NPOESS C3 Segment

www.npoess.noaa.gov

Command, Control, and Communications (C3)

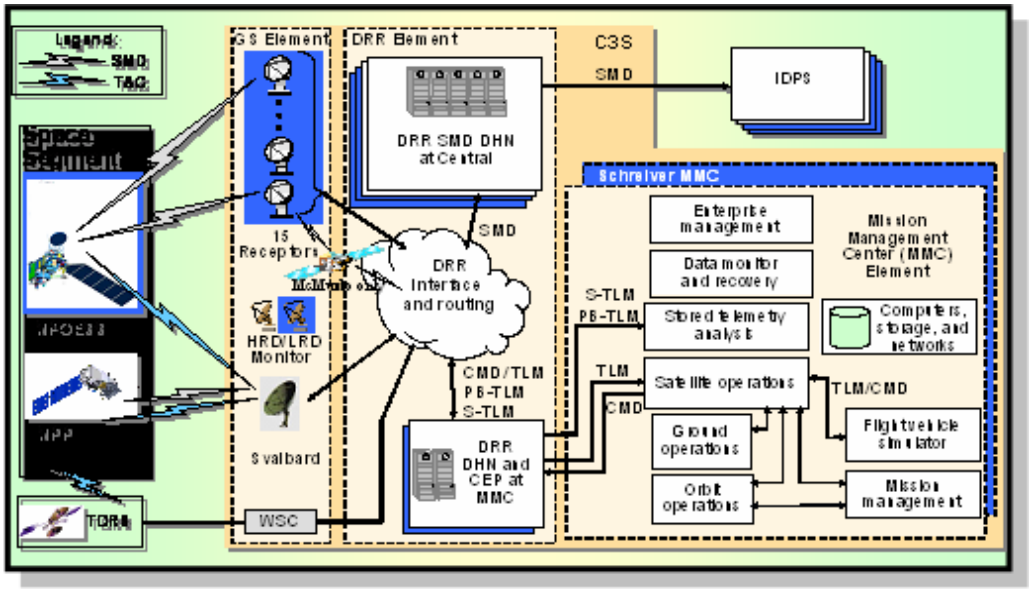
The NPOESS Command, Control and Communications Segment (C3S) consists of ground stations which provide ground to space connectivity, primary and alternative mission management centers, and network communication elements.

SvalSat Ground Station, Norway

NPOESS C3 functions encompass mission planning, enterprise management, antenna resource scheduling, satellite operations, anomaly resolution, system security, relay of data to and from central users, and spacecraft & sensor engineering. The C3S also supports other activities of the program that include the launch and early-orbit checkout phases.

C3S provides reliable operations infrastructure with a clear path for growth as well as pre-planned product improvements.

The NPOESS C3 Segment combines many technologies into a single program for the first time. SafetyNet™, a Northrop-Grumman patent-pending concept, uses a world-wide, high speed, high reliability commercial fiber optic communication network to connect 15 receptors, enabling NPOESS product latencies of less than 28 minutes for 95% of the mission data. For security and performance, NPOESS network links use Multi-layer Protocol Label Switching (MPLS) and Internet Protocol Security (IPSec) Virtual Private Networks (VPNs) to protect data, and reliable multicast technology to save routing costs. The mission management center provides complete control and status of all NPOESS ground and space assets. NPOESS Preparatory Project (NPP) and NPOESS blaze the trail in combining the Consultative Committee for Space Data Systems (CCSDS) standard with encryption to comply with international space standards as well as US Information Assurance policy.



Command, Control, and Communications Overview

Key C3S Elements

The Ground Station Element provides ground to space connectivity for NPOESS through a world-wide network of receptors for NPOESS mission data, SvalSat for NPP mission data, and a combination of the TDRSS Space Network and SvalSat ground antennas at Svalbard, Norway for Telemetry and Commanding. NPOESS resources are operated in accordance with various international agreements and treaties between the U.S. and host nations.

The Data Routing and Retrieval Element (DRR) provides all NPOESS inter-segment communications using secure transport methods and the latest in network security technology. The DRR will provide routing for commands and telemetry between the Mission Management Centers (MMCs) and ground stations, routing of data from the Ground Stations to the Interface Data Processing Segment (IDPS), and other communications between NPOESS resources.

The Mission Management Center (MMC) Element provides the tools necessary to effectively manage the entire NPOESS mission. The MMC provides insight and oversight of the entire system's operations, from mission planning, to control of space and ground assets, to monitoring and assessing system performance. The NSOF will host the Flight Vehicle Simulator, (FVS), which provides a high fidelity simulation of the spacecraft and its sensors, utilizing flight-like hardware for the critical elements. The FVS will be capable of executing scenarios for training, emergency procedures, checkout, and anomaly resolution efforts. The FVS will also be used for ground software testing and certification.

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