NUMERICAL MODELING & PREDICTION OF BLAST PRESSURES & HUMAN INJURIES IN A BUS BOMB SCENERIO USING AUTODYN

Andy Tan Hong Wei[1], Chew Soon Hoe[1], Chen Kaizhen[2], Serena Tan[2],
Karen Chong[3] & Joel Ong[3]

[1] Department of Civil & Environmental Engineering, National University of Singapore (NUS)
[2] Defence Medical & Environmental Research Institute (DMERI),
Defence Science Organization (DSO)
[3] Defence Science & Technology Agency (DSTA), Singapore

Keywords: Bus Bomb, Modeling, Prediction, Blast Pressure, Human Injury

The 3-D computational fluid mechanics (CFD) program, AUTODYN has been used extensively for the prediction of blast pressures in free field & indoor explosions. In this paper, AUTODYN will be used to predict the blast pressures and human injuries that occur in the event of an explosion inside a bus. Two cases were considered, namely an actual bus explosion in the late 1980s (paper by Katz et al, 1989) and a bus explosion modeled and field tested by Antanovskii et al (2010). In the actual bus explosion, blast pressures and impulses obtained from the modeling were used to predict the human injury and these results were compared to the actual injury observed. For the modeled and field trial case from Antanovskii (2010), blast pressure comparisons were made with the numerical and field blast trial results. It was found that with proper modeling, AUTODYN was able to give a reasonably accurate prediction for both the blast pressures and human injuries.