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INTERNAL BLAST MOMENTUM LOADS OF CYLINDRICAL CHARGES WITH DIFFERENT CASING THICKNESSES

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Measuring the combined blast and fragment impulse loads from cased charges has always been a difficult task, all the more so when the charges are detonated internally within confined spaces. A novel method for estimating the momentum loads from cased charges detonated in free air was previously described in MABS 17. In the present work, the method has been extended to cased charges detonated within an enclosure. The paper presents the results of a series of field trials conducted using generic cylindrical explosive charges with an L/D ratio of 5 and different case thicknesses (starting with a bare charge - zero case thickness), detonated within a 13.5m³ steel chamber. Momentum loads from the combined blast and fragments of these cased charges were measured at different stand-off distances by placing target plates in 'windows' cut into the walls of the chamber. The validity of the method was first checked by confirming the consistency of the momentums obtained for blast loads alone from the bare charge condition with impulses obtained from more conventional pressure measurements taken concurrently in the blast chamber, as well as with numerical simulations. The test series showed the relative effects of different casing thicknesses on the overall momentum loads, as well as the dependence of distance and orientation with respect to the charge.