NOAA and NASA are jointly acquiring the next-generation civilian operational weather and environmental satellite system, the Joint Polar Satellite System (JPSS). JPSS will contribute the afternoon orbit component and ground processing system to replace the current Polar-orbiting Operational Environmental Satellites (POES) managed by NOAA and the ground processing component of the POES. The JPSS satellites will carry a suite of sensors designed to collect meteorological, oceanographic, climatological, and polar geophysical observations of the earth, atmosphere, and space. The ground processing system for JPSS, known as the Common Ground System (JPSS CGS), provides command, control, communications, data processing and product delivery. The CGS currently flies the Suomi National Polar-orbiting Partnership (S-NPP) satellite and, with the design and processes S-NPP mission data to provide Environmental Data Records (EDRs) to NOAA and NRO processing centers operated by the U.S. government, generating multiple terabytes per day across more than two dozen environmental data products. New Space Link Extension (SLE) capable ground hardware will provide a standardized and reliable data delivery interface. Implementation of CCSDS Standardized Space Link Extension (SLE) data delivery protocol for JPSS Stowed Mission Data and Low Rate Telemetry provides benefits such as a new interface using TCP/IP guaranteed data delivery protocol (which reduces the number of ground recoveries and chance of data loss) and a standard interface allowing easy integration of new SLE-compliant COTS with minimal-to-no NRE required from the COTS supplier. Upgrade features such as the new, flexible architecture which facilitates multimission capabilities that offer significant opportunities for cost reduction and improved information integration across missions.

**JPSS CGS Space-Ground Communications Node (SGCN) Conceptual Architecture**

**JPSS CGS-Space Ground Communications Node (SGCN) Overview**

**JPSS CGS-Surface Ground Command and Control System (CGS CGS)**

**JPSS CGS Global Ground Station Architecture**

**JPSS CGS Worldwide Communications Lines**

**JPSS CGS-Space Link Extension (SLE)** data delivery protocol for Stowed Mission Data and Low Rate Telemetry; Benefits:

- New SLE interface utilizes TCP/IP guaranteed data delivery protocol reducing number of ground recoveries and chance of data loss
- Standard interface allows easy integration of new SLE compliant COTS with minimal to no NRE required from the COTS supplier

**New C3S Design Benefits**

- **Improved system availability**
- **Reduced downlink interference**
- **Satisfied COOP requirements**
- **Simplified maintenance upgrades**
- **Removal of 2 SW subsystems simplifies long-term maintainability**
- **Increased reliability via HW COTS solution**
- **Simplified data routing and retrieval**
- **SLE protocol provides enhanced status delivery**
- **Ease future mission integration due to industry standard design**

**SLE Global Data Flow**

**SLE Downlink Conceptual Architecture**

**JPSS CGS-Space Link Extension (SLE)** data delivery protocol for Stowed Mission Data and Low Rate Telemetry; Benefits:

- **Increased system availability**
- **Reduced downlink interference**
- **Satisfied COOP requirements**
- **Simplified maintenance upgrades**
- **Removal of 2 SW subsystems simplifies long-term maintainability**
- **Increased reliability via HW COTS solution**
- **Simplified data routing and retrieval**
- **SLE protocol provides enhanced status delivery**
- **Ease future mission integration due to industry standard design**

**Verifying that: the 3.5 Mbps data transfer service for JPSS SLE is fully operational capable, redundant, and able to support at least 24 channels**

**JPSS CGS-Space Link Extension (SLE)** data delivery protocol for Stowed Mission Data and Low Rate Telemetry; Benefits:

- **Increased system availability**
- **Reduced downlink interference**
- **Satisfied COOP requirements**
- **Simplified maintenance upgrades**
- **Removal of 2 SW subsystems simplifies long-term maintainability**
- **Increased reliability via HW COTS solution**
- **Simplified data routing and retrieval**
- **SLE protocol provides enhanced status delivery**
- **Ease future mission integration due to industry standard design**

**Success of Block 2.0 Prototyping Activities**

- **T&c AGS CCSDS Space Link Extension (SLE)** protocol testing
- **Reliable SLE Data Transfer System Redesign Right on!**

**Copyright © 2014 Raytheon Company. All rights reserved**