INTERNAL BLAST CONSIDERATIONS FOR EXPLOSIVE-FORCED ENTRY

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Explosive Forced Entry (EFE), often referred to as Explosive Breaching, is conducted by police, SWAT and military personnel all over the world. These breaches are conducted on numerous types of walls and doors, and in a variety of environmental settings, with the most dangerous to the personnel being within fully confined locations, such as hallways and corridors. These internal breaches lead to blast reflections off the nearby walls, ceiling and other large objects causing secondary shocks felt by EFE operators. To assess their injury risk, breachers use a rule of thumb referred to as the Internal Residual Overpressure (IROP) calculation, based solely on the volume of the room and the weight of the explosive, without consideration for the detailed physical configuration and dimensions of the internal volume. Ideally, EFE operators should have access to data from Computational Fluid Dynamics (CFD) modeling, customized for their specific configuration (explosive charge size, room configuration and size, location of explosive within room). Unfortunately, due to time restrictions and a lack of computing power on hand, EFE operators cannot rely on such detailed numerical simulation results. A simpler and more mobile, yet customized solution is desirable.
To address this gap, a simple android application has been built to estimate the peak pressure. It creates simplified pressure contours by combining multiple Friedlander blast curves based on the Low-Altitude Multiple Burst (LAMB) methodology. This paper will compare the traditional “rule of thumb” IROP calculations with the high-level predictions generated by the android application in the context of real world trials conducted in representative environments, as well as selected detailed CFD simulations.