# COMPUTATIONAL ANALYSIS OF EXPLOSIONS NEAR A RIGID WALL – EFFECT ON INJURY POTENTIAL

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Explosive Ordnance Disposal (EOD) technicians often have to remove or disarm improvised explosive devices located near confinements, or reflecting surfaces, such as a wall. When an explosive device detonates in the vicinity of a wall or other confining surfaces, the resulting blast loading felt by the technician is potentially increased due to blast reflection, and possible reinforcement, from the rigid surfaces. This may result in higher probabilities, and a higher level of severity, of chest overpressure and head acceleration concussive injuries, amongst other effects on a victim. With the intent of reducing this additional threat from the presence of reflecting surfaces near an explosive device, some EOD squads suggest in their Standard Operating Procedures (SOP's) that explosive devices located near a wall be approached at a specific angle, with the belief that blast pressure loading would be less severe, as compared to a direct approach (perpendicular to the wall). The objective of this paper is to investigate the appropriateness of these SOP's through a demonstration of the effect of the angle of approach. For this purpose, 3D computer simulations of explosive charges (1.5 and 5.0 kg C4), located at various distances (0 to 1.0 m) from a rigid wall, were carried out, using the IFSAS code (Martec). The pressure signals at various positions (standoff, angle) were analyzed, and injury predictions were generated. Based on this injury analysis, it is demonstrated that approaching the device at an optimized angle, based on the particular scenario, can indeed reduce the probability and severity of injury. While the optimum angle of approach may vary from one situation to the next, there are some general conclusions that can be drawn from the study thus far. These results have not yet been validated experimentally.