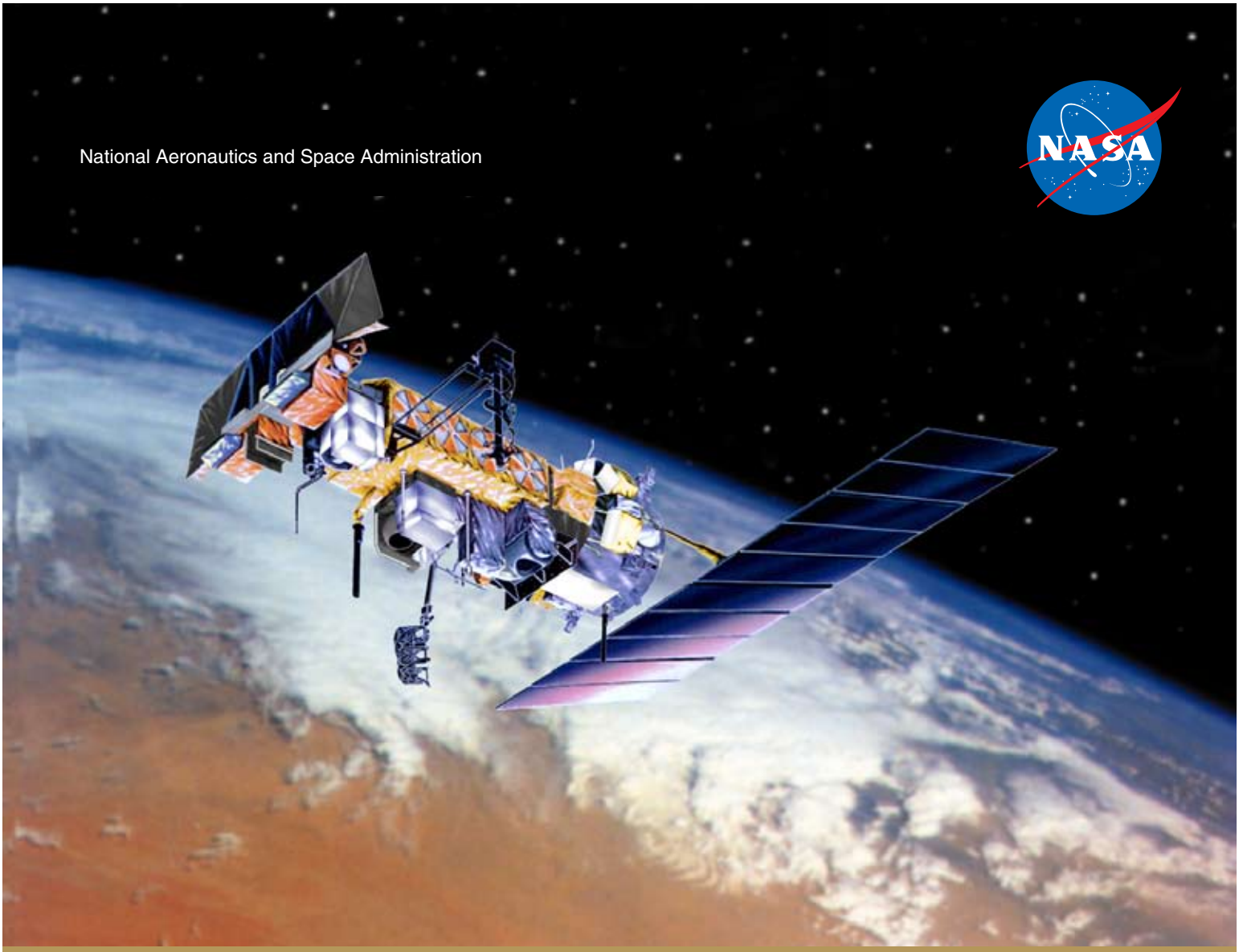
National Aeronautics and Space Administration



Press Kit

Feb. 2009

NOAA-N Prime Launch

www.nasa.gov

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NOAA-N Prime is scheduled to launch at 5:22 am EDT (2:22 am PST) on February 4, 2009 from the Western Test Range at Vandenberg Air Force Base, Calif.

NASA News Center/AIM Status Reports

The NASA NOAA-N Prime News Center at Vandenberg Air Force Base will open on L-2 days and may be reached at 805-605-3051. Recorded status reports will be available beginning on L-5 days at 805-734-2693.

Launch Media Credentials for Vandenberg Air Force Base

Accreditation requests to cover the prelaunch press conference and the launch of NOAA-N Prime may be made through the 30th Space Wing Public Affairs Office at 805-606-3595.

NASA Television Information

The prelaunch press conference and mission science briefing will begin at 4 pm. EST (1 pm PST) on February 2. Launch coverage will begin at approximately 2 hours before launch and will continue through spacecraft separation.

In the continental United States, NASA Television is carried by an MPEG-2 digital C-band signal on AMC-6, at 72 degrees west longitude, Transponder 17C, 4040 MHz, vertical polarization. In Alaska and Hawaii programming is on an MPEG-2 digital C-band signal accessed via satellite AMC-7, transponder 18C, 137 degrees west longitude, 4060 MHz, vertical polarization.

A Digital Video Broadcast compliant Integrated Receiver Decoder is required for reception. Analog NASA TV is no longer available.

NASA TV audio of AIM events will be available on the “V” circuits that may be reached by dialing: 321-867-1220, -1240, -1260, - 7135.

For NASA TV information and schedules, visit: http://www.nasa.gov/ntv

Internet Information

More information the NOAA-N Prime mission, including an electronic copy of this press kit, press releases, fact sheets, status reports, animations, and photos can be found at:

http://www.nasa.gov/noaa-n-prime
http://www.osd.noaa.gov/POES/noaa_n_prime.htm
http://nws.noaa.gov

Prelaunch L-14 Media Briefing was held by telecon on January 22, 2009.

Prelaunch L-2 Media press conference and mission briefing will be carried live on NASA Television beginning at 4 pm. EST (1 pm PST) on February 2 in the Building 840 conference room of the NASA-KSC Resident Office at Vandenberg Air Force Base.

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RELEASE: 09

NASA, NOAA SET TO LAUNCH NOAA-N PRIME SATELLITE

WASHINGTON – NASA is preparing to launch NOAA'S latest polar-orbiting operational environmental satellite, called NOAA-N Prime, providing an essential resource for NOAA's long-range weather and climate forecasts and improving the U.S. search and rescue operations.

NOAA-N Prime is scheduled to lift off from Vandenberg Air Force Base in Calif., on February 4, at 2:22 a.m. PST (5:22 a.m. EST).

"Within the U.S. and around the world there is a growing demand for reliable coverage and accurate data from satellites that can tell what's happening in the environment," said Mary Kicza, assistant administrator for NOAA's Satellite and Information Service. "Launching NOAA N Prime will help meet the demand."

As it orbits the Earth, NOAA-N Prime will collect data about the Earth's surface and atmosphere that are vital inputs to NOAA's long-range Earth weather and climate outlooks, including forecasts for El Nino and La Nina. NOAA-N Prime has imaging and sounding capabilities that are broadcast around the world and recorded on board for playback over the NOAA and European Organisation for the Exploitation of Meteorological Satellite ground stations. Space weather instruments provide data useful for warnings of solar winds that may impair communications, damage satellites and power systems, and affect astronaut safety.

NOAA-N Prime has instruments that support the Search and Rescue Satellite-Aided Tracking System (SARSAT), part of the international satellite system that includes the Russian provided satellites (COSPAS). Since SARSAT was established in 1982, NOAA polar-orbiting satellites have been detecting emergency distress beacons set by aviators, mariners and individuals in remote locations and relaying them to ground stations so that rescue teams may be dispatched. More than 24,500 lives have been saved through the satellite based Search and Rescue system to date.

NOAA-N Prime is the sixteenth and last satellite in a series of polar-orbiting satellites dating back to 1978. A new generation of environmental satellites called the National Polar Operational Environmental Satellite System (NPOESS) will become operational after the POES satellites complete their mission. NPOESS is a tri-agency (NOAA, Department of Defense, NASA) program. NPOESS will provide more capable sensors for improved data collection and better weather forecasts beginning in 2013.

"NASA is proud of our many years of successful collaboration with NOAA in building and launching these polar orbiting satellites", stated Wayne McIntyre, the NASA NOAA-N Prime Project Manager. The success of this mission will provide a healthy polar constellation for continuous data products until the follow-on program launches."

NOAA-N Prime will replace NOAA-18 in a 2:00 p.m. local solar time orbit as the primary afternoon spacecraft. NOAA-N Prime will carry the same primary instruments as NOAA-18 plus an Advanced Data Collection System and an improved Search and Rescue Processor provided by France. NOAA-N Prime will be renamed NOAA-19 after achieving orbit.

