Fact Sheet

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NORTHROP GRUMMAN

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National Polar-orbiting Operational Environmental Satellite System (NPOESS)

System Description:

The nation's next-generation operational, polar-orbiting environmental satellite system, NPOESS is composed of satellites, a ground control system and a data processing/dissemination network. Initially two NPOESS satellites, each equipped with different sensor configurations, will orbit Earth in separate orbital planes and two additional satellites may be added at a later date. The system will be augmented by data from the European Meteorological Operational (METOP) satellites provided by the European Organization for the Exploitation of Meteorological Satellites. Nine advanced sensors, some new, some improvements on existing sensors, are currently being designed and built by teams of domestic and international companies and will be integrated onto the NPOESS satellites.

NPOESS satellites will downlink stored mission data to 15 globally distributed, receive-only Ka-band ground receptor sites at 150 megabits per second (Mbps). The receptors are interconnected and linked to data processing centers in the continental United States by commercial fiber optic networks; the centers process the raw data and send it to users. The receptors form a portion of the command, control and communications segment (C3S) known as "SafetyNet." SafetyNet ensures the delivery to Weather Centrals of 77 percent of raw data gathered by the satellites in less than 15 minutes, compared to the two to three hours or more it takes for legacy systems.

Another important capability of the NPOESS architecture is support of fixed and mobile field terminals deployed aboard ships, at military bases, in theaters of operation, and at educational and scientific institutions. Field terminals will receive and process either high- or low-rate data directly from NPOESS and other environmental remote sensing satellites, and will produce data products for specific user needs. NPOESS will transmit high-rate data in the X-band at 20 Mbps and low-rate date in the L-band at about 4 Mbps.

The C3S manages the overall mission, including active operation and accounting of mission data, delivery of sensor data to the Interface Data Processing Segment (IDPS), and satellite command and

control. The IDPS features high-speed symmetric multi-processing computers to convert streams of sensor data into weather products at four weather centrals in the U.S. The software developed for IDPS will be configured and provided to Field Terminal users worldwide, for their processing of the high rate and low rate direct broadcast data. A flexible software architecture manages the algorithmic processing that produces weather maps and data, supporting forecasting, scientific research and tactical users.

Serving civilian, military and scientific communities, NPOESS will produce 39 separate environmental data records including regional and global meteorological data; oceanographic, environmental, climatic, and space environmental remote sensing information; surface data collection and search and rescue capabilities. Among the many benefits, NPOESS will help civilian forecasters reduce potential damage to life and property from severe weather conditions; will help the military to anticipate and exploit atmospheric conditions in operations planning; and will provide seasonal to inter-annual weather and climate forecasting.

Customer:

● NPOESS Integrated Program Office (IPO)

The NPOESS IPO is a tri-agency program consisting of representatives from the National Oceanic and Atmospheric Administration (NOAA), Department of Defense and NASA.

Contract Details:

● Build, integrate, launch, operate and maintain two NPOESS satellites with an option for two additional satellites. The contract also includes products and operation and support to the associated NPOESS Preparatory Project (NPP) satellite.

● Northrop Grumman is the prime contractor with responsibility for overall system design and development, system engineering, system integration, operation and support, acquisition of instruments and assembly and test of the spacecraft.

● Raytheon is providing the ground system for NPOESS, including the Command, Control, Communications Segment (C3S), the Interface Data Processing Segment (IDPS) and system engineering support.

Background Data:

NPOESS converges NOAA's Polar-orbiting Operational Environmental Satellite program and DoD's Defense Meteorological Satellite program into a single satellite system that will satisfy the nation's critical civil and national security requirements for space-based, remotely sensed environmental data. The most significant change in U.S. operational remote sensing since the launch of the nation's first weather satellite in 1960, NPOESS will significantly improve weather forecasting and climate

prediction. NPOESS will go beyond legacy systems to meet additional civilian requirements, such as increased sensitivity in moisture and temperature profiles, as well as additional military requirements, such as increased imagery, data availability and data access.

Northrop Grumman will build and integrate two satellites for the space segment. The spacecraft bus is similar to the Aqua and Aura remote sensing spacecraft built and integrated by Northrop Grumman for NASA's Earth Observing System program. The spacecraft bus features a "plug and play" design that eases sensor integration and houses different sensor types with simplified payload accommodation interfaces. NPOESS will benefit from the knowledge and experience Northrop Grumman has gained in integrating sensors on to Aqua and its sibling Aura.

Northrop Grumman has been involved in the development of remote sensing instruments and spacecraft for NASA and international customers for several decades. In addition to Aqua and Aura, Northrop Grumman built the Total Ozone Mapping Spectrometer-Earth Probe, Republic of China Satellite-1, and the Korean Multipurpose Satellite.

The company has also built remote sensing instruments including Hyperion, the first hyperspectral imager to orbit Earth as part of NASA's New Millennium program, and two generations of instruments to study the Earth's radiation budget, Earth Radiation Budget Experiment and Clouds and the Earth Radiation Energy System.

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