WRITTEN STATEMENT

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Introduction

Chairman Boehlert, Ranking Member Gordon and distinguished members of the Committee. I am Alexis Livanos, president of Northrop Grumman Space Technology and vice president of Northrop Grumman Corporation. I appreciate the opportunity to discuss the status of the National Polar-orbiting Operational Environmental Satellite System (NPOESS) with you today.

As the nation's next-generation environmental data system, NPOESS will provide global, 24/7 environmental monitoring, surpassing any existing capabilities. The NPOESS system of low-earth orbiting satellites, ground data processing networks, and a terrestrial communication network will play a pivotal role in weather preparedness in civil, military and science missions for the next 20 years, providing enormous advances in high-fidelity spectral, spatial, and temporal measurements over existing systems. NPOESS will give civilians more precise advance warning of hurricanes and severe weather, reducing the potential loss of human life and property; and will revolutionize battlefield situational awareness with timely knowledge of the weather for use by the military to its advantage during conflicts and operations. Observation to delivery time will be just 15 minutes compared to the hours that are needed today. Finally, the capability to

make measurements at precisely the same time each day maintains consistency in the long-term data records required for climate change analysis and assessment.

NPOESS Prime Contractor Responsibilities

Northrop Grumman is developing NPOESS under a contract awarded in August, 2002 by the NPOESS Integrated Program Office (IPO), which is jointly funded by the Department of Commerce and Department of Defense with participation from NASA. We are the prime contractor, responsible for overall system design, integration and performance. We are joined in this endeavor by a diverse team of subcontractors. Northrop Grumman Space Technology has the lead for system engineering and integration and the satellites. Our principal teammate and subcontractor, Raytheon, provides the ground segment products for command, control, communications and mission data processing and they also provide one of the most significant sensors on the spacecraft. Most sensors and a wide range of system components are provided by subcontractors from across the country. As a matter of fact, over 70 percent of the program is subcontracted effort.

NPOESS is being developed under a shared system performance responsibility (SSPR) contract, in which the government and contractor share both program risk and decisions. Our profit is at risk if the system doesn't perform. This is a powerful motivation to build a quality product that meets the nation's needs.

NPOESS is among Northrop Grumman Space Technology's highest priority programs. As the prime contractor, we take responsibility for the current status of the program and we are committed to successfully resolving the technical, cost, and schedule challenges it faces. Our goal is mission success.

The NPOESS satellites will host 13 sensor types; seven have new or modified designs and the rest have designs similar to existing instruments or have already been built. The seven new or modified instruments are the Visible/Infrared Imager Radiometer Suite (VIIRS), the Ozone Mapper/Profiler Suite (OMPS), the Cross-track Infrared Sounder

(CrIS), the Conical Scanning Microwave Imager/Sounder (CMIS), the Advanced Technology Microwave Sounder (ATMS), the Space Environmental Sensor Suite (SESS), and the Aerosol Polarimeter Sensor (APS). Recognizing that new sensors require a longer time for development, the IPO awarded development contracts for VIIRS, CrIS, OMPS and CMIS up to three years in advance of selecting Northrop Grumman as the prime contractor. The development of ATMS was done for NASA on a separate contract. The IPO sensor development work was subsequently transferred to Northrop Grumman. The SESS contract was awarded after Northrop Grumman became prime contractor, and the APS contract has not yet been awarded.

Northrop Grumman is also supplying the command, control, communications and data processing and on-orbit operations and support to the NPOESS Preparatory Project (NPP). NPP is a NASA mission with two purposes: (1) to provide data continuity between NASA's Earth Observing System science satellites and the NPOESS operational mission, and (2) to help in risk reduction for the deployment of the operational mission by flying selected instruments, installing the first-phase ground systems, and providing fully-processed data to users.

Historical Background

After completing the initial program baseline, Northrop Grumman learned of the Administration's FY04 and through FY07 budget cuts and FY03 Congressional budget reductions. These budget reductions directly impacted the NPOESS baseline and necessitated a complete replan of the program, which was completed in February 2004. We were directed to give NPP activities (sensor deliveries, ground system delivery, system integration, and mission operations preparations) a higher priority than down-stream NPOESS activities. As a result, contract funds originally intended for NPOESS were diverted to cover NPP-associated cost overruns and complete the NPP work.

