

EBLAST - A PROTOTYPE EMERGENCY BLAST EXPERT SYSTEM

J.M. Dewey, D. J. McMillin
Dewey McMillin & Associates
Ltd Suite 100, 1741 Feltham Road, Victoria, B. C. Canada V8N 2A4

At MABS15 the authors (Dewey, McMillin and van Netten^[1]) described the design concept of EBlast, an expert system to assist those who must take action in emergencies involving explosive hazards. The prototype version of EBlast has been developed and the program is available for customization and practical application. This presentation will show where it was necessary to modify the original design, and will compare the information provided by EBlast with results from actual explosive incidents.

Introduction

Some years ago, Dewey McMillin & Associates Ltd introduced the AirBlast expert system. AirBlast provides a considerable amount of information about the physical properties of blast waves from free-air, surface burst and height-of-burst explosions, but requires the input of an exact description of an explosive source, its height of burst and the atmospheric conditions. In an explosive emergency, a precise description of the explosive source is rarely available, and the output physical properties of the blast wave must be translated into injury and damage criteria. EBlast is an expert system that accepts imprecise or "fuzzy" information about an explosive source as input, and outputs information about the likely injury and damage ranges should an explosion occur in a variety of urban environments.

Analysis of a database containing information about a large number of unplanned explosive incidents, showed that the largest number of deaths and injuries were caused by solid chemical explosives detonated in urban environments. These were usually in the form of terrorist devices and military munitions. It was therefore decided to concentrate on these two types of sources in the prototype version of EBlast. The principal terrorist devices are vehicle, pipe and package bombs. The EBlast interface allows the user to select, via menus, a wide range of such devices, either in specific form, such as a particular vehicle model, or in generic form, such as "a medium sized van". For the chosen device, EBlast assigns an appropriate explosive charge mass, which can be altered easily by the user if thought to be invalid. Examples of the "Explosive Device" menus are shown as figure 1.