EXTERNAL AIRBLAST CALCULATIONS FROM AN EXPLOSIVES STORAGE MAGAZINE DETONATION

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A series of two-, and three-dimensional hydrodynamic computer calculations has been completed to determine the airblast produced outside an underground storage magazine due to the accidental detonation of explosives stored inside. The calculations model the 20,000 kg test conducted in August 1988, at the Naval Weapons Center, China Lake, California. The SHARC hydrodynamic computer code was used to perform the calculations.

Prior to running the external calculations, several two-dimensional calculations of the charge detonation and the internal airblast propagation were completed to determine the proper treatment of the storage magazine and adjoining tunnel walls. The response of these walls was found to have a significant effect on airblast waveforms within the tunnel complex. The calculations showed that modeling the walls and overburden with a granite equation-of-state provided good agreement with experimental data.

The external calculations incorporated the granite model and used the results of the internal calculations to propagate the airblast to a low overpressure of approximately 50 mbars. The two-dimensional calculation
simulated a flat exterior surface, while the three-dimensional calculation included a model of the actual terrain outside the tunnel portal.

Comparisons between the calculational and experimental airblast waveforms are presented. An analysis of debris particles and artificial ejecta has been included.