

A CASE STUDY: ESA ANSWERS EMERGENCY SUPPORT CALL FOR NASA WITH STK

Solution | Space Missions

Challenge:

When NASA Johnson Space Center anticipated service outages due to an impending hurricane in the region, Artemis, ESA's data relay satellite, was tapped to provide support to Jules Verne, Europe's first Automated Transfer Vehicle (ATV). ESA also needed to utilize Artemis to perform a Debris Avoidance Maneuver for Jules Verne.

Solution:

Engineers operating Artemis from ESA's facility at Redu, Belgium, used AGI software to confirm, via real-time 3D visualization, support to the ATV.

Results:

With the help of AGI software, the mission control team and ground segment support team at the ATV Control Centre at Toulouse and the Artemis Control Centre in Redu successfully provided support to the ATV with just a few hours to prepare. The easy to use software made their reaction time faster, enabled them to automate tasks and mitigated risk.

In September 2008, Benoit Demelenne, head of the TT&C and Spacecraft Operations Unit for Artemis, ESA's data relay satellite, received word that NASA Johnson Space Center was expecting service outages due to the approaching Hurricane Ike, and would have to evacuate the Center. NASA's Tracking and Data Relay Satellite System (TDRSS) had been communicating with Jules Verne, Europe's first Automated Transfer Vehicle (ATV). With TDRSS/ATV communication interruptions anticipated, and a Debris Avoidance Maneuver necessary to keep the ATV out of harm's way, Artemis needed to provide emergency support. ESA's space operations team at Redu, Belgium, used AGI software to confirm the results of their in-house tools via real-time 3D visualization. With just a few hours to prepare, Artemis successfully met its call.



"We use in-house software for satellite links and intervisibility, but we wanted to find something more user-friendly to share in real time what is happening with Artemis," Demelenne said. "STK showed the 3D orbit of the ATV around the Earth and inter-satellite communications between the ATV and Artemis in real time. Using AGI tools provided great visibility into what should take place in orbit."

Demelenne has been using AGI software at ESA since 1998, and says one of the key benefits is how easy it is to use. "It is not being used by flight dynamics experts. We find it provides very quick access to important information for mission analysis." ESA uses STK Professional Edition for access calculations and link and budget analysis, and STK/Integration to automate inter-satellite visibility. "STK serves as great quality control and makes us more confident running our real-time operations. It saved us time and mitigated risk, and we anticipate it will be a benefit in many other mission operation analyses."

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— Benoit Demelenne, ESA



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