TESTS OF A NEW TACTICAL SHELTER IN THE FRENCH LARGE BLAST SIMULATOR AND AT WHITE SANDS MISSILE RANGE (MILL RACE)

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A series of blast simulation tests were conducted in June and November, 1981 at the French Large Blast Simulator (FLBS), Centre d'Etude de Gramat (CEG), Gramat, France and in September 1981 at the White Sands Missile Range (WSMR) New Mexico, USA to verify the design of a new hardened tactical shelter. One prototype of this shelter was tested in the FLBS and two prototypes were tested during the large high explosive (HE) blast event MILL RACE at WSMR. A correlation study was conducted to compare the two
sets of experimental shelter structural response data with the theoretically predicted responses using the large finite element, elasto-plastic, structural response Code ADINA.

The tests at CEG were part of a joint Franco-American Program. The shelter was mounted on a 2.5 ton truck and three tests were conducted: 1) at an overpressure of 4.3 psi to check out the instrumentation system, 2) at 8.2 psi (with the shelter "side-on") to compare with MILL RACE and 3) at 8.2 psi (with the shelter "door-on") to verify the adequacy of the door and hardware design. Structural response data and high-speed cine films were obtained.

MILL RACE was a simulation of a 1 kt blast. Two shelters, each mounted on a 2.5 ton truck, were exposed, one of each at overpressures of 6.2 psi and 9.1 psi. The shelter at 6.2 psi also received 40 cal/cm2 of radiant energy from a thermal Radiation Simulator. The instrumentation was similar to the shelter at CEG.

The series of tests were successful: the shelter design goals were met and there is good correlation between experimental and theoretically predicted structural response. Results are presented in this paper.