NOAA manages the polar-orbiting operational environmental satellite program and establishes requirements, provides all funding and distributes environmental satellite data for the United States. NASA's Goddard Space Flight Center in Greenbelt, Md., procures and manages the development and launch of the satellites for NOAA on a cost reimbursable basis.

Twenty-one days after it is launched, NASA will transfer operational control of NOAA-19 to NOAA. NASA's comprehensive on-orbit verification period is expected to last approximately 45 days after launch.

For more information about NOAA-N Prime and the polar orbiting satellites, see the following web sites:

http://www.nasa.gov/noaa-n-prime
http://www.osd.noaa.gov/POES/noaa_n_prime.htm
http://nws.noaa.gov

NOAA-N Prime Quick Facts

NASA and NOAA have jointly developed the polar-orbiting series of satellites. These Advanced TIROS-N (ATN) spacecraft (named after the prototype satellite, TIROS-N, (Television Infrared Observation Satellites) have been flying since 1978. The NOAA satellites carry seven scientific instruments, two search and rescue instruments and a data recording system. NOAA-N Prime is the latest satellite in the ATN series built by Lockheed Martin Space Systems Company.

Spacecraft

Dimensions: Main body - 4.2 meters (13.75 feet) long, 1.88 meters (6.2 feet) diameter;
Solar array: 2.73 meters by 6.14 meters (8.96 feet by 20.16 feet); 16.76 square meters (180.63 square feet)
Science Instruments: Advanced Very High Resolution Radiometer/3 (AVHRR/3); High Resolution Infrared Radiation Sounder (HIRS/4); Advanced Microwave Sounding Unit A (AMSU-A); Microwave Humidity Sounder (MHS); Solar Backscatter Ultraviolet Radiometer/2 (SBUV-2); Space Environment Monitor/2 (SEM/2); Advanced Data Collection System (DCS/2);
Search and Rescue Instruments: Search and Rescue Repeater and Search and Rescue Processor
Recorder system: Digital Data Recorder (DDR)
Power: solar array; three nickel-cadmium batteries each consisting of two battery packs
Load Power Requirements: 833 watts for zero degrees sun angle; 750 watts for 80 degrees sun angle
Instrument Data Rate: 665.4 kilobits per second
Design Lifetime: greater than two years

Launch Vehicle

Type: Delta II 7320-10C Space Launch Vehicle, Boeing Satellite Systems
Weight at Liftoff: ~1419.8 kilograms (3,130pounds); Weight includes 4.1 kilograms of expendable fuel (9 pounds)

Mission

Launch Date: February 4, 2009
Launch Time: 5:22 a.m. EST (2:22 a.m. PST)
Launch Window: 5:22 a.m. to 5:32 a.m. EST (2:22 a.m. to 2:32 a.m. PST)
Launch Site: Western Test Range, SLC-2W, Vandenberg Air Force Base, Calif.
Orbit: 464 nautical miles (860 kilometers)
Inclination: 98.73 degrees to the equator
Total Orbital Period: 102.14 minutes; sunlight period, 72 minutes average; Earth shadow period, 30 minutes average
Spacecraft Separation from Stage 2: T+ 3940 seconds once the required attitude and attitude rates have been achieved
First Acquisition of NOAA-N Prime Signal: 30 minutes after launch at the McMurdo Tracking Facility

Program Cost

The total cost for the NOAA N Prime spacecraft, instruments, launch vehicle and the technical management support is $564M. This includes the cost for the 14 month delay of the launch date to February 2009. This mission is funded through NASA by NOAA on a cost reimbursable basis.

Q What is the Polar Operational Environmental Satellite (POES) program and what is NASA's role?

A Since the 1960s, NASA has developed the Polar Operational Environmental Satellites (POES) for the National Oceanic and Atmospheric Administration (NOAA). NOAA-N Prime, the latest NOAA spacecraft, is scheduled for launch in early 2009. NOAA manages the POES program and establishes requirements, provides all funding and distributes environmental satellite data for the United States. NASA's Goddard Space Flight Center in Greenbelt, Md., with responsibilities delegated by NASA's Science Mission Directorate, procures and manages the development and launch of the NOAA satellites for NOAA on a cost reimbursable basis.

Q What is the mission of the POES Program and NOAA-N Prime?

A The NOAA satellites carry instruments that observe our Earth and provide global data for NOAA's operational user requirements including short-, medium-and long-range weather forecasts. The two polar-orbiting satellites track global weather patterns affecting the weather and climate of the U.S. and the world. Scientists use the polar orbiters' sensors to measure ozone levels in the atmosphere and are able to detect the ozone holes.

Scientists utilize the NOAA operational products in their Earth science research. They also develop new methodology to analyze the satellite data to produce new and/or improved satellite products.

The satellites send millions of global measurements daily to NOAA's Command and Data Acquisition stations in Fairbanks, Alaska, and Wallops Island, Virginia, and the European Organisation for the Exploitation of Meteorological Satellites' (EUMETSAT) station at Svalbard, Norway. These data are sent to NOAA's data processing center in Suitland, Maryland, adding valuable information to forecasting models, especially for ocean areas, where conventional ground-based data are lacking.

Q What are the key objectives of the POES mission?

A The objectives of this mission are to collect and disseminate worldwide meteorological and environmental data.

The satellite system provides (1) imaging and quantitative measurements of the Earth's atmosphere, its surface, and cloud cover. This information includes natural radiation leaving the Earth's atmosphere, atmospheric ozone distribution, sea and land surface temperatures, vegetation health and coverage, vertical temperature profiles through the stratosphere, and water vapor profiles in the troposphere; (2) measurement of proton and electron flux at orbit altitude; (3) remote platform data collection. It also includes a Search and Rescue Satellite-aided Tracking (SARSAT) system. SARSAT is part of an international satellite system for search and rescue, which includes NOAA spacecraft and the Russian provided satellites (COSPAS). The system consists of the satellites and an international network of Earth stations, which provide global distress alert and location information to appropriate rescue authorities. The goal of this humanitarian effort is to reduce the time required to rescue air and maritime distress victims and thereby significantly increase their chances for survival.

Q What are the main messages the public should know about the program and NOAA-N Prime?

A

- The NOAA polar-orbiting satellites have collected data for most of the past 50 years enabling scientists and researchers to accumulate the most extensive picture of climate change. A stunning library of climate data has been gathered to aid in environmental studies such as climate change studies, vegetation monitoring, biomass burning, El Niño, pollution, and sea ice tracking.

- These satellites collect data needed for weather forecasting and other environmental uses. The data from these satellites are critical for weather prediction. The data in weather models that help let the public know if it will rain in the next few days, whether a sweater will be needed, and if outdoor activities are reasonable. The satellites provide warnings for bad weather and help farmers decide when to plant their crops, and let construction crews decide when to pour cement. These satellites also monitor the near space environment and provide data to the airline industry about disruptive atmospheric conditions, allowing them to change their flight plans due to times of potential high radiation.

- Long-term data is used to study vegetation growth and advise farmers as to where and when to plant crops; ocean currents for fishing and navigation; and to monitor natural disasters such as volcanic eruptions, fast moving fires and the progress of flood waters.

- The NOAA polar-orbiting satellites are the "workhorse" of the National Weather Service and are the only satellite program to be sanctioned by the U.S. Congress.

- NOAA-N Prime will also join the other polar-orbiting satellites by detecting emergency distress beacons set by aviators, mariners, individuals in the wilderness, etc. and relay them to the ground so that emergency response will be dispatched. More than 24,500 lives have been saved through the satellite based Search and Rescue system to date.

Q What are the NOAA-N Prime instruments and what do they do?

A The NOAA-N Prime instruments perform the following:

Advanced Very High Resolution Radiometer (AVHRR): will provide day and night information, at 1.131 kilometer (.703 mile) spatial resolution. The imagery helps determine cloud cover distribution and cloud type, cloud top temperature, ice/snow melt, and sea surface temperature, and vegetation health and coverage.

High Resolution Infrared Sounder (HIRS4) and Advanced Microwave Sounding Unit A (AMSU): will provide vertical temperature and moisture profiles of the atmosphere. This instrumentation also provides land and ocean surface skin temperature, cloud products, earth radiation products, precipitation, and ozone distribution.

Microwave Humidity Sensor (MHS): measures the liquid water content in the atmosphere. The MHS is provided by EUMETSAT. It provides snow cover, atmospheric moisture profiles, precipitation rate, and type information.

Solar Backscatter Ultraviolet-2 (SBUV-2): that provides ozone profile measurements during the day.

Space Environmental Monitor (SEM-2): will measure proton and electron density to measure the earth's magnetic field and provide solar storm warnings.

