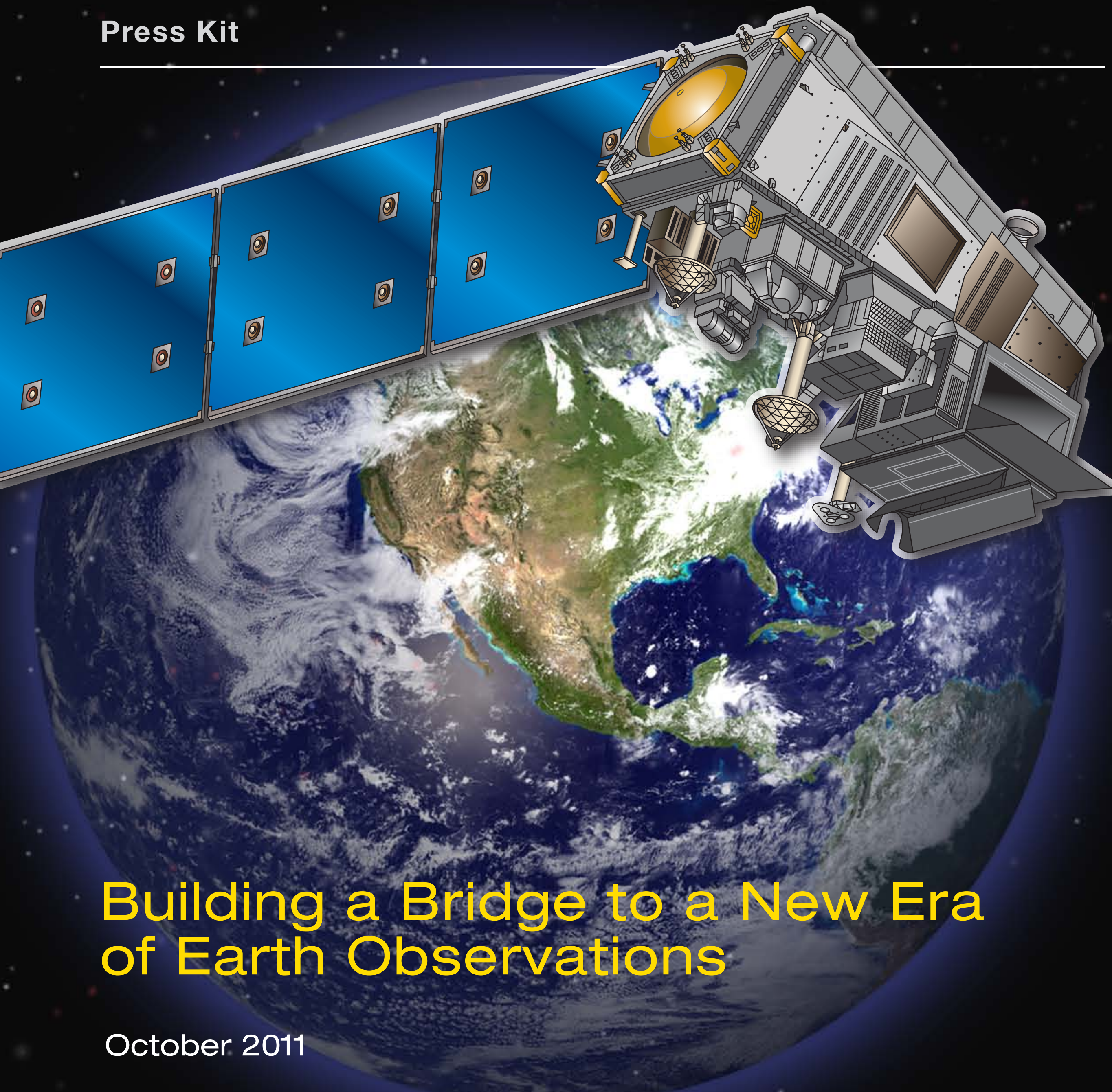
National Aeronautics and Space Administration

NPP

Press Kit



npoess preparatory project

Building a Bridge to a New Era of Earth Observations

October 2011

www.nasa.gov

NPP

NPOESS Preparatory Project

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Media Services Information

News Center/Status Reports

The NASA Newsroom in the NASA Resident Office at Vandenberg Air Force Base (VAFB) will be the center of public affairs and news media operations from L-5 days through launch until approximately five hours after a successful launch.

To speak with a NASA communications specialist, call 805-605-3051. A recorded launch status report also will be available starting at that time by dialing 805-734-2693 or 301-286-NEWS.

Prelaunch Press Briefing

The L-1 prelaunch press briefing is scheduled for October 25 at 1 p.m. PDT at the NASA News Center at VAFB. Information presented will include the details about the Delta II countdown, launch readiness of NPP, background on the satellite and its mission, and the launch weather forecast. The briefing will be carried live on NASA TV. Audio of the conference will be carried on the NASA “V” circuits, which may be accessed by dialing 321/867-1220...1240...1260...7135.

Postlaunch Press Briefing

A postlaunch press conference will be held approximately 2 hours and 30 minutes after the spacecraft is safely in orbit. The postlaunch briefing will be held in the NASA News Center at VAFB.

Media Credentialing

News media desiring accreditation for the prelaunch and launch activities of NPP should fax their requests on news organization letterhead to:

Jeremy Eggers
30th Space Wing Public Affairs Office
Vandenberg Air Force Base, CA

Telephone: 805-606-3595
FAX: 805-606-4571
E-mail: jeremy.eggers@vandenberg.af.mil

Information required for U.S. media is full legal name, date of birth, and media affiliation. Legal photo identification will be required upon arrival at Vandenberg.

NASA TELEVISION COVERAGE

NASA Television will carry the prelaunch news conference and mission science briefing starting at 1 p.m. PDT (4 p.m. EDT) on Tuesday, October 25. The prelaunch news conference also will be webcast at:

http://www.nasa.gov/ntv

On launch day, Thursday, October 27, NASA TV commentary coverage of the countdown will begin at 12:01 a.m. PDT (3:01 a.m. EDT). Liftoff is targeted for 2:48:01 a.m. PDT (5:48:01 a.m. EDT). Spacecraft separation from the Delta II occurs 58 minutes 45 seconds after launch.

