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INTERNAL VENTING OF A FULLY EMBEDDED WARHEAD

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A number of hardened military structures are specifically designed to resist damage from a penetrating munition. Protective measures include thick layers of soil and concrete, rock, steel, etc. Prediction tools currently used to assess the effectiveness of conventional weapons require that a portion of the warhead penetrate into the airspace of the structure prior to detonation before any credit is given to achieving some level of damage to the internal components. There are many situations, however, where the munition fails to penetrate to the point that a portion of the warhead is inside the airspace but instead remains embedded in the protective material surrounding that airspace. Recent tests have demonstrated that under these embedded conditions, even when no part of the warhead is inside the structure, a substantial amount of shock and blast can be vented into the internal airspace. This paper will describe two tests that investigated this embedded detonation and pre- and post-test analysis to estimate the amount of equivalent explosive that would need to be “fully” inside the airspace to match the pressure and impulse from the actual test data. Damage to computer equipment placed inside the test structure during one of the tests will specifically be used to demonstrate the ability of an embedded detonation to achieve damage under this condition