Autonomous Flight Safety System (AFSS)

The ORS Office is dedicated to transforming launch and providing greater access to space for the DoD, Civil and commercial space industries. Part of this transformation is looking for ways to not only launch in a responsive manner, but reduce the overall cost as well. One way of lowering costs is to reduce the number of engineering and support hours. ORS is investing in technology that not only reduces hours through automation; it also reduces infrastructure and the associated costs of operating and maintaining it.

Mission Description

A collaborative effort was established between the ORS Office and its partners to develop an AFSS that uses on-board tracking and processing to terminate an errant launch vehicle. Traditional Flight Termination Systems rely on a man-in-the-loop to make decisions on the state of the vehicle based on radar tracking and sensory data sent from onboard the vehicle via telemetry. The AFSS brings the decision process onboard the vehicle via digital high speed processing of primarily positional data coming from an onboard Global Position System (GPS) and/or Inertial Navigational System (INS) sensors.

AFSS continuously determines the instantaneous impact point (IIP) of the vehicle based on real-time sensor data, and makes the decision to terminate the flight when the vehicle becomes hazardous with respect to its predicted IIP being in violation of Range Safety Boundary allowances.

Partners

High Speed Systems Test (HSST) Office

30th Space Wing Safety Office

45th Space Wing Safety Office

NASA Wallops Flight Facility

ATK

Major Milestones

Development Complete: Fall 2012

Qualification Testing: Winter 2012

Deliver of First Units: January 2013

Certification Flight #1: ORS-3 Mission, November 2013

Payoffs

Allows for full qualification and range safety approval

Reduces permanent range infrastructure

Supports over-the-horizon operations

Provides remote launch capability where no ranges exists

Enables quick call up to launch systems and automated launch planning and operations

Provides cost savings on a per mission basis, and

Reduces overall operating costs (launch vehicle providers, range safety, maintenance and ground support)

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