For information on receiving NASA TV, go to:

http://www.nasa.gov/multimedia/nasatv/digital.html

VOICE CIRCUIT COVERAGE

To monitor audio of the prelaunch news conference and the launch coverage, dial the NASA “V” circuits, which may be accessed directly at 321-867-1220....-1240....-1260. This audio is monitor only. “Mission Audio” of countdown activities without NASA launch commentary will be carried on 321-867-7135 beginning at 12:01 a.m. PDT (3:01 a.m. EDT).

WEB COVERAGE

Launch coverage of the Delta II NPP countdown activities will be available on the NASA website by going to the home page at:

http://www.nasa.gov

Live countdown coverage on NASA’s launch blog begins at 12:01 a.m. PDT (3:01 a.m. EDT). Coverage features real-time updates of countdown milestones, as well as streaming video clips highlighting launch preparations and liftoff.

To access these features, go to NASA’s NPP mission website at:

http://www.nasa.gov/npp

October 12, 2011

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RELEASE: 11-345

NASA READIES NEW TYPE OF EARTH-OBSERVING SATELLITE FOR LAUNCH

WASHINGTON -- NASA is planning an Oct. 27 launch of the first Earth-observing satellite to measure both global climate changes and key weather variables.

The National Polar-orbiting Operational Environmental Satellite System Preparatory Project (NPP) is the first mission designed to collect critical data to improve weather forecasts in the short-term and increase our understanding of long-term climate change. NPP continues observations of Earth from space that NASA has pioneered for more than 40 years.

NPP's five science instruments, including four new state-of-the-art sensors, will provide scientists with data to extend more than 30 key long-term datasets. These records, which range from the ozone layer and land cover to atmospheric temperatures and ice cover, are critical for global change science.

"NPP's observations of a wide range of interconnected Earth properties and processes will give us the big picture of how our planet changes," said Jim Gleason, NPP project scientist at NASA's Goddard Space Flight Center in Greenbelt, Md. "That will help us improve our computer models that predict future environmental conditions. Better predictions will let us make better decisions, whether it is as simple as taking an umbrella to work today or as complex as responding to a changing climate."

NPP serves as a bridge between NASA's Earth Observing System of satellites and the planned Joint Polar Satellite System (JPSS), which will collect climate and weather data. JPSS will be developed by NASA for the National Oceanic and Atmospheric Administration (NOAA).

NOAA meteorologists will incorporate NPP data into their weather prediction models to produce forecasts and warnings that will help emergency responders anticipate, monitor and react to many types of natural disasters.

“The timing of the NPP launch could hardly be more appropriate,” said Louis W. Uccellini, director of NOAA’s National Centers for Environmental Prediction in Camp Springs, Md. “With the many billion dollar weather disasters in 2011, NPP data is critical for accurate weather forecasts into the future.”

A Delta II rocket will carry NPP into an orbit 512 miles above Earth’s surface. Roughly the size of a mini-van, the spacecraft will orbit Earth’s poles about 14 times a day. It will transmit data once each orbit to a ground station in Svalbard, Norway, and to direct broadcast receivers around the world.

NPP is set to launch from Space Launch Complex 2 at Vandenberg Air Force Base in California on Oct. 27. The launch window extends from 5:48 a.m. to 5:57 a.m. EDT. The launch recently was delayed two days due to the repair of the Delta II’s hydraulic system. The NPP spacecraft is scheduled to be transported to the launch pad for attachment to the Delta II on Oct. 12.

NPP’s Delta II launch vehicle also will carry several auxiliary payloads into orbit, which together comprise NASA’s third Educational Launch of Nanosatellite, or ELaNa, mission. This mission will put five small research payloads, or CubeSats, into orbit: two for the University of Michigan; and one each for Auburn University, Montana State University and Utah State University.

Goddard manages the NPP mission for the Earth Science Division of the Science Mission Directorate at NASA Headquarters in Washington. The JPSS program is providing the ground system for NPP. NOAA will provide operational support for the mission. Launch management is the responsibility of the NASA Launch Services Program at the Kennedy Space Center in Florida.

For more information about NPP, visit:

http://www.nasa.gov/npp

NPP Quick Facts

Science Instruments: The five-instrument suite includes: the Visible/Infrared Imager Radiometer Suite (VIIRS); the Cross-track Infrared Sounder (CrIS); the Clouds and Earth Radiant Energy System (CERES); the Advanced Technology Microwave Sounder (ATMS); and the Ozone Mapping and Profiler Suite (OMPS).

Additional Payload: NASA's third Educational Launch of Nanosatellite, or ELaNa, mission will put five small research payloads, or CubeSats, into orbit: one each for Auburn University, Montana State University, and Utah State University, and two for the University of Michigan.

Mission Lifetime: The NPP mission has a design life of 5 years.

Launch Site: Space Launch Complex 2, Western Range at Vandenberg Air Force Base, CA

Launch Date/Window: October 27, 2011 with a 10-minute launch window from 5:48 – 5:57 am ET (2:48 – 2:57 am PT). The time and the window will remain the same in the event of a launch slip.

Spacecraft Separation and Events:

L +58.45 sec – spacecraft separation
L +90 min – solar array deployment and power positive
L +110 min – vector insertion from ULA (proper orbit)

First Satellite Signal Acquisition: L +60 min via Space Network

Spacecraft Orbit: 824 km circular, sun-synchronous polar orbit with a 1:30 p.m. local-time ascending node crossing.

Spacecraft Provider: Ball Aerospace & Technologies Corp.

Launch Vehicle: United Launch Alliance Delta II-7920-10 launch vehicle. The NPP space segment is comprised of six elements: the spacecraft, the five-instrument/sensor payloads, and the associated ground support equipment and simulators.

Launch Operations: United Launch Alliance

Spacecraft Operations: NOAA Satellite Operations Facility, Suitland, MD

Mission Management: NASA's Goddard Space Flight Center manages the NPP mission on behalf of the Earth Science Division at NASA Headquarters, Washington, DC. JPSS program is providing the ground system as well as the VIIRS, CrIS and OMPS instruments for NPP. NOAA institutional organizations will provide operational support for the mission.

Over the last dozen years, NASA has launched a series of satellites—including those known collectively as the Earth Observing System (EOS)—that provide critical insights into the dynamics of the entire Earth system including clouds, oceans, vegetation, ice and the atmosphere.

