



September 27 - October 01, 2004, Bad Reichenhall, Germany

LARGE BLAST/THERMAL SIMULATOR TESTING ENVIRONMENT

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The Large Blast/Thermal Simulator (LB/TS) at White Sands Missile Range, New Mexico is operated and maintained by the Defense Threat Reduction Agency (DTRA). The simulator includes a 550-ft-long (165 m) tunnel with a semi-circular cross section with a radius of 32.8 ft (10 m). This facility is used for the survivability testing of Department of Defense (DOD) equipment to the combined effects of thermal radiation and blast from low height-of-burst nuclear detonations.

The blast simulation is produced by sudden release of heated, pressurized nitrogen gas into the tunnel from pressure vessels (driver tubes) on the closed end. Eight thermal jets located just before the target section of the LB/TS produce thermal simulation. These generate intense flames by combusting powdered aluminum in liquid oxygen spray. By using the thermal simulation, a target is exposed to extreme radiant heat before the shock wave arrival, simulating the heat generated by a fireball from a detonated nuclear weapon. Thus, the synergistic effects of properly time-phased thermal and blast loading on the test article can be evaluated.

The driving tubes have been recently modified in the spring of 2003. The air blast wave generated with the new tubes has increased the duration of the waves. Test results and calculation with the new driver tubes show this new testing environment.

This paper will include the current air blast and thermal capabilities of the LB/TS. It will cover an analysis of the results from the series of tests.