NPOESS Program Status

The overall NPOESS system is making progress on many fronts. The ground data processing segment, the terrestrial communication network, and the spacecraft design are moving smoothly through development with no major issues. In June 2005, the System delta Preliminary Design Review (dPDR) was the capstone event for a top-to-bottom review of the NPOESS design. The review confirmed the soundness of the overall technical design and confirmed that the system would achieve the required technical performance. To support this review, we planned and executed a comprehensive set of six Preliminary Design Audits (PDAs) over the six months leading up to the formal, week-long System dPDR. The scope of this review was vast, spanning spacecraft, sensors, the ground segments, operations and support, system engineering, and end data product performance. During the review, more than 50 individual reviewers supporting seven review teams examined more than 570 design documents. The team successfully passed all PDAs and the dPDR, with no technical show-stoppers identified. The findings of the independent dPDR executive review team, comprised of highly experienced NASA, Aerospace, NGST/Raytheon, and User personnel, were complementary and beneficial for the next phase of development.

Both ground segment developments, including the Command, Control, and Communications Segment (C3S) and the Interface Data Processing Segment (IDPS), are proceeding according to plan. In October of this year, the team successfully completed the NPP portion of the C3S Factory Acceptance Test following six months of rigorous testing. Installation and integration of the C3S into all eight ground sites is scheduled to be complete by next May, with a Segment Acceptance Test next September.

Two of the four NPP sensors for the NPP risk reduction satellite are very mature in their development. The CrIS engineering development unit has been delivered to the spacecraft contractor for NPP, Ball Aerospace, for preliminary testing and the first CrIS flight unit will be delivered next spring. The ATMS engineering development unit and the flight unit, which were developed by Northrop Grumman Electronic Systems for NASA, have also been delivered. Delivery of these units has enabled Ball Aerospace to start performing initial interface testing of the sensors on the NPP spacecraft.

Current Program Estimates (Question 1)

When invited to appear before this Committee, I was asked to respond to four specific questions. The first question asked for our current estimate of program cost and launch date, and the steps that need to be taken to firm up the cost and schedule estimate.

Earlier this year, as it became apparent the cost overruns associated with sensor development activity would exceed available reserves, we developed options for how to proceed with the overall program. We submitted more than 30 options to our customer and more recently, the Independent Program Assessment team, and anticipate receiving direction in early 2006 on the path forward. At that time, we will immediately begin developing a new program baseline which will require establishing a new detailed schedule and cost estimate for the program and renegotiated subcontracts with our suppliers. The entire process may be completed in the fourth quarter of 2006. In the meantime, the IPO has directed us to create detailed plans for FY06 that are consistent with the current FY06 budget and will allow the program to proceed on a solid footing while the long-range options are evaluated through December of this year. We are often asked about why this takes so long – the reason is the detailed planning required to ensure that over 60,000 networked tasks remain properly phased to meet program needs.

The restructured program cost and launch readiness dates will depend on the direction we receive following the government's assessment of options and the decision on the path forward. Relative to the question about cost and launch dates, I can summarize that launch delays for the first two satellites range from months to years, and the cost increases can be $1 billion or more, depending on the assumptions and ground rules of the options examined. I'd like to add that the number cited in the invitation letter as the September 2003 baseline of $7.4 billion is a figure Northrop Grumman does not recognize as directly associated with our

contract. We regret the cost growth this program has experienced and recognize the impact it has on our customers, and consequently, have taken very substantial measures to fix the issues.

Sensor Development Challenges (Question 2)

The second question asked what Northrop Grumman Space Technology is doing to address the problems on the program and particularly what changes are we implementing in our oversight of the subcontractors.

More than 80 percent of the NPOESS cost growth and delay is attributable to the new instrument development activity. Northrop Grumman takes this responsibility very seriously and has responded with aggressive action to recover from the known problems. We have taken steps to correct systemic process issues that have been the root cause. As the prime contractor, it is our responsibility to oversee and manage the successful performance of all NPOESS subcontractors.

Five of the new sensors had passed early design reviews and were at different stages of development when Northrop Grumman was awarded the prime contract. After four of these sensor developments were transferred to NGST (ATMS remains under contract to NASA), we became aware that the instruments had some level of developmental challenge – but three instruments, VIIRS, OMPS, and CMIS – were experiencing unique problems that required sustained, tailored responses.

