CONSEQUENCE ANALYSIS FOR URBAN OR ATYPICAL BLAST SCENARIOS USING WALAIR

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Abstract:
Traditionally when siting explosive ordnance (EO) storage facilities, the Quantity-Distance (QD) rules are applied to define the stand-off distance between an Exposed Site (ES) based on the Net Explosive Quantity (NEQ) of the facility. These empirical assessments typically perform well when the NEQ is based on a TNT equivalent is known and the blast wave is able to propagate from the incident site to the ES with negligible hinderance to the blast wave from interactions with urban structures or topological elevation changes. In addition, under scenarios where the QD rules cannot be met, minimal guidance is provided on performing a risk-based analysis of the scenario including defining the consequences of an incident.

This paper will describe a methodology for assessing the consequences of an incident for an EO storage facility, where the QD rules cannot be met and an incident would result in blast / fragmentation loading on an urban environment.

An exemplar Warship In Harbour scenario is presented where the blast loading is modelling using the Thornton Tomasetti (TT) in-house GPU-based CFD code WALAIR++. A series of model runs will be presented which detail the effect of the NEQ mass on the predicted level of human injury and building damage. The results highlight the importance of considering the charge casing and ship configuration in defining the NEQ to ensure that results are not overly conservative.