Now NASA is helping to create a new generation of satellites to extend these global environmental observations. A critical next step in this transition is the NPOESS Preparatory Project (NPP). This Earth science satellite began in a partnership between NASA, the National Oceanic and Atmospheric Administration (NOAA) and the Air Force. That partnership, the National Polar-orbiting Operational Environmental Satellite System (NPOESS) was reorganized and part of the system became the Joint Polar Satellite System (JPSS), which NASA is developing for NOAA.

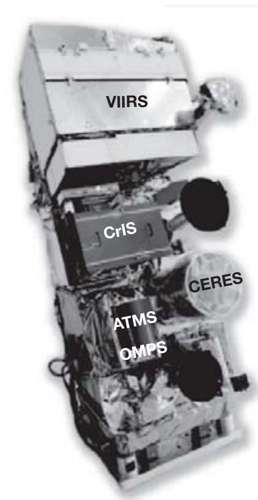
NPP is a satellite that carries five very different instruments to monitor the environment on Earth and the planet's climate. NPP measurements will be used to map land cover and monitor changes in vegetation productivity. NPP tracks atmospheric ozone and aerosols as well as takes sea and land surface temperatures. NPP monitors sea ice, land ice and glaciers around the world. In addition to continuing these data records, NPP is also able to monitor natural disasters such as volcanic eruptions, wildfires, droughts, floods, dust storms and hurricanes/typhoons.

In all, NPP monitors the health of Earth from space—providing continuity to decades-long records and setting the stage for future Earth science missions.

NPP's five instruments retrieve data about land surfaces, ocean and atmosphere and, as a result, NPP serves as an important link between the current generation of Earth-observing satellites and the next generation of climate and weather satellites.

NPP observes the Earth's surface twice every 24-hour day, once in daylight and once at night. In its orbit NPP flies 512 miles (824 kilometers) above the surface in a polar orbit, circling the planet about 14 times a day. NPP sends its data once an orbit to the ground station in Svalbard, Norway and continuously to local direct broadcast users.

Visible Infrared Imaging Radiometer Suite - VIIRS



The largest instrument aboard NPP is the Visible Infrared Imaging Radiometer Suite (VIIRS). It collects radiometric imagery in visible and infrared wavelengths of the land, atmosphere, ice and ocean. Data from VIIRS, collected from 22 channels across the electromagnetic spectrum, are used to observe active fires, vegetation, ocean color, sea surface temperature and other surface features. A variety of scientists study VIIRS data, much of which is used in monitoring the pace and impacts of climate change. Atmospheric scientists use some of these channels to observe clouds and small airborne particles called aerosols. Oceanographers use VIIRS to monitor phytoplankton and sediment in the seas. Terrestrial ecologists use it to monitor forest cover and productivity and ice experts use it to track changes in polar sea ice. VIIRS has similarities to the Moderate Resolution Imaging Spectroradiometers (MODIS) currently operating on two NASA satellites, Terra and Aqua.

Clouds and the Earth's Radiant Energy System - CERES
The Clouds and the Earth's Radiant Energy System (CERES) measures both solar energy reflected by the Earth and heat emitted by our planet. This solar and thermal energy are key parts of what's called the Earth's radiation budget. When sunlight hits Earth and its atmosphere, they warm up. Clouds and other light-colored surfaces like snow and ice reflect some of the sun's heat and light, cooling Earth, while additional cooling comes from heat that the Earth radiates to space. It's crucial for scientists to understand this complex Earth radiation budget system. The changing role of clouds in this system is one of the biggest unknowns in climate science. So scientists need long-term, stable data sets to make accurate projections of global climate change. NPP's CERES instrument continues a multi-year record of the amount of energy entering and exiting from the top of Earth's atmosphere. A total of four other CERES instruments fly on the EOS satellites Terra and Aqua.

Cross-track Infrared Sounder – CrIS
The Cross-track Infrared Sounder (CrIS) and the Advanced Technology Microwave Sounder (ATMS) work together, providing global high-resolution profiles of temperature and moisture. These advanced atmospheric sensors create cross-sections of storms and other weather conditions, helping with both short-term 'nowcasting' and long-term forecasting. CrIS measures continuous channels in the infrared region and has the ability to measure temperature profiles with improved accuracy over its predecessor instruments on operational satellites, and comparable accuracy to the Atmospheric Infrared Sounder (AIRS) on Aqua. NOAA will be using CrIS for numerical weather prediction and, because it is a brand new instrument, its use on NPP provides a real-world test of the equipment before NOAA's upcoming Joint Polar Satellite System (JPSS) missions.

Advanced Technology Microwave Sounder - ATMS
The Advanced Technology Microwave Sounder (ATMS) works in both clear and cloudy conditions, providing high-spatial-resolution microwave measurements of temperature and moisture. ATMS has better sampling and two more channels than previous instruments like the Advanced Microwave Sounding Units (AMSU), and it combines all of their abilities into one instrument. Working in concert, CrIS and ATMS together comprise the Cross-track Infrared Microwave Sounding Suite (CrIMSS).

Ozone Mapping and Profiler Suite - OMPS
The Ozone Mapping and Profiler Suite measures the ozone layer in our upper atmosphere—tracking the status of global ozone distributions, including the 'ozone hole.' It also monitors ozone levels in the troposphere, the lowest layer of our atmosphere. OMPS extends out 40-year long record ozone layer measurements while also providing improved vertical resolution compared to previous operational instruments. Closer to the ground, OMPS's measurements of harmful ozone improve air quality monitoring and when combined with cloud predictions; help to create the Ultraviolet Index, a guide to safe levels of sunlight exposure. OMPS has two sensors, both new designs, composed of three advanced hyperspectral-imaging spectrometers.

Q. What is NPP?

A. NASA's NPOESS Preparatory Project (NPP) satellite will serve as a bridge between NASA's current Earth Observing System (EOS) satellites and the forthcoming series of Joint Polar Satellite System (JPSS) satellites. NPP will collect long-term climate data while simultaneously taking measurements necessary for weather forecasting. (NPOESS stands for the National Polar-orbiting Operational Environmental Satellite System. NPOESS was recently re-organized and no longer exists. NPP is now preparatory to the Joint Polar Satellite System, a NOAA program in which NASA serves as a key partner. NPP represents a critical first step in preparing for this next-generation satellite system.)

NPP has three major goals:

- To provide NASA with continuation of a group of global change observations initiated by the Earth Observing System (EOS) Terra, Aqua, and Aura missions.
- To provide NOAA and the operational community with pre-operational risk reduction demonstration and validation for selected JPSS instruments, and algorithms, as well as ground processing.
- NOAA intends to use the NPP data for operational weather forecasting until JPSS is operational.