Search and Rescue Repeater (SARR) and Search and Rescue Processor (SARP-3): will provide Search and Rescue capabilities.

Data Collection System (DCS): will collect environmental data from stationary platforms in remote locations, and free-floating platforms on buoys, balloons, and migratory animals.

Q How does NOAA-N Prime differ from the previous satellites? Are there any first time instruments or ones that have been substantially improved? What do those changes mean to the public?

A NOAA-N Prime carries an Advanced Data Collection System (ADCS) and improved Search and Rescue processor (SARP-3), both of which were provided by France. The ADCS now has transmitted capability to send signals to platforms on the ground to do such things as turn them off to conserve power or otherwise modify the beacon's performance. The spacecraft also has a new deployable antenna for the ADCS called the ADCS Deployable Antenna (ADA) located near the solar array end of the spacecraft. NOAA-N Prime carries an improved version of the SARP-2 406 MHz processor designated SARP-3. This unit has improved performance in system capacity, bandwidth, and protection against interference.

A The SAR instruments are part of the international COSPAS-SARSAT system (http://www.cospas-sarsat.org/) designed to detect and locate Emergency Locator Transmitters (ELTs), Emergency Position Indicating Radio Beacons (EPIRBs), and Personal Locator Beacons (PLBs) operating at 121.5 MHz, 243 MHz, and 406 MHz. Starting in February 2009 the 121.5 MHz and 243 MHz beacons will no longer be supported by the COSPAS-SARSAT system and are not expected to be activated on the NOAA-N Prime spacecraft. PLBs are portable units that are designed to be carried by a person and must be activated manually. Some newer PLBs allow Global Positioning System (GPS) units to be integrated into the distress signal so that you can be located within 100 meters as opposed to within 2-3 miles. To learn more about this very successful international search and rescue system please visit the http://www.sarsat.noaa.gov/ web site.

Q How does the Advanced Data Collection System (DCS) collect environmental data from migratory animals? What types of animals are used and in what locations in the world?

A The Argos Data Collection System (DCS) processes and disseminates environmental data received from fixed and mobile platforms from anywhere in the world. Argos is a joint program of the French Space Agency, the National Aeronautics and Space Administration, and the National Oceanic and Atmospheric Administration. A Memorandum of Understanding signed in 1974 and extended in 1986 defines each partner's responsibilities.

A The DCS is flown on all of NOAA's polar-orbiting satellites, TIROS-N, and NOAA-A through N-Prime. An Argos Platform Transmitter Terminal (PTT) is attached to an animal. The terminal transmissions are received by the satellites and sent to ground stations and processing stations, where the data are retrieved, processed (primarily for location information), and distributed to users. The Argos system is routinely used for tracking such terrestrial animals as bear, caribou, elephants and birds, and marine species like the whale, dolphin, turtle, and basking shark. Miniaturized transmitters allow Argos to track migratory birds such as storks, swans, cranes and geese, The system is also used to monitor the habits of endangered species such as Peregrine falcons and manatees.

A Transmitters utilized by the DCS are available in many sizes with the smallest weighing 25 grams (0.8 ounce) and

operating at a low power of 20-40 milliwatt. Various sensors may be attached to the transmitter. This variety of transmitter capability allows wildlife researchers to study the migration and physiology of such animals as caribou, ibex, camel, dugong, whale and various birds. Doppler measurements on the uplink signal provide location while data embedded in the signal provides environmental information. The satellite system, providing global coverage, allows access to any of the animal habitats.

Argos data is processed and made available to users in the United States by Service Argos, Inc., a not for profit private company.

Q What Polar Operational Environmental Satellites are currently operational?

A There are two operational polar orbiting satellites: MetOp-A is operated by our European partners in a mid-morning orbit and NOAA-18, launched on May 20, 2005, into an afternoon orbit. NOAA-N Prime (19) will replace NOAA-18 in a 2:00 p.m. local solar time orbit as the primary afternoon spacecraft. NOAA-N Prime will carry the same primary instruments as NOAA-18 plus an Advanced Data Collection System and an improved Search and Rescue Processor (SARP3) provided by France. NOAA-N Prime will be renamed NOAA-19 after achieving orbit.

Q How does the POES program differ from the GOES program?

A The POES spacecraft serve as complementary satellites to the Geostationary Operational Environmental Satellites (GOES) system. The GOES satellites provide hourly observations but only over limited areas centered about their equatorial locations. The two GOES satellites provide data from the continental U.S. and Hawaii, and well out into the Atlantic and Pacific Oceans to NOAA forecasters. This is useful for monitoring severe weather and short-term weather prediction. The POES spacecraft provide full global data four times daily which is useful for short-, medium-, and long-range forecast models, climate modeling, and various other secondary missions.

Q What is the history of polar-orbiting project?

A This project was originally known as the Television Infrared Observation Satellites (TIROS). The first TIROS weather satellite was launched on April 1, 1960. By the mid 1970s NOAA and NASA agreed to produce operational TIROS satellites based on the TIROS-N generation of satellites. TIROS-N was launched October 13, 1978 and was the first in the series of operational environmental satellite systems. TIROS-N was a research and development spacecraft serving as a prototype for the operational follow-on series, NOAA-A through NOAA-N-Prime spacecraft. Beginning with NOAA-E, launched in 1983, the basic satellite was “stretched” to permit accommodation of additional research instruments. This became known as the Advanced TIROS-N (ATN) configuration. Some of the additional instruments flown include: Search and Rescue Receiver and Search and Rescue Processor (SARR/SARP); Earth Radiation Budget Experiment, and Solar Backscatter Ultraviolet Spectral Radiometer (SBUV). Three of those instruments, SARR, SARP and SBUV, became part of the operational program. It is important to note that the primary sounding instrumentation has remained essentially unchanged until the addition of AMSU-A & B on NOAA-K and the replacement of the AMSU-B by the MHS on NOAA-N.

Q

Q Engineers build each satellite with a greater than two-year design life and the mean lifetime of each satellite is approximately 3.7 years. However, the instruments are built with a three-year design life. Please explain this rationale.

A Because of the inherent reliability built in and the extensive ground testing prior to launch, this series of satellites has demonstrated performance well exceeding the design lifetime. The satellite design life throughout the series has been two years. The lifetime is a cost/risk tradeoff since more years normally result in a more expensive satellite. To mitigate that risk, the NOAA satellites use the most reliable NASA approved flight parts, Class S, and redundancy in critical subsystem components. The instruments are not redundant, so they are purchased to a three-year design life or more in order to enhance their expected operational reliability.

Q How does NASA use the data obtained from the NOAA-N Prime instruments?

A Data from the NOAA spacecraft are helping NASA scientists design instruments for follow-on missions for NASA's Earth Science Division, within NASA's Science Mission Directorate. NOAA has the responsibility to process, analyze, disseminate, and archive all operational data. These data are made available to NASA researchers and others for research and environmental applications. Scientists are also developing improved methodologies to analyze the data from NOAA- N Prime.

Q What is the impact to NASA and NOAA if the spacecraft does not achieve orbit? What will NOAA do to make up for the loss of operational science data?

A NOAA will lose the additional coverage afforded by having a second satellite in orbit. The polar program will be at greater risk of a total loss of polar satellite data should a serious failure occur in the other operational satellites, MetOp-A and NOAA 18. Older NOAA satellites, including NOAA-16 NOAA-17 and NOAA-15, still have some functioning instruments that could be used if necessary although their orbits have drifted in the years since their launches. MetOp-A is supporting the NOAA and EUMETSAT needs for operational data and services in the morning orbit. MetOp-B is in ground storage and can be launched when needed. The NASA NPP mission is planned for launch in 2010 and the NPOESS C1 is planned for launch in 2013.

Q What happens if some or all of NOAA-N Prime's instruments do not work properly?

A Level 1instruments, critical to the NOAA primary polar mission, are the AVHRR, HIRS, and AMSU-A1. Other NOAA satellites have the same instruments. Typically instruments do not totally fail, but they degrade in performance.

Q What are the plans for the launch of other NOAA Polar-orbiting spacecraft?

A NOAA-N Prime is the last satellite to be launched under the POES program. The next generation of polar orbiting satellites will be known as NPOESS.

Under an agreement with NOAA, the European Organisation for the Exploitation of Meteorological Satellites began operating polar-orbiting satellites known as MetOp in 2006 and they have responsibility for the mid-

morning orbit. The MetOp satellites carry both U.S.-provided and European-developed instruments. The data from these satellites are made available to NOAA as part of the agreement.

A new generation of environmental satellites called the National Polar Operational Environmental Satellite System (NPOESS) will become operational after the POES satellites complete their mission. NPOESS is a tri-agency (NOAA, U.S. Department of Defense, NASA) program. NPOESS will provide more capable sensors for improved data collection and better weather forecasts.

