

DIRECT AND RICOCHET FRAGMENT DAMAGE TO WATERFILLED TANKS IN A LONG BAY

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Jeffrey M. Thomsen, Craig S. Sheffield
Applied Research Associates, Inc., P.O. Box 5388, Albuquerque, NM, USA 87185

Audrey A. Martinez
Defense Threat Reduction Agency, 1680 Texas St. SE
Kirtland Air Force Base, Albuquerque, NM, USA 87117

The Defense Threat Reduction Agency (DTRA) conducted a series of tests to expose water-filled tanks to blast and fragmentation effects. The tests were performed at Kirtland Air Force Base (KAFB), Albuquerque, NM, USA, and were designed to provide advanced analytical assessment of probable equipment damage levels and for damage modeling. The fragmenting sources used were Composition-4 charges placed in cylindrical steel cases with two different case thicknesses and explosive weights. Test arrays consisted of water-filled tanks and related equipment installed in long bays with reinforced concrete walls. For all tests, identical tank arrays were installed on the ground surface in the free field to permit damage comparisons to the tanks within the bay. Hydrodynamic pressure gages were installed within some of the water-filled tanks. Posttest damage assessment was extensive and concentrated on damage to the tanks, damage to the reinforced concrete walls of the bays, and damage to witness plates placed behind the equipment arrays. Key results discussed include direct and ricochet fragment velocities and their effects on water-filled tanks. Comparisons are made for damage to water-filled tanks caused by direct and ricochet fragments at the same range from the explosive sources.