Q. What are the key science objectives of the NPP mission?

A. NPP will monitor the Earth from space, helping scientists understand how the planet is changing over time and providing insights into the dynamics of the entire Earth system: clouds, oceans, vegetation, ice, solid Earth, atmosphere, ozone layer, Earth's energy budget, and weather.

Q. What instruments are onboard NPP?

A. NPP contains a suite of five instruments that will acquire observations of key attributes of the Earth, including measurements of cloud and vegetation cover, ice cover, ocean color, and sea and land surface temperatures.

The five-instrument suite includes: the Visible/Infrared Imager Radiometer Suite (VIIRS); the Cross-track Infrared Sounder (CrIS); the Clouds and Earth Radiant Energy System (CERES); the Advanced Technology Microwave Sounder (ATMS); and the Ozone Mapping and Profiler Suite (OMPS).

Q. Are there any instruments flown for the first time on NPP or previous ones that have been substantially improved?

A. Four of the instruments—VIIRS, CrIS, OMPS and ATMS—are new state-of-the-art instruments. The data products will be similar to the data produced by the NASA Earth Observing System program. The NPP CERES instrument is the same as the EOS CERES instruments.

Q. Which instrument is most critical to the success of the mission?

A. Each of the instruments provides vital environmental information to enable researchers to continue decadal data records. All five instruments make essential measurements; all five are critically important for the climate science and weather applications of the mission.

Q. The NPP mission has a design life of 5 years. Do the instruments have the same design life?

A. The VIIRS, CrIS, ATMS and OMPS sensors as developed for the NPOESS mission had a design lifetime of 7 years. Due to the challenges seen during the development of the VIIRS, CrIS and OMPS instruments, there is some concern that their instrument lifetimes could be less, however we are hopeful that they will exceed expectations and provide polar environmental data for many years. The CERES instrument was built during the EOS Program along with 4 other flight models still operating on-orbit after about 10 years.

Q. Why will NPP circle the Earth in a polar orbit?

A. A polar orbit allows the satellite to observe the entire globe from the southern polar region to the northern polar region and at all longitudes. As the satellite moves from pole to pole, orbiting Earth roughly every hundred minutes, the Earth spins underneath the satellite's path, allowing the entire globe to be observed over time. NPP does not cross the north and south poles exactly. It is in what is called a near-polar sun-synchronous orbit. This is a special orbit that effectively allows the satellite to observe the polar regions by passing close to them, but it also is an orbit that allows the satellite to pass over any point on Earth at the exact same local time each day.

Q. How will data from NPP be made available to users?

A. NPP data will be transmitted to the ground once every orbit to the NPP ground station in Svalbard, Norway. The data will be sent back to the United States via fiber optic cable to the NOAA Satellite Operations Facility (NSOF) in Suitland, Md. NPP data will be processed into environmental data records by the Interface Data Processing Segment (IDPS). NOAA and NASA will make the data available through various archive capabilities.

Q. How will NASA use the data produced by NPP?

A. The NPP mission will help link the current generation of Earth-observing satellites called the Earth Observing System (EOS) to a next-generation of operational polar-orbiting environmental satellites called the Joint Polar Satellite System (JPSS), managed by the National Oceanic and Atmospheric Administration (NOAA).

In the near term, NASA will first evaluate the Environmental Data Records (EDRs) being produced by the JPSS processing system and demonstrate their suitability for use as Earth System Data Records (ESDRs) and/or Climate Data Records (CDRs). If needed, NASA's NPP Science Team will also develop and evaluate improvements and then recommend potential improvements to JPSS.

In the long term, the data collected by NPP will be used by NASA scientists to extend and improve upon the Earth system data records previously established by the Earth Observing System series of satellites. These satellites have provided critical insights into the dynamics of the entire Earth system comprised of clouds, oceans, vegetation, ice, solid Earth and atmosphere. This data will help scientists to extend a continuous record of long-term satellite data of a quality sufficient to detect and quantify global environmental changes.

Q. How will NOAA use the data produced by NPP?

A. NOAA will provide data from NPP to meteorologists for weather forecasting and to climate scientists to address an array of research questions. Climate scientists will use the data to enhance their understanding of climate change, meteorologists to make more accurate live-saving weather forecasts and warnings, and emergency responders to monitor and react to natural disasters.

NPP temperature and moisture profiles will be used as input to weather forecast models to help improve weather forecast capabilities. NOAA will evaluate the performance of the new instruments, VIIRS, CrIS, ATMS, and OMPS, and become familiar with their data products prior to their becoming the source of NOAA's operational data record with the first JPSS satellite.

PROGRAMMATIC

Q. How is NPP program managed?

A. NASA's Goddard Space Flight Center manages the NPP mission on behalf of the Earth Science Division at NASA Headquarters. Approximately 3 months after the launch of NPP, the program will be handed over to the Joint Polar Satellite System (JPSS) program for operations. The JPSS program will provide all post-delivery and on-orbit support for the NPP instruments in addition to providing the ground system. NOAA institutional organizations will provide operational support for the mission. Approximately 9-15 months after launch, the JPSS program will hand over operations for NPP to the NOAA operations group.

Q. How is NPP related to the Joint Polar Satellite System (JPSS)?

A. The NPP was meant to provide risk reduction for the National Polar-orbiting Operational Environmental Satellite System (NPOESS) managed by the NPOESS Integrated Program Office (IPO). NPP was to provide an opportunity to demonstrate and validate new instruments, algorithms, and pre-operational command, control, communication and processing capabilities prior to the first NPOESS flight.

In 2010, due to cost overruns and delays, a task force led by the President's Office of Science and Technology Policy (OSTP) recommended restructuring to form JPSS.

The OSTP recommended that NOAA should be responsible for the satellites in the afternoon orbit and the observations planned for the first and third NPOESS satellites, and this program became the Joint Polar Satellite System (JPSS). NASA is developing JPSS for the National Oceanic and Atmospheric Administration (NOAA). OSTP also recommended that DoD should be responsible for the satellites in the morning orbit and the observations planned for the second and fourth NPOESS satellites and that program became the Defense Weather Satellite System (DWSS). Due to delays in the former

NPOESS program, NOAA intends to use the data from NPP operationally to maintain accurate weather forecasting capabilities until JPSS is launched and operational.