NPOESS will provide long-term systematic measurements of key environmental variables beginning in 2013. In preparation for this NOPESS system, an NPOESS Preparatory Project (NPP) mission will provide risk reduction for this future operational system and it will maintain continuity of certain environmental data sets that were initiated with NASA's Terra and Aqua satellites. NPP will launch in 2010.

Q Previous polar-orbiting satellites were named letters in a series and then numbered on launch. Since NOAA-N was launched in 2005, why isn't this satellite called NOAA-O? What does NOAA-N Prime mean?

A NOAA originally planned to update the current TIROS spacecraft design with the new satellite series NOAA-OPQ. However, after completing a study, NOAA decided to launch only one more satellite, NOAA-N Prime, before the follow on program, NPOESS, begins. The designation NOAA-N Prime was selected since it is the final satellite and will not be part of any future series.

Q There was an accident in the clean room, which involved NOAA-N Prime – what happened to the satellite?

A The NOAA-N Prime spacecraft was damaged in September 2003 when it fell off of a handling cart at Lockheed Martin's Sunnyvale, Calif. plant and hit the floor. Corrective actions were put in place to prevent a similar mishap from occurring in the future. The corrective actions include more training, improved test procedures, more system safety, and more government oversight. NOAA-N Prime was repaired successfully and is ready for launch.

Q What did the repair of NOAA-N Prime cost the government in terms of money and the delays to the launch schedule?

A The cost to rebuild NOAA-N Prime was covered by using the budget for an expected storage period, so no new funding was required between 2004 and 2008. Prior to the accident the planning launch date for N Prime was March 2008; the launch date for N Prime coming out of the rebuild plan was December 2007. As part of the recertification of the NPOESS program in 2006, NOAA agreed to delay the launch of NOAA-N Prime until February 2009.

Earth System Science and Polar Operational Environmental Satellite Program Objectives

Beginning in the 1960s, NASA pioneered the study of the atmosphere from the unique perspective of space with the launch of its Television Infrared Observation Satellite.
Thanks to new satellite and computer technologies, it is now possible to study the Earth as a global system.

Earth System Science integrates many disciplines of scientific research that focus on understanding the planet as a whole, its integral parts and how its parts interact. Through research, scientists are getting better at understanding and improving their forecasting of climate phenomena such as the onset of the 1997-98 El Niño.

Weather and climate prediction is a challenge that requires the collection of data over long periods of time. Climate changes occur over vast ranges of distance and time and their causes and effects are often difficult to measure and understand. Scientists must obtain long-term data if they are to reach a clearer understanding of the interactions among the Earth's many systems. Polar-orbiting satellites provide both long-range weather forecasting and current data for global change research. Operating as a pair, two satellites ensure that non-visible data for any region of the Earth is no more than six hours old.

The NOAA satellites help to carry forth the U.S. commitment to systematic, global weather observation and provide total global coverage four times a day. The mission supports growing international cooperation in space; the spacecraft instrument suite provides data supporting requirements of 140 nations, and several instruments are provided by foreign nations. All nations can access NOAA spacecraft data and for many, NOAA data is their sole weather forecasting reference. In addition to weather observations, the Search and Rescue component of the program makes major contributions toward international search and rescue operations.

The POES program objectives contribute to NASA's exploration objectives of exploring the Earth to gain an understanding of the causes and consequences of long-term climate variations on regional as well as global scales. The POES program objectives support NASA's objectives by providing for distribution of meteorological data to various organizations, improving the capability for forecasting, providing real-time warnings of solar disturbances and by extending our knowledge of the atmosphere and its processes to improve short- and long-term weather forecasts. Data from the NOAA spacecraft are helping NASA scientists design instruments for follow-on Earth science missions. Also, with the data from the POES satellites, NASA scientists are continuing to develop applications that will directly enhance the quality of human life and help to protect the environment.

The POES program disseminates information about the Earth system, expands scientific knowledge by characterizing the Earth system and enables productive use of Earth science products in the public and private sectors.

NOAA-N Prime Mission Overview

NASA will launch and activate the NOAA-N Prime spacecraft, the latest in a series of polar-orbiting spacecraft that provide environmental observations for the National Oceanic and Atmospheric Administration. Part of an active NASA-NOAA cooperative program, the NOAA satellites carry instruments that observe the Earth and provide global data for NOAA's operational user requirements including short-, medium-, and long-range weather forecasts.

NOAA-N Prime is the latest in the series of advanced TIROS-N spacecraft that provide a platform to support the environmental monitoring instruments for imaging and measuring the Earth's atmosphere, its surface and cloud cover. The polar-orbiting spacecraft serve as complementary satellites to the Geostationary Operational Environmental Satellites (GOES) system. Whereas the geosynchronous GOES satellites provide near-term data for the continental United States and Hawaii to NOAA's forecasters, the polar-orbiting spacecraft provide full global data for short-, medium-, and long-range forecast models, climate modeling and various other secondary missions.

Instruments on board the NOAA-N Prime spacecraft monitor the entire Earth, providing atmospheric measurements of temperature, humidity, ozone and cloud images as they track weather patterns that affect global weather and climate. The satellites send millions of global measurements daily to NOAA's command and data acquisition stations in Fairbanks, Alaska, and Wallops Island, Va., and a data processing center in Suitland, Md. These measurements add valuable information to forecasting models, especially for ocean areas, where conventional ground-based data is lacking. The spacecraft also provides a platform for the Search and Rescue Satellite Aided Tracking system, part of the COSPAS-SARSAT constellation. This international search and rescue system detects and locates emergency beacons transmitted from ships, aircraft and people in distress and has aided in saving thousands of lives.

The POES system consists of two satellites that observe every part of the Earth at least twice every 12 hours. Operating as a pair, these satellites primarily provide data for long-range weather forecasting, ensuring that infrared and non-visible data for any region of the Earth are no more than six hours old. The satellites provide global coverage of numerous atmospheric and surface parameters, furnishing quantitative measurements for input to global atmospheric and surface forecast models. Since researchers around the world use these data routinely, the consistency and accuracy of predictions of potentially catastrophic environmental events have improved significantly. Better prediction of these events allows emergency managers to activate plans to reduce their impact and protect life and property. These continuous, overlapping satellite data have provided the foundation for extensive climate and research programs. In many developing countries and over much of the oceans, satellites provide the only source of quantitative information on the state of the atmosphere and of the Earth's surface. This satellite data is an invaluable source of real-time information about severe weather, critical for safety in these remote areas.

The weather data, including images that are often seen on television news programs, affords both convenience and safety to viewers throughout the world.

NOAA-N Prime will operate in a circular, near-polar orbit of 464 nautical miles (860 kilometers) above the Earth with an inclination angle of approximately 98.73 degrees to the Equator. The NOAA-N Prime orbit period, which is the time it takes to complete one orbit of the Earth, will be approximately 102.14 minutes. The sunlight period will average about 72 minutes with approximately 30 minutes in the Earth's shadow. Since the Earth rotates 25.59 degrees during each orbit, the satellite observes a different portion of the Earth's surface during each orbit.

The nominal orbit is Sun-synchronous and rotates eastward about the Earth's polar axis 0.986 degrees per day, approximately the same rate and direction as the Earth's average daily rotation about the Sun. The rotation keeps the satellite in a constant position with reference to the Sun for constant illumination throughout the year.

Launch Vehicle and Launch Orbit Insertion

The NOAA-N Prime satellite will be launched from the Western Range (WR) at Vandenberg AFB, California, by a two-stage Delta II 7320-10 space launch vehicle (SLV). A Boeing Rocketdyne-built RS-27A main engine will power the first stage. Three thrust augmentation graphite epoxy motors (GEMs) built by Alliant Techsystems will provide added boost. The second stage will be powered by Aerojet's AJ10-118K liquid propellant engine. The Delta II second stage engine is restarted in flight and works in conjunction with the Redundant Inertial Flight Control Assembly (RIFCA). This key component, built by L3 Communications Space & Navigation, will provide guidance and control for the rocket. The satellite is enclosed in a 3-m (10-ft)-diameter composite fairing.

