OVERVIEW OF NEW AND INNOVATIVE MATERIALS AND CONSTRUCTION SYSTEMS FOR BLAST MITIGATION

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Over the last two decades, continuous techniques, construction materials and systems have been developed to provide adequate protection to building occupants during a blast event. Building façade debris and fragmentation, which result from common construction materials such as masonry, concrete and glass, are major causes of human injury during such an event. Case studies will be presented on mitigation techniques and systems for these common construction materials utilizing innovative materials to provide needed structural upgrade and/or catch systems to resist extreme blast loading and/or flying debris hazards.

This topic will illustrate innovative materials and construction systems that have been validated through blast testing and dynamic analysis. The discussion will focus on masonry and concrete retrofits incorporating Fiber Reinforced Polymers (FRPs), pre-fabricated and spray-on polyurea systems, micro-reinforced concrete (MRC) systems and fiber-reinforced concrete (FRC). In addition, glass debris mitigation approaches utilizing polycarbonate, polyurethane sheets, cable-catch systems and other methods will be presented.