Q. Since the instrument procurements were begun under the NPOESS Integrated Program Office (IPO), is there any risk that they may not have undergone the same strict level of testing required under a NASA contract for quality assurance?

A. The instruments have been thoroughly tested, characterized and calibrated. The testing was analyzed by both the contractor and independent government teams. All the NPP instruments have had a residual risk analysis that addresses differences between the IPO and NASA mission assurance processes.

Q. NPP will be launching 5 years after originally planned under the NPOESS Integrated Program Office (IPO) mission. Considering how fast technology changes, are the instruments still considered cutting edge? Will the data obtained still be relevant?

A. The instruments are new, but more importantly these data products are important to continue both the improved forecasts and the continuous Earth system data records. The NPP instruments are considered state-of-the-art sensors even with the delays in their development.

Q. What launch vehicle will be used for NPP?

A. The NPP satellite will be launched onboard a United Launch Alliance Delta II-7920-10 launch vehicle. NPP will be launched from the Western Range at Vandenberg Air Force Base from SLC-2, Calif., into an 824 km circular, sun-synchronous polar orbit with a 1:30 p.m. local-time ascending node crossing.

Q. Who will operate NPP after launch?

A. NASA will operate NPP for the first 3 months after launch to complete satellite and instrument checkout. After the first 3 months, the JPSS program will operate NPP from the NOAA Satellite Operations Facility (NSOF) in Suitland, Md. JPSS will hand over the operations for NPP to NOAA approximately 15 months after launch.

Q. What is the total cost for NPP? What portions were funded by NASA, NOAA and DoD?

A. The estimated total investment in the NPP mission is just over $1.5 billion. Of that total, NASA's projected final investment, for the NPP spacecraft, NASA instruments, and launch is $895 million. NOAA and the U.S. Air Force contributed an estimated $677 million under the NPOESS program for the VIIRS, CrIS, and OMPS instruments. (The estimated cost of these NPOESS-provided instruments is based on the estimated cost of building the next copies of these instruments for JPSS).

Q. Have there been any launch delays associated with NPP under NASA's management? Are there costs associated with the launch delays?

A. Since the breakup of NPOESS, the NASA funded NPP Project has met all of its technical and schedule goals with the exception of a two-day launch slip in October 2011.

The NPP space segment is comprised of six elements; the spacecraft, the five instrument/ sensor payloads, and the associated ground support equipment and simulators.

The NPP spacecraft is a member of the Ball Configurable Platform (BCP) family of spacecraft designed for cost-effective, remote sensing applications. Its proven design accommodates a wide range of payloads, including optical applications with sub-meter resolutions and synthetic aperture radar. The NPP spacecraft bus is the eighth of 11 spacecraft built by Ball Aerospace on the same BCP 2000 core architecture. In all, this architecture has more than 50 years of successful on-orbit operations. The BCP 2000 was designed to accommodate a wide variety of Earth-observing payloads that require precision pointing control, flexible high-data throughput and downlinks, and controlled re-entry. The NPP spacecraft incorporates both MIL-STD-1553 and IEEE 1394 (FireWire) data networks to support the payload suite. The spacecraft has a 5-year design life.

Ball Aerospace designed and built the spacecraft bus, under contract to Goddard Space Flight Center, and is responsible for integrating the instruments and for performing satellite-level testing and launch support. The bus was completed in 2005, and has since undergone extensive risk reduction testing. All five instruments have been integrated to the spacecraft.

The five instruments on the NPP satellite are:
- The Visible/Infrared Imager Radiometer Suite (VIIRS)
- The Cross-track Infrared Sounder (CrIS)
- The Advanced Technology Microwave Sounder (ATMS)
- The Ozone Mapping and Profiler Suite (OMPS)
- The Clouds and the Earth Radiant Energy System (CERES)

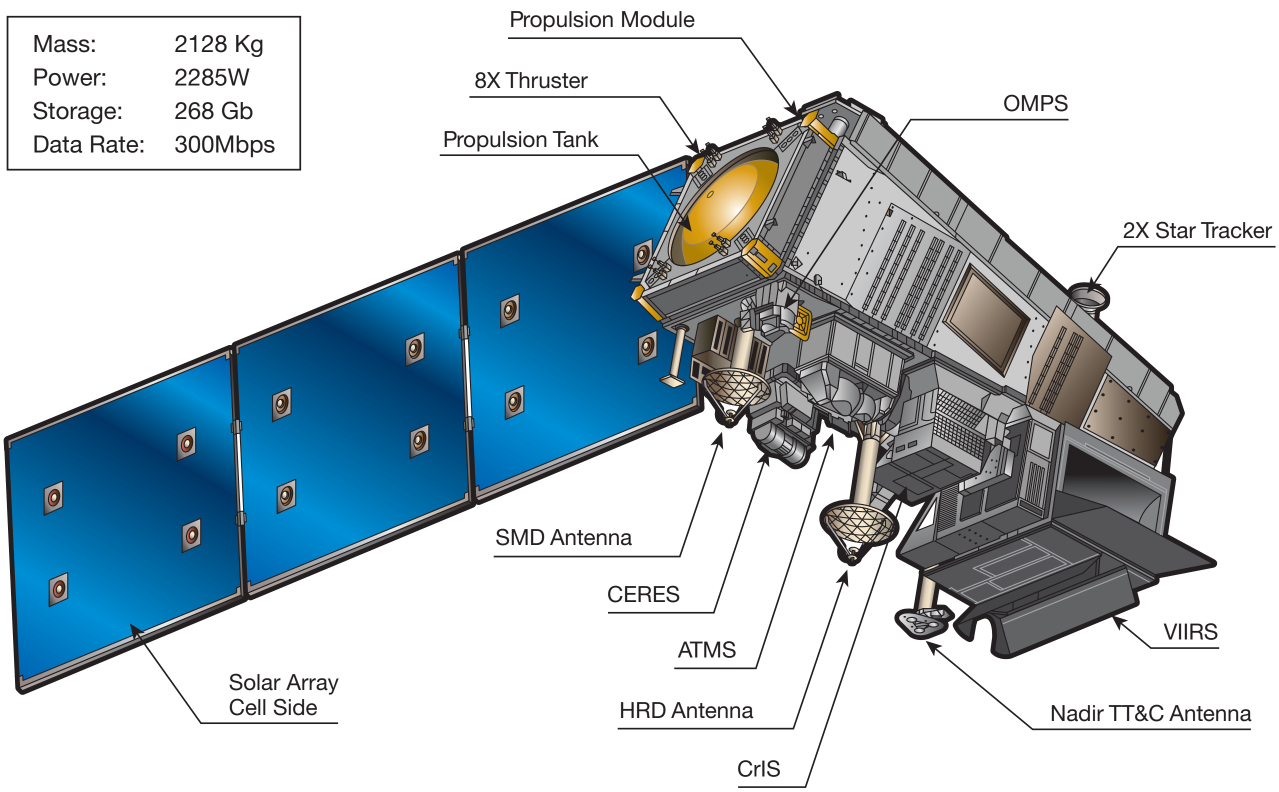
OMPS, built by Ball Aerospace, incorporates an advanced nadir-viewing sensor and a highly innovative limb-viewing sensor. OMPS instrument continues Ball’s history of building ozone measuring instruments and will continue the long-term continuous data record of ozone measurements from space.