The NOAA-N Prime launch and orbit insertion sequence starts with a thrust buildup period following Stage 1 engine ignition. The three GEM motors are ignited approximately 0.2 second before liftoff when main engine thrust has reached the appropriate level. The SLV lifts off and after clearing the launch pad, rolls to its desired flight azimuth. It then begins to pitch over in the trajectory plane. At approximately 264 seconds after liftoff, main engine cutoff (MECO) occurs when the booster propellants are depleted. The control logic then provides a signal that ignites the Stage 2 engine and fires separation nuts to separate it from Stage 1. The payload fairing is jettisoned at approximately T+296 seconds. The second stage burns until the desired orbit is reached at approximately 676 seconds, when an inertial guidance system (IGS)-initiated Stage 2 shutdown is initiated (SECO-1). The launch vehicle performs a reorientation maneuver and coasts until the second stage is restarted at T+3561 seconds. Following a 13-second burn, the second stage is shut down (SECO-2) for the final time. The spacecraft then separates from Stage 2 at approximately T+3940 seconds once the required attitude and attitude rates have been achieved.

History of NOAA's Environmental Satellite System

The first weather satellite in a series of spacecraft originally known as the Television Infrared Observation Satellites (TIROS) was launched on April 1, 1960. By the mid 1970's NOAA and NASA agreed to produce the series operationally based on the TIROS N generation of satellites. TIROS N, a research and development spacecraft serving as a prototype for the operational follow on series, NOAA A through NOAA N Prime was on launched October 13, 1978.

Beginning with NOAA E, launched in 1983, the basic satellite was "stretched" to permit accommodation of additional research instruments. This became known as the Advanced TIROS N configuration. Some of the additional instruments flown include: Search and Rescue; Earth Radiation Budget Experiment, and the Solar Backscatter Ultraviolet spectrometer. Three of those instruments, Search and Rescue Repeater, Search and Rescue Processor and Solar Backscatter Ultraviolet Radiometer, became part of the operational program. The primary sounding instrumentation has remained essentially unchanged until the addition of Advanced Microwave Sounding Units A and -B on NOAA K (15). The Microwave Humidity Sounder replaces the AMSU-B on NOAA-N Prime performing essentially the same science.

The satellite design life throughout the series has been two years. The lifetime is a cost/risk tradeoff since more years normally result in a more expensive satellite. To mitigate that risk, the NOAA N Prime satellite uses the most reliable NASA-approved flight parts, Class S, and considerable redundancy in critical subsystem components. The instruments are not redundant, but they have a three year design life in order to enhance their expected operational reliability. Because of the inherent reliability built in and the extensive ground testing prior to launch, this series of satellites has demonstrated performance well exceeding the design lifetime.

TIROS-N was launched October 13, 1978, and was the first satellite in the fourth generation operational environmental satellite system. TIROS-N was a research and development spacecraft serving as a proto-type flight for the operational follow-on series, NOAA-A through N' spacecraft. The spacecraft was deactivated on February 27, 1981.

NOAA-A (6) was launched June 27, 1979 and was totally deactivated on March 31, 1987, after nearly eight years of operational service.
NOAA-B was launched May 29, 1980, and failed to achieve a usable orbit because of a booster engine anomaly.
NOAA-C (7) was launched June 23, 1981, and was deactivated in June 1986.
NOAA-E (8) was launched March 28, 1983. It was the first of the Advanced TIROS N configuration satellites and it included the first search and rescue package. The satellite was deactivated on December 29, 1985.
NOAA-F (9) was launched December 12, 1984, and was deactivated on February 13,1998.
NOAA-G (10) was launched September 17, 1986, and was deactivated on August 30, 2001.
NOAA-H (11) was launched September 24, 1988. Some instruments are currently in use to a limited degree.
NOAA-D (12) was launched on May 14, 1991, and some instruments and other subsystems continue to operate satisfactorily. NOAA-12 was placed in standby mode on December 14, 1998, when NOAA-15 became operational.
NOAA-I (13) was launched on August 9, 1993, and two weeks after launch, the spacecraft suffered a power system anomaly. Attempts to contact or command the spacecraft since the power failure have been unsuccessful.
NOAA-J (14) was launched on December 30, 1994, and was deactivated on May 23,2007, after more than 12 years of service.
NOAA-K (15) was launched on May 13, 1998, and is a backup satellite with some degraded and failed capabilities.
NOAA-L (16) was launched on September 21, 2000, and is a backup satellite with some degraded capabilities.
NOAA (17) was launched on June 24, 2002, and serves as a backup morning spacecraft with a failed AMSU-A1.
NOAA (18) was launched on May 20, 2005, and currently serves as the operational afternoon satellite. The HIRS performance has been erratic due to a suspect loose lens.

Spacecraft

Lockheed Martin Space Systems Company of Sunnyvale, Calif., built the spacecraft. The instruments onboard NOAA-N Prime include the Advanced Very High Resolution Radiometer/3 (AVHRR/3); High Resolution Infrared Radiation Sounder (HIRS/4); Advanced Microwave Sounding Unit A (AMSU-A); Microwave Humidity Sounder (MHS); Solar Backscatter Ultraviolet Radiometer/2 (SBUV-2); Space Environment Monitor/2 (SEM/2); and an Advanced Data Collection System (ADCS). In addition, it carries two search and rescue instruments: the Search and Rescue Repeater and the Search and Rescue Processor and three Digital Data Recorders.

Instrument Payload and Capabilities

For over 30 years, NOAA has freely and openly provided satellite data through direct broadcast to users in the United States and to all countries throughout the world. In the United States, any commercial firm receiving data through direct readout may provide tailored products to customers and/or viewers. In addition, polar operational environmental satellite data products are made available to users in the United States and throughout the world through NOAA's Satellite Active Archive.

The NOAA polar operational environmental satellites collect global data on cloud cover; surface conditions such as ice, snow, and vegetation; atmospheric temperatures; and moisture, aerosol, and ozone distributions; and collect and relay information from fixed and moving data platforms.

The Advanced Very High Resolution Radiometer/3 is the primary imaging system and consists of visible, near infrared (IR) and thermal IR channels. The primary sounding suite flying on NOAA-N Primeis the Microwave Humidity Sounder (MHS), the High Resolution Infrared Radiation Sounder (HIRS/4) and the Advanced Microwave Sounding Unit-A, which measure atmospheric temperature and humidity. The Solar Backscatter Ultraviolet Radiometer/2 instrument is both an imager and a sounder. As an imager, it produces total column ozone maps. As a sounder, it obtains and measures the ozone distribution in the atmosphere as a function of altitude.

Advanced Very High Resolution Radiometer/3, built by International Telephone and Telegraph-A/CD (Fort Wayne, Ind.), is composed of six detectors: three view reflected energy in the visible portion of the electromagnetic spectrum and three view energy in the near-infrared portion of the electromagnetic spectrum. The Advanced Very High Resolution Radiometer (which is the type of instrument called an "imager") observes vegetation, clouds, and the surface of bodies of water, shorelines, snow, aerosols and ice. It can detect the heat in the environment, the temperature of snowcaps and the sea surface, vegetation growth around the world and forest fires. From this data, scientists on the ground can determine whether snowcaps are growing or diminishing in size, the effects of changes in ocean temperature and other changes in the environment. The instrument has a scan mirror that continuously rotates and scans the Earth at six revolutions per second to provide continuous coverage. Scientists, commercial fisherman, teachers and many others use the data generated by the Advanced Very High Resolution Radiometer worldwide.

High Resolution Infrared Radiation Sounder (HIRS/4), built by International Telephone and Telegraph-A/CD (Fort Wayne, Ind.), is an atmospheric sounding instrument. It observes "columns" in the atmosphere and obtains data from each of 20 segments (or bands) in that column. Each of these 20 bands can be associated with energy from a specific region and height in the atmosphere. By combining the data from the different bands, the instrument can generate complete temperature and moisture profiles. It can also measure how much of the Sun's energy remains as it travels through the atmosphere. The instrument has 19 infrared channels and one visible channel. Each channel takes measurements at a particular frequency that is associated with a particular element (or gas) in the atmosphere. These gases are principally carbon dioxide, water and ozone. These measurements allow scientists to determine the amount of each of these gases in the atmosphere and the altitude at which they appear.

Advanced Microwave Sounding Unit-A, built by Northrop Gruman (Azusa, Calif.,) formerly Aerojet, provides data that is used along with data obtained from the High Resolution Picture Transmission to produce a new suite of microwave-based surface and hydrological products, including global atmospheric temperature and humidity profiles from the Earth's surface to the upper stratosphere, about 48 kilometers or 29.8 miles. Among these products are total precipitable water (water vapor), cloud liquid water, rain rate, snow cover and sea ice concentration. It has 15 channels and continuously scans the Earth's surface and the atmosphere, measuring naturally emitted microwave signals radiated by the Earth's surface and atmosphere. The microwave signals measured by the Advanced Microwave Sounding Unit-A range from 23 gigahertz to 89 gigahertz. The Advanced Microwave Sounding Unit-A is divided into two physically separate modules, each of which operates and interfaces with the spacecraft independently.

