

Abstract Submitted  
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**Low-velocity impact ignition of thin metal-cased charges of PBX 9501**<sup>1</sup> MATTHEW HOLMES, GARY PARKER, PETER DICKSON, ERIC HEATWOLE, BOB BROILO, Los Alamos National Laboratory — Accident scenarios involving an explosive worker handling a cased charge can result in low-velocity impact insults. A series of experiments was performed with 1mm thick metal plates encasing 1 in. x 1 in. cylindrical charges of PBX 9501. Penetrating events were demonstrated to result in ignition and a propagating violent deflagration at velocities as low as 1.5 m/s. Variations in tip geometry and case material were explored. The mechanism of heat localization is shown to be frictional interaction between the penetrating tip and the case material. The ballistics of the penetration was analyzed as a ductile hole enlargement failure mechanism to develop an analytical expression for the maximum work deposited during the event, thus obtaining a conservative threshold for predicting response.

<sup>1</sup>Low-velocity impact ignition of thin metal-cased charges of PBX 9501

Matthew Holmes  
Los Alamos National Laboratory

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