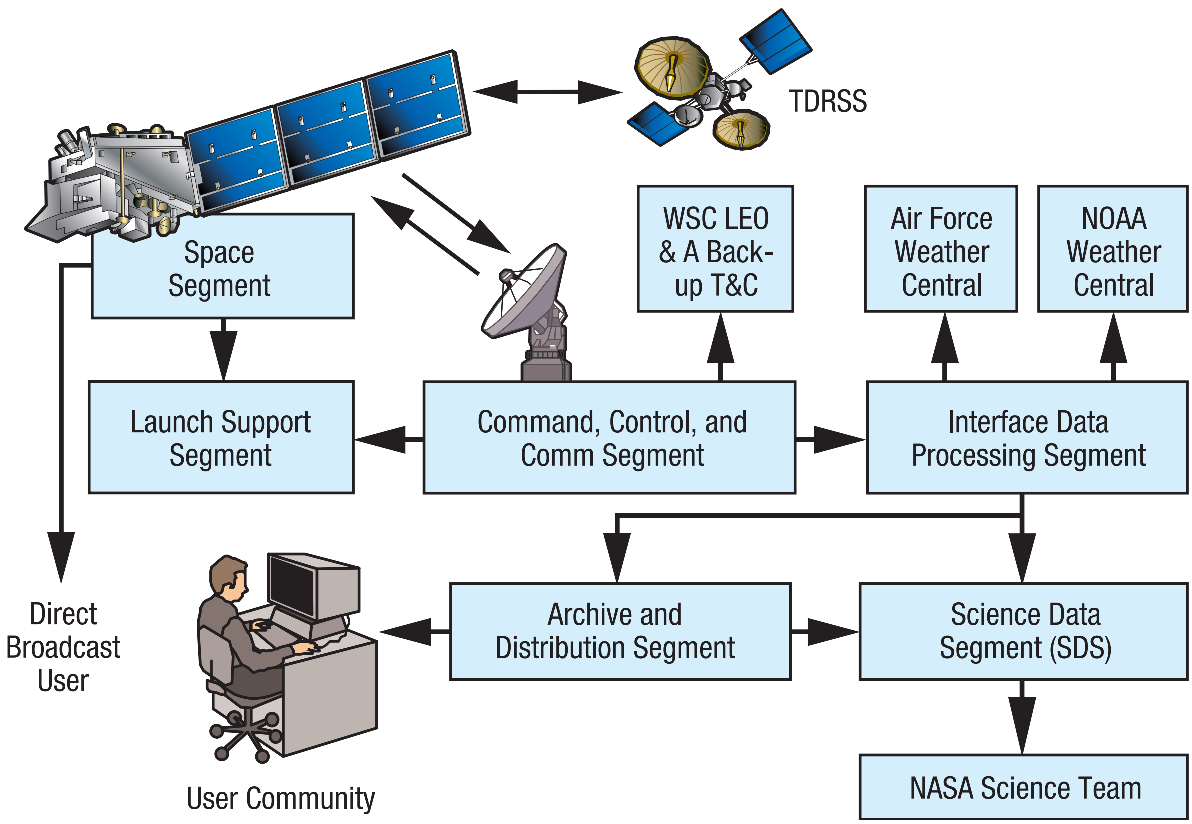
The five instruments manifested for flight on the NPP spacecraft trace their heritage to instruments on NASA’s Terra, Aqua and Aura missions, on NOAA’s Polar Operational Environmental Satellite (POES) spacecraft, and on DoD’s Defense Meteorological Satellite Program (DMSP).

The spacecraft for NPP will directly transmit stored mission sensor data to a receiving station in Svalbard, Norway, and will also provide continuous direct broadcast of real-time sensor data. The mission data will be routed on communications networks from Svalbard to the continental United States.

NPP On-Orbit Configuration

Mass:	2128 Kg
Power:	2285W
Storage:	268 Gb
Data Rate:	300Mbps




TDRSS
Space Segment
WSC LEO & A Back-up T&C
Air Force Weather Central
NOAA Weather Central
Launch Support Segment
Command, Control, and Comm Segment
Interface Data Processing Segment
Direct Broadcast User
Archive and Distribution Segment
Science Data Segment (SDS)
User Community
NASA Science Team

United Launch Alliance Delta II Launch Vehicle

The Delta II 7920-10C consists of the Delta II booster stage, the Delta II hypergolic second stage, nine solid rocket motors (SRMs), and a 10-foot diameter payload fairing (PLF).

The Delta II booster is 8 ft. in diameter and approximately 87 ft. in length. The booster's fuel and oxidizer tanks are structurally rigid and constructed of stiffened isogrid aluminum barrels and spun-formed aluminum domes. The booster structure is completed by the centerbody; which joins the fuel and oxidizer tanks and the LO2 Skirt; which joins the tank structure to the engine section. Delta booster propulsion is provided by the RS-27A engine. The RS-27A burns RP-1 (Rocket Propellant-1 or highly purified kerosene) and liquid oxygen, and delivers 200,000 lb of thrust at sea level. The Delta II booster is controlled by the second-stage avionics system, which provides guidance, flight control, and vehicle-sequencing functions during the booster and second-stage phases of flight.

The SRMs, approximately 40 in. in diameter and 42 ft. 6.7 in. in length, are constructed of a graphite epoxy composite with the throttle profile designed into the propellant grain. The six ground-lit SRMs are jettisoned by structural thrusters following an 86 and 87 second burn. The remaining 3 air-lit SRMs are ignited at 65.5 seconds and jettisoned by structural thrusters at 131.5 seconds after T-0.