Microwave Humidity Sounder (MHS) built by EADS Astrium and donated by the European Oganisation for the Exploitation of Meteorological Satellites (EUMETSAT) (Darmstadt, Germany) is a new instrument for the NOAA series of satellites. It is a five-channel microwave instrument intended primarily to measure profiles of atmospheric humidity. It is also sensitive to liquid water in clouds and so measures cloud liquid water content. Additionally, it provides qualitative estimates of the precipitation rate. The MHS measures the amount of moisture (water) in the atmosphere.

Because of the high variability of atmospheric water, the MHS has a higher resolution than the AMSU-A, with an approximate 16-km (10-mi) diameter circular field of view at nadir. Ninety such fields of view are measured in each cross-track scan. The instrument has approximately the same swath width as AMSU-A but scans across-track in one-third the time so as to keep the two instruments synchronized. By this means, arrays of 3 x 3 MHS samples will overlay each AMSU-A sample, facilitating synergistic use of these instruments.

Space Environment Monitor (SEM-2) originally built by Panametrics (Waltham, Mass.), now Assurance Technology Corporation (Carlisle, Mass).The SEM-2 provides measurements to determine the intensity of the Earth's radiation belts and the flux of charged particles at satellite altitude. It provides knowledge of solar terrestrial phenomena as well as warnings of solar wind occurrences that may impair long-range communications and high-altitude operations, damage satellite circuits and solar panels, or cause changes in drag and magnetic torque on satellites. The SEM-2 consists of two separate sensor units and a common Data Processing Unit (DPU). The sensor units are the Total Energy Detector (TED) and the Medium Energy Proton and Electron Detector (MEPED).

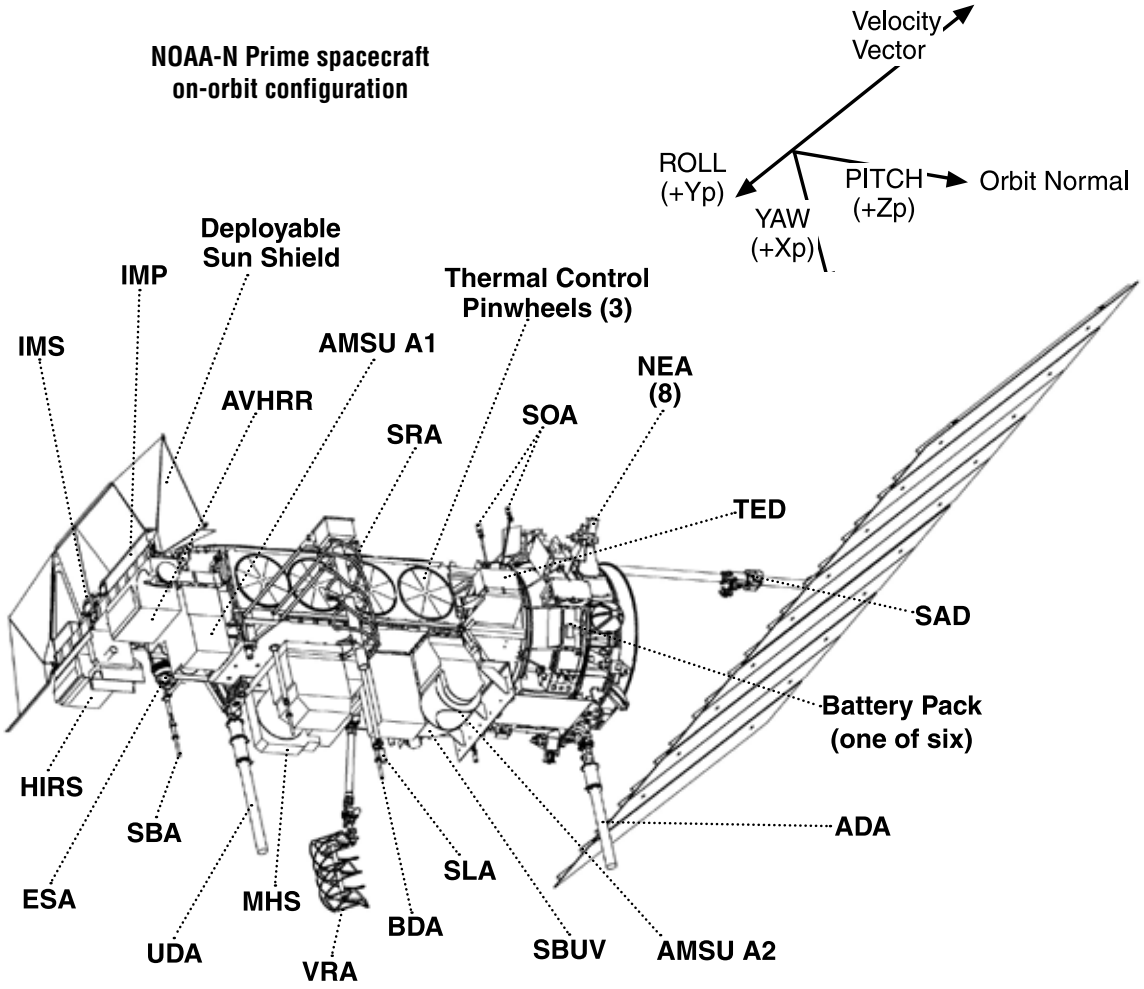
Solar Backscatter Ultraviolet Radiometer/2, built by Ball Aerospace (Boulder, Co.) is flown on the NOAA afternoon satellites. It is a long-term monitoring device that takes global measurements and observes how elements in the atmosphere change over time. The Solar Backscatter Ultraviolet Radiometer uses its 12 channels to measure the amount of radiation (or energy) that comes directly from the Sun (using a diffuser) and how much energy is reflected back from the Earth. This information is integrated into a scientific model that calculates the concentration and distribution of ozone in the stratosphere. However, the primary use of the data from the Solar Backscatter Ultraviolet Radiometer is determining the vertical distribution of ozone over the global surface - how it varies at various distances from the Earth's surface up to approximately 79 kilometers (or 49 miles). The instrument also provides for the generation of layer ozone values, which represent the amount of ozone found in a "chunk" of the atmosphere.

Each channel on the Solar Backscatter Ultraviolet Radiometer detects a particular near-ultraviolet wavelength whose intensity depends on the ozone density at a particular height in the atmosphere. It is nadir pointing, which means that it always points directly toward the center of the Earth and does not scan the atmosphere as the other POES instruments do. The Solar Backscatter Ultraviolet Radiometer has a device called a Cloud Cover Radiometer that provides information on the amount of cloud cover in an image and removes the effects of the clouds from the data.

Advanced Data Collection System provided by CNES in France measures environmental factors such as atmospheric temperature and pressure and the velocity and direction of the ocean and wind currents. Data is collected from transmitting devices on platforms in the form of buoys, free-floating balloons and remote weather stations. Transmitters are even placed on migratory animals, sea turtles, bears and other animals. Data is transmitted to the spacecraft for storage and subsequent transmission from the satellite to the ground. The stored data is transmitted once per orbit. Subsequently, the data is sent to the French Centre at the Centre National D' Etudes Spatiales and the Service Argos Facility in Lanham, Md., for processing, distribution to users and storage for archival purposes.

Search and Rescue instruments on-board NOAA-N Prime consist of a Search
and Rescue Repeater built by Department of National Defense in Canada and a Search and Rescue Processor built by Centre National d'Etudes Spatiales (Toulouse, France). These instruments detect distress calls sent from emergency beacons on-board aircraft and boats and carried by people in remote areas. The instruments on the spacecraft transmit the data to ground receiving stations or local user terminals where the location of the emergency signals is determined by Doppler processing. The Local User Terminals forward the information to a Mission Control Center where further processing of the information occurs. The information is then sent to a Rescue Coordination Center that affects the search and rescue. Since its inception in 1982, the COSPAS-SARSAT system has contributed to saving more than 24,500 lives. The Search and Rescue Repeater accepts signals from emergency ground transmitters at 121.5 MHz, 243 MHz and 406.05 MHz and uptranslates, multiplexes and transmits these signals at L-band to the local user terminals. The Search and Rescue Processor is a receiver and processor that receives 406.05-MHz signals from emergency ground transmitters and demodulates, processes, stores and relays the data to the next local user terminal that is within range of the Search and Rescue Repeater. Only the 406.05 MHZ service will be supported as of February 1, 2009.

