

USE OF CORRTEX TO MEASURE EXPLOSIVE PERFORMANCE AND STEM BEHAVIOR IN OIL SHALE FRAGMENTATION TESTS

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ABSTRACT

Continuous Reflectometry for Radius vs Time Experiments (CORRTEX) was used to monitor several conditions of blasts such as the detonation velocity of the explosive column, the functioning of different types of initiators and initiation schemes, and the behavior of the stemming column confining the explosive. The CORRTEX data were also used to deduce the occurrence of dead pressing of ANFO slurry. Measurements of propagation speeds of shock waves in the stem column with various cables allowed some conclusions concerning bridging, stem failure, and stress levels in the stem.

CORRTEX used time-domain reflectometry to interrogate the two-way transit time (TWTT) of a coaxial cable. As the shock front advanced the cable was shorted or destroyed and the resultant TWTT was shorter. Interpretation of these changes as a function of time allowed the position of the shock front to be inferred also as a function of time. This paper describes in some detail the CORRTEX technique and how it was applied to in-situ measurements. Detonation velocities are provided for pelletized ANFO and TNT as well as various ANFO slurries. Observations are made on stem performance as well as shock propagation velocities in several stem materials. Cable characteristics and methods of cable selection are discussed as are techniques for instrumentation of complex blasts to provide initiation time and burn velocity.