During an investigation into these problems, Northrop Grumman found that in some cases, the issues were isolated problems and responded to focused fixes. In other cases, however, the sensor problems resulted from systemic subcontractor process issues that required, and continue to require, broad-reaching Northrop Grumman and government intervention for proper resolution.

Northrop Grumman Space Technology has applied our own expertise and drawn on the resources of our corporation to assist the subcontractors. We are working closely with all the instrument subcontractors, but especially the VIIRS, OMPS, and CMIS subcontractors, by sharing our mission assurance, quality, hardware handling, software, testing, and design best practices, along with our program management best practices, to help them transition away from inadequate processes to a repeatable production process focus. In the long run, we believe these actions will improve our subcontractors' program performance and permit them to deliver production versions of the instruments, on-cost and on-schedule.

We are working diligently to put NPOESS on solid footing and have made organizational changes to further improve the performance of our instrument subcontractors. These changes include:

- Expanded and strengthened the expertise of our on-site and support subcontract management teams which are responsible for directing subcontractor program execution.
- Replaced the NGST NPOESS vice president and program director and the lead for the NPOESS sensors with very seasoned subcontract and program management expertise.
- Reassigned the NGST vice president for subcontracts to the NPOESS program as the NPOESS vice president and deputy program director to focus executive management attention on all NPOESS program suppliers.
- Made the vice president for subcontracts a direct report to the sector president to raise the level of oversight and review of all subcontractors across NGST.
- Instituted the practice of conducting technical and process "deep dives" into the subcontractor design and development activities at the first sign of problems utilizing Northrop Grumman expertise and resources. This intervention includes activities at the subcontractor's suppliers who are providing key components. We have co-located NGST engineers and program management at subcontractor facilities to help them solve problems.

- Increased the frequency of NGST-to-subcontractor executive communication meetings to assure issues are addressed rapidly.

A key lesson learned is to conduct early, extensive reviews of new subcontractors very soon after subcontract award, especially in cases where contractual responsibility is transferred. This is to ensure that supplier processes are robust and consistent with the comprehensive set of criteria we believe are needed for these developments and to ensure that development maturity is completely understood.

System Options (Question 3)

Your third question asked if Northrop Grumman made recommendations to the government on a path forward and what those options are. We spent many months studying alternatives at the request of our customer and have submitted more than 30 options to the IPO and more recently, the Independent Program Assessment team. These options are currently under consideration by the government.

Our criteria for these options were to fit within government specified funding limits, minimize life cycle costs, and meet defined mission objectives. The options involved trading increases in program schedule for reductions in near-term funding requirements. They also address reductions in scope, such as canceling a satellite or eliminating instruments. Options with longer schedules naturally increase the program's life cycle cost. The outcome of this planning activity, and subsequent additional cost growth, is heavily dependent upon the amount and timing of additional funds in FY 06-08. Our list of options is extensive, and in the interest of a successful NPOESS program, we believe we have carefully considered every major option.

Moving Forward (Question 4)

As part of looking ahead and studying alternatives, we have concluded that additional funds in FY06 and FY07 would significantly lower the program risk. The additional funds would allow us to shorten the development schedule, significantly reduce life cycle costs, resolve risk issues sooner, and decrease chances of a gap in environmental data and weather coverage. Additional funds would enable us to optimize the development schedule of two key sensors, VIIRS and CMIS. VIIRS is on the critical path to the NPP launch and CMIS is on the critical path to the first NPOESS launch. Additional funding would also help facilitate transition to a less risky development for the system overall. Any estimate of how much cost and time might be saved is highly dependent on additional factors, such as how soon the funding would be available and how it maps to the out-year plans; but if no new funds are available, the resolution of these issues will take longer than desired.

Conclusion

In summary, the NPOESS program is healthy on many fronts. We have a lot of work to do to improve the technical capability and operability of three of our sensor packages, but we know how to do this and work is under way. We have provided more than 30 different scenarios to our government customers on the critical path forward, optimizing cost and schedule considerations. We await their direction to re-baseline this program and move forward. Our Northrop Grumman commitment to NPOESS mission success is solid, and the resources and talent of our professionals are extensive. If asked what I would recommend for this program, I would say that I hope that the government chooses to minimize schedule delays, minimize risk and deliver this critical operational capability into the hands of our warfighters and the severe weather forecasters as soon as is practically possible.

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