

## **BLAST MODELING AND DESIGN OF BLAST RESISTANT STRUCTURES**

Arun Parihar, P.E.  
Energo Engineering/KBR  
1300 West Sam Houston Pkwy, Suite#100  
Houston, TX, 77042  
Tel: (832)671-1787 Email Address: [arun.parihar@kbr.com](mailto:arun.parihar@kbr.com)

### **ABSTRACT**

Blast modeling and general methodology adopted in the design and retrofit of structures is presented. Estimation of blast loads from blast curves and computational fluid dynamics (CFD) is discussed. Congestion and confinement are two important factors which determine the strength of a vapor cloud explosion, in addition to the fuel type. It has been observed from experiments that blast curves give reasonable prediction only for far field explosions. For more accurate estimation of blast loads and near field explosions CFD based approach should be preferred.

General methodology for design and retrofit of buildings is discussed. Performance based design approach is adopted for the design of blast resistant structures. The design approach allows the structures to go in the plastic range in-order to absorb the high blast energy. Ductility and member end rotations are limited to permissible values, so that the structural stability is not compromised. Pressure-impulse curves (or lines of constant damage) can be generated to evaluate the performance of a structure subjected to the dynamic blast loads.