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Science and Technology for Tomorrow's Air and Space Force

Success Story

EXPLOSIVE SAFETY DETONATION TEST SUCCESSFUL



Researchers from the Propulsion Directorate's Edwards Research Site conducted an explosive safety test involving two small intercontinental ballistic missile (ICBM) stages. By using real rocket motors, researchers designed the test to enhance storage and launch safety procedures for strategic missiles and space boosters.



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Accomplishment

The test provided Air Force system safety organizations full-scale blast and fragment data for validating proper storage and explosive safety of national assets. It used nearly 25,000 lbs of a solid rocket fuel, equivalent to 14 tons of Trinitrotoluene, commonly known as TNT. Space and Missile Propulsion Division researchers provided test data to Lawrence Livermore National Laboratory and other interested organizations to help validate Air Force and industry explosive hazards' computer models.

The test data also supported efforts to validate new North Atlantic Treaty Organization explosive hazard classifications for insensitive munitions. The high-powered, ground-level explosion provided seismic calibration to the US Geological Survey seismic measurement activities at Caltech.

Background

The purpose of the test was to provide simultaneous detonation or reaction between two rocket motors; in this case, a first and third stage of small ICBM motors. Directorate researchers separated the motors at representative distances found in storage bunkers positioned in worst-case scenario conditions and instrumented the motors to provide scientific data for numerous users.

Caltech measured the seismic force of the test at a 1.61 magnitude and dug a 20-foot-deep crater at the test site. The test also provided experimental data on shock-to-detonation initiation pressures and fragment throw data.

Propulsion
Emerging Technologies

Additional information

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTC, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (03-PR-15)