Instrumentation Onboard NOAA-N Prime



LEGEND

ADA	ADCS Deployable Antenna	SAD	Solar Array Drive
*ADCS	Advanced Data Collection System	*SARR	Search and Rescue Repeater
		*SARP3	Search and Rescue Processor 3
AMSU	Advanced Microwave Sounding Unit	SBA	S-Band Antenna
		SBUV	Solar Backscatter Ultraviolet Spectral Radiometer
AVHRR	Advanced Very High Resolution Radiometer		
		SLA	Search and Rescue Transmitting Antenna (L-Band)
BDA	Beacon Dipole Antenna		
ESA	Earth Sensor Assembly	SOA	S-Band Omni Antenna (2 of 6 shown)
HIRS	High Resolution Infrared Radiation Sounder		
		SRA	Search-and-Rescue Receiving Antenna
IMP	Instrument Mounting Platform		
IMS	Inertial Measurement System	TED	Total Energy Detector
*MEPED	Medium Energy Proton/Electron Detector	UDA	Ultra-High Frequency Data Collection System Antenna
MHS	Microwave Humidity Sounder	VRA	Very High Frequency Real-time Antenna
NEA	Nitrogen Engine Assembly		

*Not shown in this view

Satellite Operations Control Center

The control center for satellite operations is located at NOAA's National Environmental Satellite, Data and Information Service at Suitland, Md. The Satellite Operations Control Center (SOCC) is responsible for operational control of the entire ground system and the following areas:

Command and Data Acquisition Stations

The primary CDA stations are located at Fairbanks, Alaska, and Wallops Island, Virginia. A remote limited-function CDA facility, built and maintained by the NOAA Fairbanks CDA station, is located in Point Barrow, Alaska, on the Arctic Circle. Due to its high latitude, Point Barrow provides monitoring and S-band command capability for the "blind orbits" not normally seen by the primary Wallops and Fairbanks CDA stations.

The command and data acquisition stations transmit commands to the satellites and acquire and record environmental and engineering data from the satellites for retransmission to the Satellite Operations Control Center. All data and commands are transmitted between the Satellite Operations Control Center and the Command and Data Acquisitions via commercial communications links.

Ground Communications

The ground communications links for satellite operations are provided by the Satellite Communications Network and the NASA Communications Network. The NASA Communications Network provides any launch-unique communications links for satellite launch. Satellite Communications Network provides all voice and data links between the Satellite Operations Control Center and the command and data acquisition stations after launch. Satellite Communications Network is provided and operated by National Environmental Satellite, Data, and Information Service.

National Environmental Satellite, Data, and Information Service Satellite Processing Center (ESPC)

Central Environmental Satellite Computer System acquires the data from the command and data acquisition stations via the Satellite Operations Control Center and is responsible for data processing and the generation of meteorological products on a timely basis to meet the POES program requirements. NOAA provides all hardware and software for Central Environmental Satellite Computer System. NOAA will provide ephemeris data.

Search And Rescue Ground System (Local User Terminals And Mission Control Centers)

The U.S. Local User Terminals (LUTs) are located at the Command and Data Acquisition Station at Fairbanks, Alaska; Vandenberg AFB, California; the U.S. Coast Guard (USCG) Communications Station at Wahiawa, Hawaii; the USCG Communications Station at Miami, Florida; NOAA at Suitland, Maryland; and Anderson AFB, Guam.

The LUTs receive SAR data from the NOAA polar-orbiting and geosynchronous satellites and also from other low-Earth-orbiting satellites. Determines the location of any activated distress beacons, and forwards the data to the U.S. Mission Control Center (USMCC) at Suitland, Maryland. The USMCC first validates the distress situation and then determines the proper Rescue Coordination Center (RCC). It then forwards the distress location data to the RCC after removing redundant information. Additionally, a test ground station is maintained at NASA Goddard Space Flight Center (GSFC) in Greenbelt, Maryland. This system is part of the worldwide Cospas-Sarsat Program that consists of 40 countries who participate in the management of the program: 31 of these provide MCCs and LUTs, and 9 additional countries receive the data. All MCCs cooperate in sending data to provide rapid global delivery of distress locations received through the satellites.

Goddard Space Flight Center Facility Support

The Office of Space Communications associated support is requested through the Mission Requirements Request

and the Detailed Mission Requirements Document, with other support as described in Memoranda of Understanding. NASA/Goddard Space Flight Center provides nominal prelaunch orbital and prediction information, special support for initial orbit estimation and initial quality control checks of the North American Air Defense Command orbital data. All ground attitude determination is to be accomplished by the NOAA central data processing facility.

The North American Air Defense Command

North American Air Defense Command has prime responsibility for orbit determination, which includes establishing the initial orbit solution and providing updated orbital parameters routinely throughout the life of the mission.

Launch, Early Orbit And Contingency Downlink

A 2247.5-MHz S-band downlink is used during satellite ascent to recover TIP boost telemetry through Western Range (WR) tracking sites. From launch through spacecraft separation, WR stations, mobile telemetry, McMurdo NASA Antarctic Interactive Launch Support (NAILS), and Malindi in Kenya will provide spacecraft tracking and telemetry. Following spacecraft separation and through spacecraft transition and handover to orbit, the GN station at Svalbard, Norway and the NOAA Fairbanks CDA facility will provide spacecraft tracking and support. The Space Network Tracking and Data Relay Satellite System (TDRSS) will provide best-effort tracking and telemetry support on a near-continuous basis from launch through spacecraft separation and handover and transition to orbit mode.

During on-orbit operations, orbit mode TIP/AIP and command capability will be available for early orbit and contingency support as follows. Command and telemetry support will be provided by the NOAA CDAs; the Universal Space Network (USN) operated sites at Dongara, Australia, Southpoint, Hawaii; Santiago, Chile (operated by the University of Chile), and Svalbard, Norway via the GN; and the McMurdo (NAILS) Facility in Antarctica. Telemetry support only will be provided from the NOAA Point Barrows, Alaska site. TDRSS will provide telemetry on a best-effort basis as requested by the Project.

Program Management/Responsibility

NASA and NOAA are actively engaged in a cooperative program to develop and launch the NOAA Polar Operational Environmental Satellites.

NOAA manages the overall POES Program and establishes requirements, provides funding, distributes environmental data for the United States, and determines the need for satellite replacement. NOAA also designs and develops the ground system needed to acquire, process and disseminate the satellite data. NASA is responsible for the construction, integration and verification testing of the spacecraft, instruments and unique ground equipment.

GSFC is responsible for in-orbit satellite checkout and evaluation. NOAA is responsible for program funding and the in-orbit operation of the system. NOAA also determines the need for satellite replacement. NASA's Kennedy Space Center is responsible for launch services from VAFB, Calif. NASA coordinates the launch of the spacecraft with the U.S. Air Force at VAFB, Calif.

NOAA-N Prime will be launched from the Western Range at VAFB, by a two-stage Boeing Delta II 7320-10 space launch vehicle. After launch, NASA checks out the satellite to assure it meets its performance requirements. NASA turns operational control of the spacecraft over to NOAA after 45 days of comprehensive subsystem checkout. NOAA-N Prime becomes NOAA-19 when it is turned over to NOAA. An on-orbit instrument performance verification period lasts an additional 24 days.

NASA's Kennedy Space Center will conduct launch operations at the VAFB. They are responsible for all launch preparations, the Launch-1 Mission Briefing, photo coverage, launch commentary and NASA TV coverage originating from Vandenberg Air Force Base.

NASA Program Management:
Headquarters
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Science Mission Directorate

