

THE EFFECT OF LONG DURATION BLAST WAVES ON WINDOWS

L. J. Adams¹, P.S. Mattingley¹, R. Garforth² & G. Evans et al²

¹*AWE, Aldermaston, Berkshire, RG7 4PR, UK*

²*Spurpark Trials Group, Foulness, Essex, SS3 9XE, UK*

Long duration blast waves can cause significant damage to structures and personnel. Glass fragments in particular have been previously reported to be a major hazard, as the large blast winds generated in a long duration pulse act to accelerate the glass fragments.

In order to investigate the potential hazard caused by energised glass fragments a series of 10 trials were conducted in the Nuclear Blast Simulator, Foulness between July 2008 and January 2009. For each trial a 150ms positive phase duration blast wave was incident on a 0.86m x 0.865m, 4mm thick, plate glass window. The target incident overpressure at the window was varied for each trial between values of 7kPa and 70kPa.

Accordingly, results of glass fragment spatial distribution, speed and mass from these experiments will be presented. It will be shown that the speed of the fragments is approximately equal to the peak particle velocity of the blast wave, and the effect of cotton fabric on reducing the number of penetrating glass fragments will be demonstrated. The extent of the glass fragment spread will be presented as well as attempts at defining regions of high, low and no hazard.