Features of the Deployed NPOESS Ground System

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Abstract

The National Oceanic and Atmospheric Administration (NOAA), Department of Defense (DoD), and National Aeronautics and Space Administration (NASA) are jointly acquiring the next-generation weather and environmental satellite system; the National Polar-orbiting Operational Environmental Satellite System (NPOESS). NPOESS replaces the current Polar-orbiting Operational Environmental Satellites (POES) managed by NOAA and the Defense Meteorological Satellite Program (DMSP) managed by the DoD. The NPOESS satellites carry a suite of sensors that collect meteorological, oceanographic, climatological, and solar-geophysical observations of the earth, atmosphere, and space. The ground data processing segment for NPOESS is the Interface Data Processing Segment (IDPS), developed by Raytheon Intelligence and Information Systems. The IDPS processes NPOESS satellite data to provide environmental data products (aka, Environmental Data Records or EDRs) to NOAA and DoD processing centers operated by the United States government. The IDPS will process EDRs beginning with the NPOESS Preparatory Project (NPP) and continuing through the lifetime of the NPOESS system. The command and telemetry segment for NPOESS is the Command, Control and Communications Segment (C3S), developed by Raytheon Intelligence and Information Systems. C3S is responsible for managing the overall NPOESS mission from control and status of the space and ground assets to ensuring delivery of timely, high quality data from the Space Segment (SS) to IDPS for processing. In addition, the C3S provides the globally distributed ground assets

necessary to collect and transport mission, telemetry, and command data between the satellites and the processing locations. The C3S provides all functions required for day-to-day commanding and state-of-health monitoring of the NPP and NPOESS satellites, and delivery of SMD to each Central IDP for data products development and transfer to System subscribers. The C3S also monitors and reports system-wide health and status and data communications with external systems and between the NPOESS segments.

The NPOESS C3S and IDPS ground segments have been delivered and transitioned to operations for NPP. C3S was transitioned to operations at the NOAA Satellite Operations Facility in Suitland Maryland in August 2007 and IDPS was transitioned to operations in July 2009. Both segments have been involved with several compatibility tests with the NPP Satellite at the Ball Aerospace Technology Corporation (BATC) factory. The compatibility tests have involved the spacecraft bus and the four sensors, VIIRS, ATMS, CrIS and OMPS. The tests have involved both the ground segments flowing data between the NSOF and the BATC factory and flowing data from the polar ground station located at Svalbard over high speed links back to the NSOF and the two located and NESDIS and AFWA. This poster will describe the NPOESS ground architecture features and enhancements for the NPOESS timeframe. These features and enhancements include C3S provided space to ground connectivity, reliable and secure data delivery and insight and oversight of the total operations. For NPOESS the ground segment architecture is extended to provide additional ground receptor Sites to reduce data product delivery times to users. This ground segment architecture is extended to provide delivery of additional sensor data products from sensors similar to NPP and more NPOESS sensors. This architecture is also extended from two Centrals (NESDIS and AFWA) to two additional Centrals (FNMOC and NAVO), While the ground segment architecture is extended and enhanced for NPOESS, IDPS acts as a buffer minimizing changes in how users request and receive data products.

Bibliography

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