

## Near Field Infrared Experiment

### Kennedy Space Center Range Safety Support of Toxics and Distant Focusing Overpressure Evaluations

On April 24, 2007, an Air Force Minotaur 1 rocket was successfully launched at 2:48 AM EDT from NASA's Wallops Flight Facility in Virginia. The launch took place from the Mid-Atlantic Regional Spaceport's launch pad on the south end of Wallops Island. Click [NFIRE launch video](#) to view the actual launch.

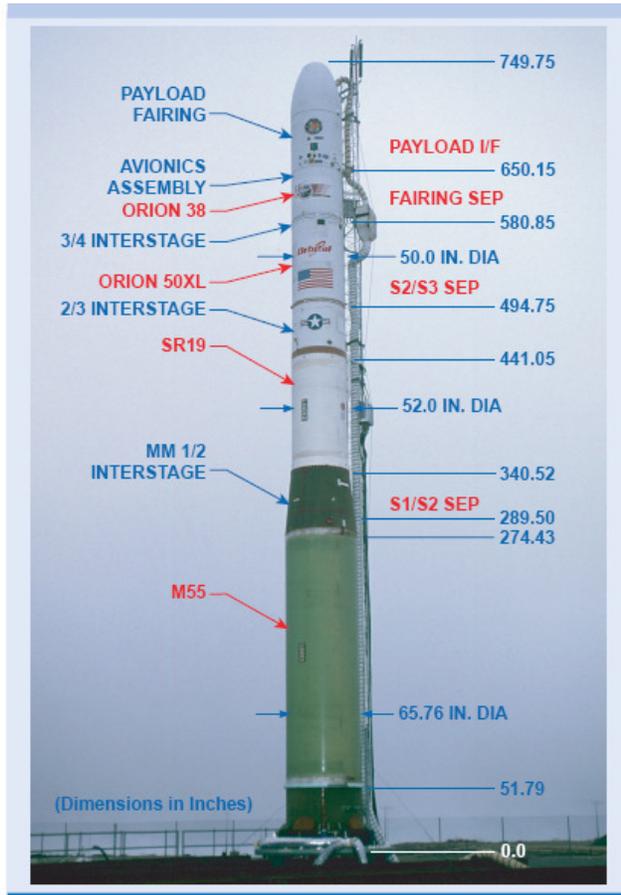
This launch was the second Minotaur 1 launch from Wallops in just over four months. The previous mission on December 16, 2006, carried the Air Force Research Laboratory's TacSat-2 satellite.



### The Rocket

The four-stage Minotaur 1 shown below carried the Department of Defense, Missile Defense Agency's near field infrared experiment (NFIRE) satellite. The Orbital Suborbital Program Minotaur 1 launch vehicle consists of an M-55 (51,514 pounds) and SR-19 (13,740 pounds) first and second stages taken from the Minuteman-2. Upper stages consist of an Orion 50XL motor and Orion 38 motor, both of Pegasus heritage.

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Although launch vehicles of significant size (including the vehicle used for the TacSat-2 mission) have been launched from Wallops Flight Facility in the past, this was the second time Wallops performed a detailed analysis of toxic and overpressure hazards. A Tier 1, or screening evaluation of the TacSat-2 mission performed by the 45<sup>th</sup> Space Wing, revealed an in-depth toxics and distant focusing overpressure analysis was required.

The close proximity of the Minotaur 1 launch vehicle (with over 65,000 pounds of solid rocket propellant) to the off-base public was the driving factor behind the need for more detailed analysis. Based on the large number of data requirements, first time evaluation of these hazards required a significant effort.

Based on acceptable risk criteria contained in NPR 8715.5; *Range Safety Program*, pre-launch and day-of-launch risk analysis must be performed for all expendable launch vehicles launched from Wallops Flight Facility.

## NFIRE Mission Support

Kennedy Space Center Range Safety has gained a great deal of experience in evaluating toxic and distant focusing overpressure at the Eastern Range and has assisted Wallops in the development, coordination, and real-time support of these hazard evaluations.

For the NFIRE mission, Kennedy Space Center Range Safety support to launch day operations consisted of coordinating with the 45<sup>th</sup> Space Wing to provide real-time toxic and distant focusing overpressure modeling support and coordinating with ACTA Inc to provide meteorological and technical support.

The 45<sup>th</sup> Space Wing and ACTA Inc provided significant support to the effort by conducting the real-time analysis as well as training Wallops Range Safety personnel on toxic and distant focusing overpressure modeling techniques.