Goddard Space Flight Center
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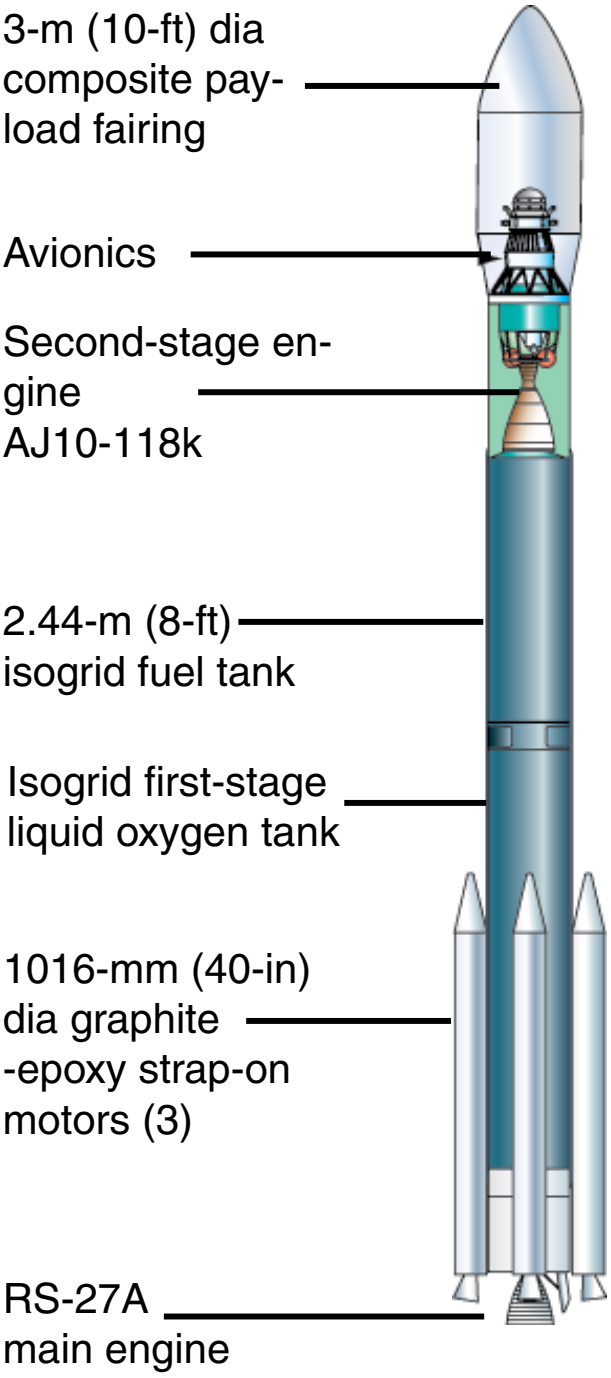
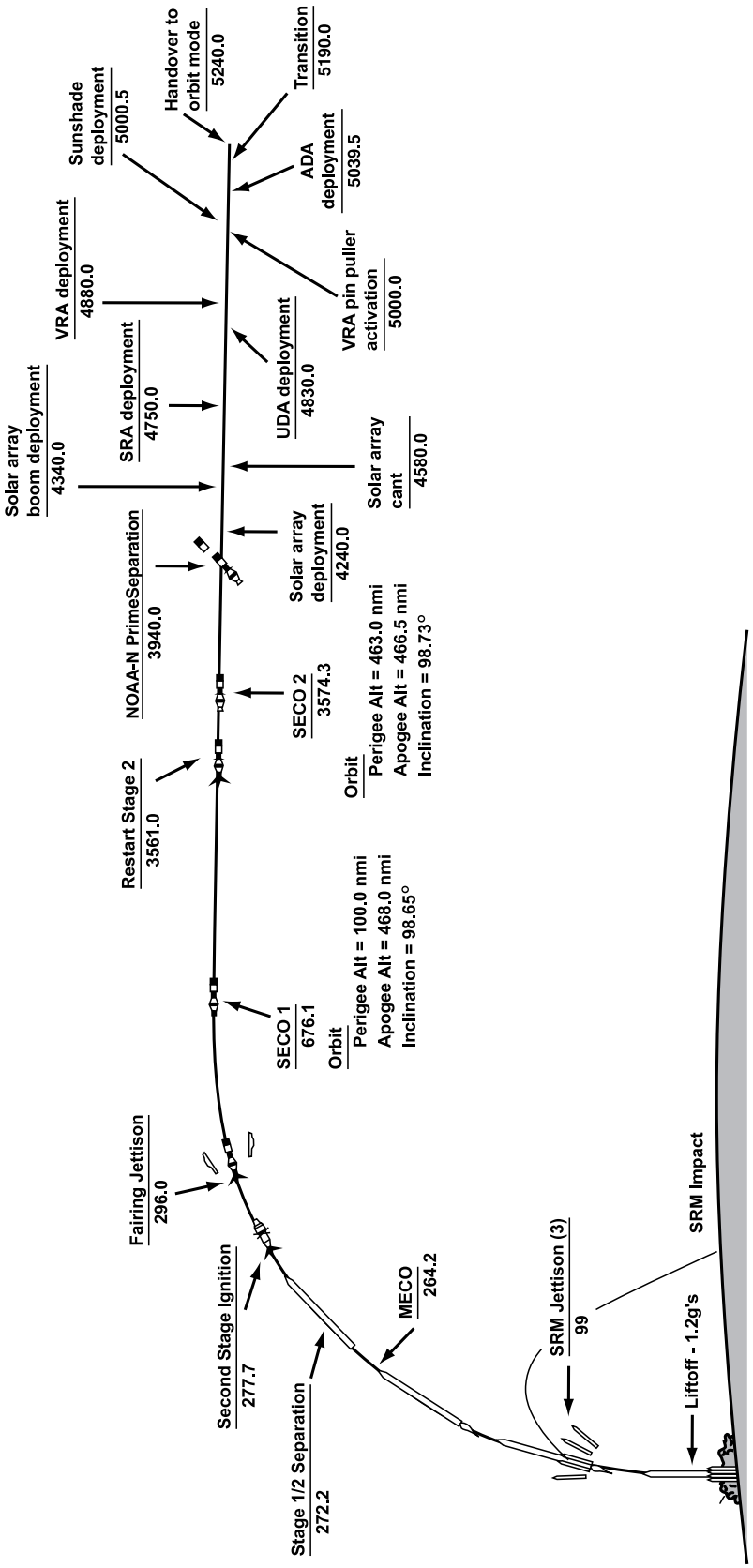
NOAA Management:
Michael Mignogno, NOAA POES Program Manager
Jim Parker, POES Acquisition Engineer
Tom Wrublewski, Acting, Polar Satellite Acquisition Manager



Delta II 7320-10
Space Launch Vehicle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MECO
264.2
Second Stage Ignition
277.7
Stage 1/2 Separation
272.2
Fairing Jettison
296.0
SECO 1
676.1
Orbit
Perigee Alt = 100.0 nmi
Apogee Alt = 468.0 nmi
Inclination = 98.65°
Restart Stage 2
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NOAA-N PrimeSeparation
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Solar array deployment
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SRA deployment
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UDA deployment
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VRA pin puller activation
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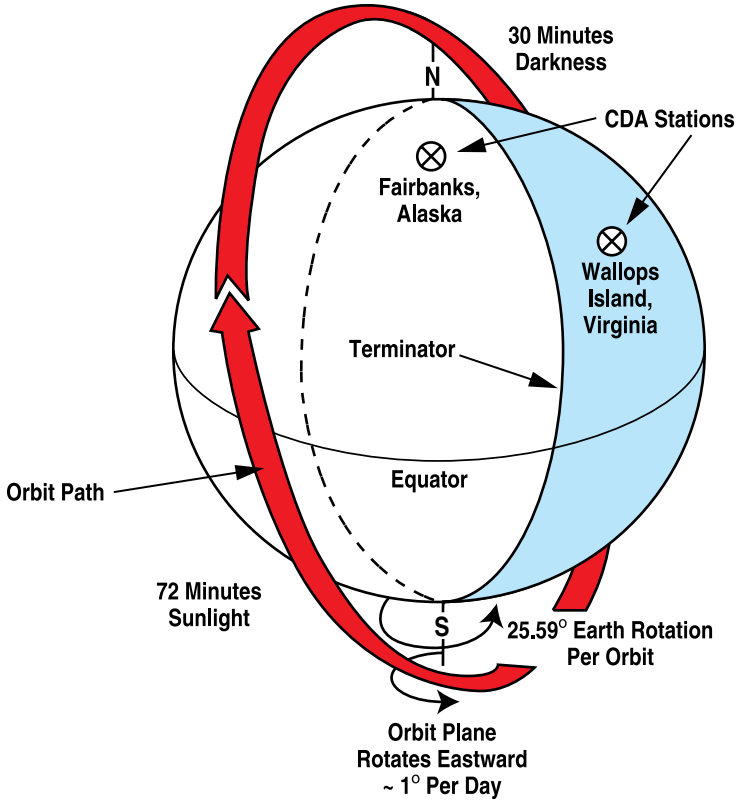
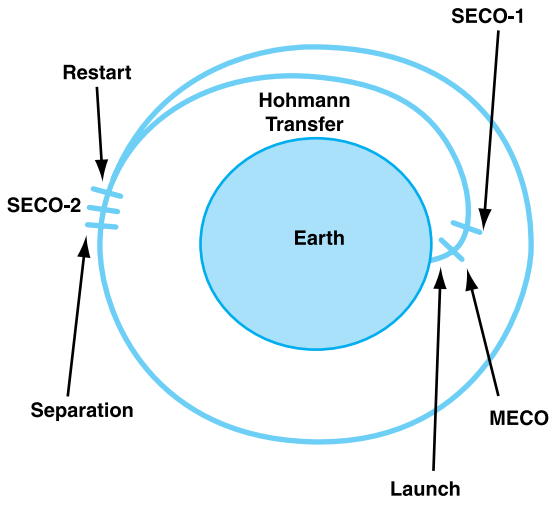
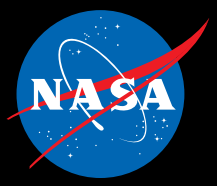
NOAA-N Prime Orbit







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