the blast wave can be predicted. Such predictions are critical for predicting casualties and building damage, as well as developing retrofits and methods to mitigate the blast. The Technical Support Working Group (TSWG) and the Department of Homeland Security Science and Technology Directorate (DHS S&T) are addressing this issue through a combined program of half- to full- scale tests of simulated urban environments and the application and assessment of state-of-the-art numerical modeling. The ongoing, multi-year test effort is being performed by the Energetic Materials Research and Test Center (EMRTC). Protection Engineering Consultants (PEC) is managing and directing the numerical modeling component of this program, using a team of highly capable and well qualified organizations, which develop and apply their own computational fluid dynamics (CFD) codes and fast running models (FRMs). The data analysis techniques being applied to this challenging program and the significant findings to date will be presented in this paper.