BLAST EFFECT ASSESSMENT GENERATED BY EXPLOSION IN COMPLEX STRUCTURE BUILDINGS: EXPERIMENTAL MEASUREMENTS AND NUMERICAL SIMULATIONS

Julien MORICEAU [(1)], Christelle COLLET [(1)];Yves GUENGANT [(2)]

(1) SAFRAN – SME Centre de Recherches du Bouchet, Vert-Le-Petit, France
www.materiaux-energetiques.com

(2) SAFRAN – SME Environnement, Vert-Le-Petit, France
www.sme-environnement.com

Key words: Blast Overpressures – Experimental Measurements – Numerical Simulations – Reduction/Amplification Blast Effects – Complex Building Geometry

SAFRAN – SME (former SNPE Matériaux Energétiques) possesses a great number of buildings for many activities. It is not always pertinent to apply basic formulas of pyrotechnic regulation for accidental blast effects assessment. That is why, work safety studies are conducted using calculation methods dedicated to various specific configurations.

The relative methodologies are designed by SME Environnement team with the support of experimental and numerical simulation laboratories. These methodologies are based on tests and empiric laws coming from numerous sources and completed by analytical calculations and numerical simulations.

Recently concerning new workshop, specific blast effect tests using small scale models were done and results were analysed through 3D numerical simulations. Through that way, it is possible to determine the reduction / amplification blast effects given by complex geometry of buildings.

Numerical simulation example is detailed on workshop dedicated to solid propellant processing; it is constituted of strong and light walls, it is partially surrounded by barricade.

This paper presents various experimental and calculations works; results are compared with existing empiric laws.