STS-115 Post-Mission Summary

The Shuttle Atlantis launched from Kennedy Space Center's (KSC) Launch Pad 39B on September 9th, 2006 at 1515 UTC after several delays due to weather and technical issues. While on-orbit, the astronaut crew successfully completed the installation of the P3/P4 truss and deployed solar arrays to provide additional power capability for the International Space Station. A one-day delay for landing gave the crew time to inspect the orbiter following the observation of unidentifiable debris as well as opportunity to avoid unacceptable weather due to a cold front. Atlantis touched down on KSC's Shuttle Landing Facility (SLF) at 1021 UTC on September 21st under nearly ideal weather conditions.

Weather presented several challenges throughout the final preparations for the launch and on launch day. A squall line passed through KSC on August 25th producing numerous lightning strokes in the area. Cameras monitoring the pad imaged a lightning strike to the pad. The Air Force's Cloud-to-Ground Lightning Sensor System (CGLSS) and the National Lightning Detection Network (NLDN) detected five return strokes with the flash, two of which appear to have struck the pad based on lightning location information and current sensors in the catenary wire system used for lightning protection. A launch delay was required to review data to ensure Atlantis's systems did not suffer any damage. During the launch delay, Hurricane Ernesto's forecast track caused a concern for winds greater than 70 knots at the launch pad. NASA decided to roll the Shuttle back to the Vehicle Assembly Building, but forecast updates during the roll back gave managers confidence that the threat of 70 knot winds had diminished. NASA/KSC managers then decided to stop the "roll back" in mid-course and return the vehicle to the pad was then made.

The first launch attempt occurred on 8 September. During tanking for the launch attempt, a problem with one of the external tank fuel sensors occurred. Mission managers allowed the launch countdown to continue while reviewing data. Forecasters were concerned with potential rainshowers developing along the sea breeze at KSC. SMG issued a "GO" forecast for RTLS 50 minutes prior to the planned launch time of 1535 UTC based on trends in the satellite and radar observations, as well as favorable weather reconnaissance reports. The final updates for the TAL sites predicted acceptable conditions at Zaragoza and Moron. Thunderstorms within flight rule limits produced unacceptable conditions at Istres, France. The mission management team then decided to scrub the launch to allow further time to evaluate the fuel sensor.

Atlantis launched successfully on 9 September, but not without some weather challenges in the hour prior to launch. The primary RTLS concerns entering the second launch count were also the potential for small showers developing along the sea breeze. SMG issued an update at 1435 UTC for a "GO" RTLS removing the forecast of a chance for showers developing with the sea breeze. However, the Shuttle Landing Facility observer reported a cloud ceiling of 1,700 feet at 1455 UTC in association with the development of the sea breeze. Astronauts Kent Rominger

and Mike Bloomfield, performing weather reconnaissance in the Shuttle Training Aircraft, quickly evaluated the clouds and determined there was no concern for the clouds producing a problem with visibility of the landing aids or runway. The cloud conditions improved by 1510 UTC and the KSC observer reported the coverage had decreased to scattered. The weather observations were "GO" at both liftoff and at the RTLS time of 1529 UTC. Thunderstorms in Spain and France produced a concern for acceptable weather conditions at the TAL sites. In addition, surface winds at Istres, France were above the flight rule limits. The TAL forecast update at 1348 UTC provided the Flight Director with one TAL site (Moron) with acceptable weather conditions. Zaragoza was NO-GO due to thunderstorm anvils within flight rule limits and Istres was NO-GO for a 1-knot tailwind violation. Continued development of thunderstorms in the vicinity of Moron created a concern for anvils attached to an active thunderstorm within the flight rule limits. The Moron forecast was updated to NO-GO at 1513 UTC. Launch occurred on-time at 1514 UTC. The RTLS observation at 1539 UTC was GO, and the observations at the TAL abort landing time of 1549 UTC were GO at Moron and Istres. Zaragoza was observed NO-GO due to thunderstorms (anvil) within 20 nautical miles of the airfield.

Following the successful installation of the P3/P4 truss and deployment of the solar arrays, End-of-Mission landing was planned for September 20th. However, a cold front was forecast to move into the vicinity of Kennedy Space Center with concerns for thunderstorms, precipitation, ceilings, and crosswinds for the night-time landing. During landing preparations early on the 19th, the crew and Flight Controllers noticed an object orbiting near the orbiter. The Mission Management Team determined later on the 19th to cancel the September 20th landing attempt to allow time to review data on the object. The front moved as anticipated and weather violations occurred on both landing opportunities at KSC on September 20th.

The September 21st landing was uneventful. The cold front that produced the weather violations on the 20th moved into southern Florida on the 21st. High pressure built into the southeast United States and light northeast winds developed over Kennedy Space Center. Some areas of fog developed in the vicinity of Daytona Beach and central Florida, but the forecast and observations for KSC were GO throughout the landing countdown and the astronauts flying weather reconnaissance did not observe any fog in the local area. The Flight Director gave the "GO" for the deorbit burn for the first landing opportunity at KSC. Atlantis landed at 1021 UTC with clear skies, light winds, and good visibility.

SMG's ascent/entry team for STS-115 consisted of meteorologists Tim Garner, Wayne Baggett, Doris Hood, and Tim Oram (training as lead forecaster).

Submitted by: Tim Garner
STS-115 Lead Forecaster
Tim Oram
STS-115 Lead Forecaster (In Training)