Modernizing the Wallops Flight Facility Launch Weather Decision Support System

Readying NASA to Support the Upcoming ISS & LADEE Missions



www.wff.nasa.gov

Richard Stedronsky IPS MeteoStar, Inc. Englewood, CO USA sted@meteostar.com

Overview



Walloos Flight Facility, VA

IPS MeteoStar, Inc. (IPSM) and the NASA Wallops Flight Facility (WFF) have had a long, tenured partnership for nearly a decade. During this time, the activities at WFF have increased dramatically. Expendable Launch Vehicle (ELV) missions have now come to the forefront, and WFF meteorological personnel have been critical to the success of the ELV program. As a foundation to this success, the meteorological department has continued to utilize IPSM's Leading Environmental Analysis and Display System (LEADS®) as its prominent source of weather information processing, visualization and decision support. Due to a flexible and scalable architecture, IPSM has been able to add a wide array of functionality to LEADS® as the WFF customer base has expanded, and their needs have increased in scope and complexity.



lone Teland Launch Facilitie

ORS-1 - June 29, 2011

2004 2005 2005 2007 2003 2009 2010 2011 2012 LEADS* 6.x LEADS® 5.x LEADS® 3.x LEADS[®] 4.x

LEADS® On-Line 1.x LEADS® On-Line 2.x IPSM / WFF Historical Timeline



The primary data source for the WFF LEADS® system comes from the NOAAPort Satellite Broadcast System. Through this feed, LEADS® is able to ingest, process and display numerous meteorological data sets of various types and formats. As this data is processed and internal events are triggered, imagery and textual information are published to LEADS® On-Line: the web-based extension/front-end of LEADS® This allows for easy access to commonly used products and functionality on an intranet exposed web page.



Lightning · Convection (anvils, debris clouds, etc.)

- Vehicle-induced Pre-flight operations
- Winds & Temperature Nominal flight path/trajectory Blast and toxic dispersion Impacts during liftoff Pre-flight operations

www.meteostar.com

Precipitation Vehicle-dependent Pre-flight operations





IPSM Technologies & Support



Upcoming WFF Missions

Taurus II – International Space Station Resupply

Taurus II is a Commercial Orbital Transportation (COTS) Services program that was announced by NASA in 2006. The goal of the program was to be able to deliver crew and cargo to International the Space Station (ISS) via private companies.



It was ultimately deemed as a viable replacement for the Space Shuttle program and is scheduled to launch from WFF in 2012.

Lunar Atmosphere & Dust Environment Explorer (LADEE)

LADEE will orbit the moon to characterize the atmosphere and lunar dust environment. The mission's main purpose will be to determine the global density, composition, and time variability of the lunar surface before it is perturbed by further human activity. It will also be testing a new spacecraft architecture called the "Modular Common Bus" which is being developed by NASA as a flexible low cost, rapid turnaround spacecraft for both orbiting and landing on the moon and other deep space targets. Wallops Flight Facility has been selected as the host facility for the Minotaur V launch which is slated for 2013.





TacSat.3 - May 19, 2009

Aside from the common NOAAPort satellite data feed that WFF receives, there have been many additional developments to integrate WFF unique data types, as well as the mechanisms to display such data. LEADS® and LEADS® On-Line now boast the ability to ingest the WFF Automated Weather Station (AWS) sensor network. This data is displayed in real-time and alert thresholds can be applied so that the user may be notified if mission specific criteria has been violated or is close to being violated. Similar real-time displays were designed for the 300' meteorological tower located near the launch pads on Wallops Island itself. IPSM has also provided the ability to ingest and display the WFF S-band weather radar. LEADS® can now create a composite mosaic that includes not only the National Weather Service (NWS) WSR-88D network but the WFF radar as well. Other functionality recently made available to the meteorological department via either LEADS® or LEADS® On-Line include a web-based briefing tool used during mission counts to provide specific information to the Range Control Center. Ingest and display of one-second radiosonde data, which is used by both the weather office as well as the blasts and toxics plume modelers. A large climatological database (lightning, balloon, surface and model data sets), from which queries have been developed to support the meteorologists in providing on-demand, derived information to customers planning upcoming missions.