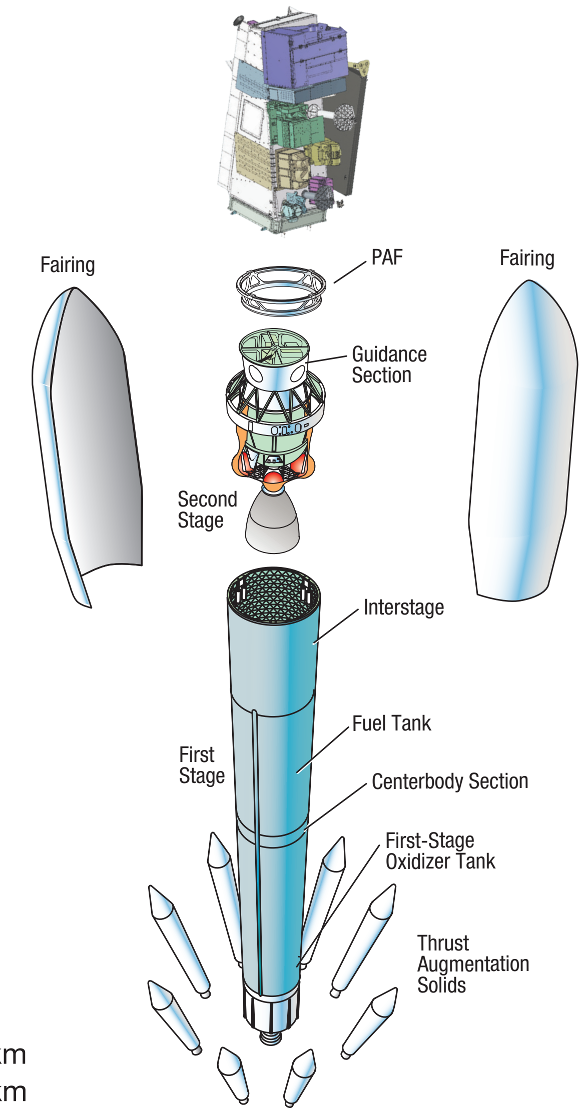
The second stage is 8 ft. in diameter and approximately 20 ft. in length. Its propellant tanks are constructed of corrosion resistant stainless steel. The Delta II second stage is a hypergolic-fueled vehicle (Aerozine 50 and Nitrogen Tetroxide). It uses a single AJ10-118K engine producing 9850 lb of thrust. The propellant tanks are insulated with Dacron/Mylar blankets. The second stage's miniskirt/guidance section provides payload's load path to the booster, the structural support for the second-stage propellant tanks and the PLF, mountings for vehicle electronics, and the structural and electronic interfaces with the spacecraft. The second-stage, other than the miniskirt, is nested inside the interstage adapter.

The NPP Satellite is encapsulated in the 10-ft. diameter PLF. The 10-ft. PLF is a sandwich composite structure made with a structural foam core and graphite-epoxy face sheets. The bisector (two-piece shell) PLF encapsulates the second stage's miniskirt/guidance section and the spacecraft; and separates using a debris-free pyrotechnic actuating system. The vehicle's height with the 10-ft. PLF is approximately 128 ft.

NPP will launch on-board the last manifested United Launch Alliance Delta II rocket and will maintain a polar orbit 512 miles (824 km) above our planet at an inclination of 98.7 degrees.

NPP Launch Vehicle Configuration

- Delta II Launch Vehicle (LV) Configuration: 7920-10
- Launch Site: SLC-2W at VAFB
- ILC October 27, 2011
  - Launch Window: 9 min 10 sec
- Mission Specific Requirements:
  - Three (3) SC Access Doors
  - 6915 Payload Attach Fitting
    - Four (4) Secondary Latches
    - Four (4) Separation Switch Pads
  - Two (2) 61 pin PLF Umbilical Connectors
  - GN2 SC Purge
- Mission Unique Requirements:
  - PLF Cleaned to MIL-STD 1246C 500 A
  - PAF Cleaned to MIL-STD 1246C 500 A
  - Class 10K PL Environment
  - 10' Composite PLF
  - Acquisition Assistance Message (AAM)
- LV Non-NPP Mission Requirements:
  - Accommodations for Three (3) P-PODs mounted to the DII Second Stage

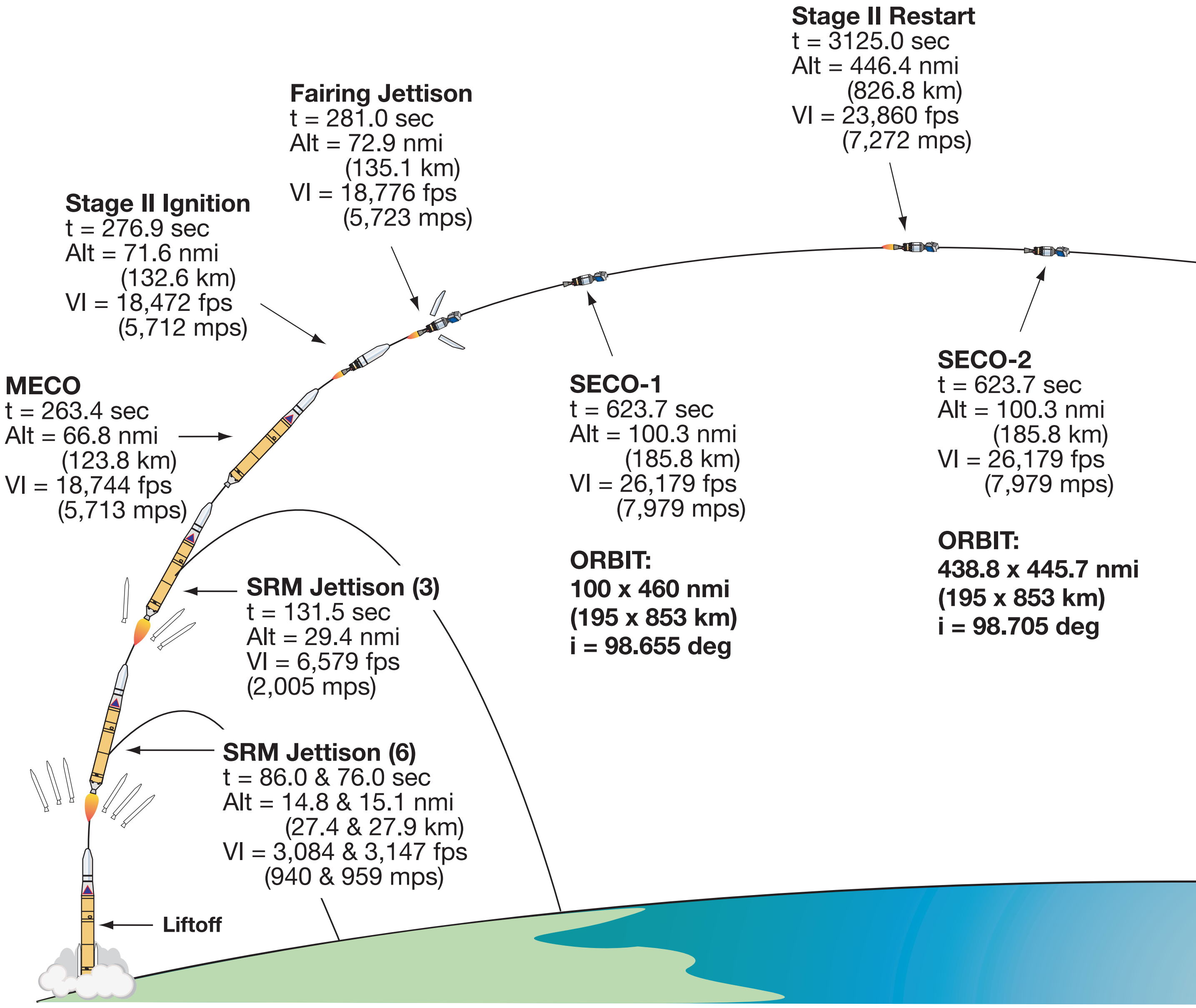


Mission Parameters

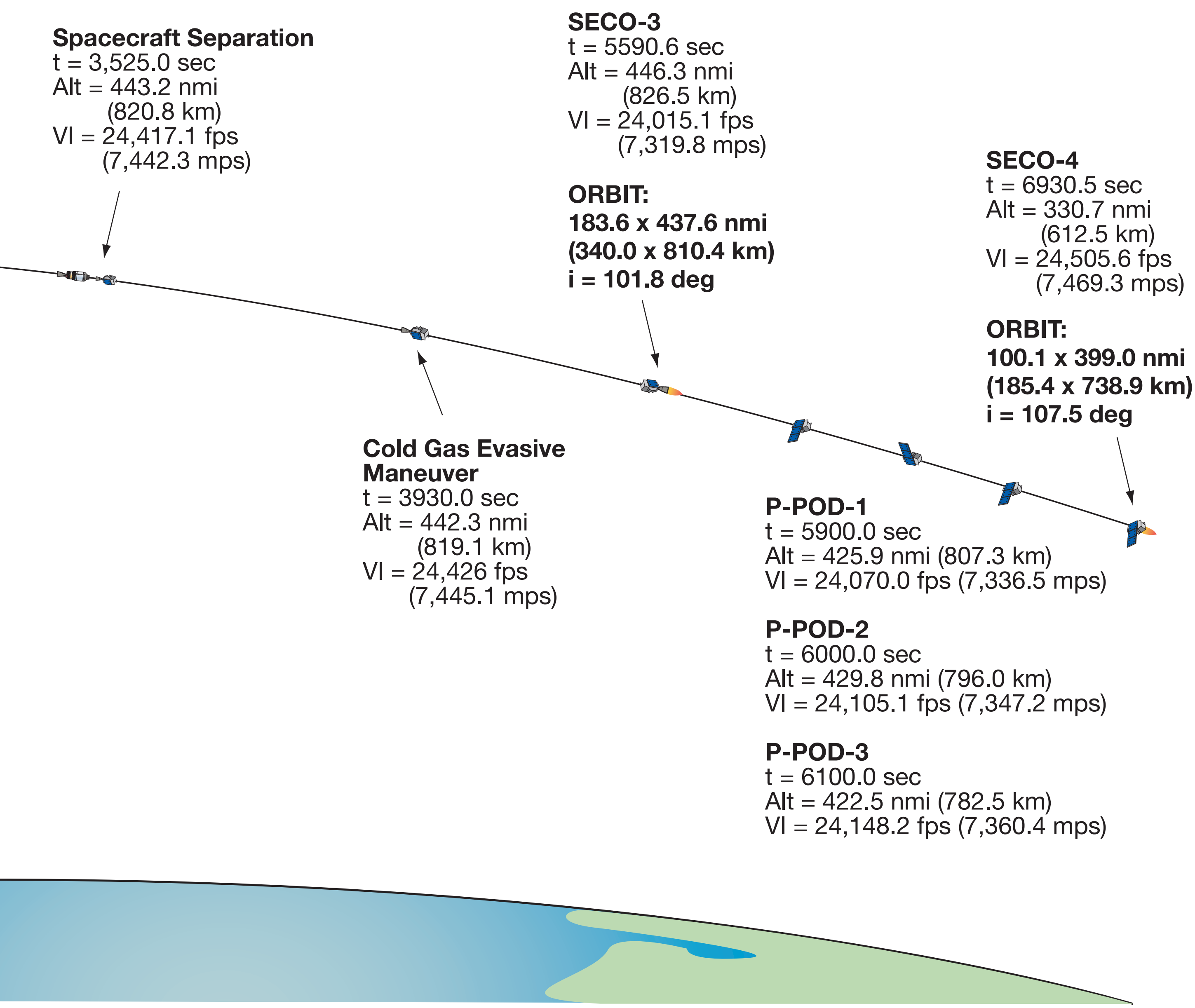
NPP Orbit Requirements

– Semi-Major Axis:	7201.16 km +/- 5km
– Apogee radius:	7210.16 km +/- 5km
– Inclination:	98.703 deg +/- 0.05
– Eccentricity:	0.00125 -0.00125 / + 0.00075
Payload Mass to Orbit	2270 kg (4994 lbs) (ICD)
Launch Date	27 October 2011
Time of Launch	9:48:01 UTC (2:48:01 am PDT @ VAFB)
Launch Window	Daily window 9 min 10 sec

NPP Flight Profile



NPP Flight Profile



For more information,
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