Congressional Hearing Testimony
for the
Under Secretary of the Air Force
The Honorable Ronald M. Sega

INTRODUCTION

Mr. Chairman and members of the Committee, I am honored to appear before you today to update you on the status of the National Polar-Orbiting Operational Environmental Satellite System (NPOESS). As I mentioned in the hearing last fall, in my role of overseeing Department of Defense (DoD) space activities as DoD Executive Agent for Space, I am committed to preserving the space capabilities that our commanders and forces depend on to conduct their missions.

NPOESS will be an important addition to the space systems that make swift, effective military actions possible. The program has encountered problems, but we have worked hard to fix them and get NPOESS back on track to deliver the capabilities we need. I am confident that, with the support and guidance of this committee, the NPOESS program will enhance the space-based weather sensing capabilities needed to meet our national security requirements in the coming years.

NPOESS STATUS

Presidential Decision Directive NSTC-2, "Convergence of U.S. Polar-Orbiting Operational Environmental Satellite Systems," written under the auspices of the National Science and Technology Council and dated May 10, 1994, established the NPOESS program and the NPOESS Integrated Program Office (IPO), made up of DoD, Department of Commerce (DoC), and National Aeronautics and Space Administration (NASA) personnel. The IPO formed

in December 1994 to converge the DoD and DoC polar weather satellite requirements—based on the Defense Meteorological Satellite Program (DMSP) and the Polar Orbiting Environmental Satellite (POES), respectively—into a single system. On May 26, 1995, a Memorandum of Agreement signed by the Secretaries of Defense and Commerce and the NASA Administrator established further guidelines for the NPOESS program.

Shortly after I became Under Secretary of the Air Force, the NPOESS Executive Committee (EXCOM) met on August 19, 2005. The NPOESS System Program Director (SPD) briefed the EXCOM on program status and options. The EXCOM was also briefed on the results of an Independent Review Team study of the program. The SPD analysis showed that the program was experiencing development challenges, including at least 15% cost growth. The EXCOM agreed with the SPD analysis that a Nunn-McCurdy notification to Congress should be initiated. On September 28, 2005, a letter from the Acting Secretary of the Air Force was transmitted to Congress.

Also in August 2005, the EXCOM commissioned an Independent Program Assessment (IPA) to review the NPOESS program. The IPA leader, Brigadier General (retired) Jack Wormington, and his team of experts from the Air Force, the National Oceanic and Atmospheric Administration (NOAA), and NASA conducted a thorough and comprehensive review of the NPOESS program. On October 19, 2005, the EXCOM received the interim status briefing from the IPA, which formed the basis of some of the discussion during your committee's hearing on November 16, 2005.

On November 22, 2005, I met with the EXCOM for the third time. During that meeting, the EXCOM received the report from the OSD Program Analysis & Evaluation (PA&E) Cost Analysis Improvement Group (CAIG) that independently assessed the NPOESS program cost.

The EXCOM also took the final outbrief from the IPA, which had looked at several different options, including reducing the number of required sensors on the vehicle, using less-capable sensors, developing a smaller spacecraft bus, as well as evaluating the overall NPOESS management structure. As a result of this assessment, the EXCOM decided to establish a Program Executive Officer (PEO) for NPOESS, reporting to the EXCOM on acquisition matters. The NPOESS SPD would report to the PEO and focus on the day-to-day execution of the NPOESS program, while the PEO focuses on external factors and oversight. Air Force Brigadier General-select (BGen(S)) Sue Mashiko was selected by the EXCOM to be the NPOESS PEO.

After receiving the CAIG cost assessment, the Acting Program Director determined that reasonable cause existed to believe that the program had grown beyond the 25% Nunn-McCurdy threshold, and sent a letter to that effect to the EXCOM on November 30, 2005. Subsequently, the Secretary of the Air Force notified members of both Defense and Commerce oversight committees. The NPOESS Nunn-McCurdy certification process formally began in January 2006, and ran concurrently with the day-to-day execution of the NPOESS program. As prescribed by statute, the Defense Acquisition Executive, Mr. Ken Krieg, launched an extensive program analysis. This collaborative process, conducted with our agency partners NOAA and NASA, involved a rigorous examination of the program consistent with the Nunn-McCurdy process. Mr. Krieg's Nunn-McCurdy certification letters to Congress on June 5, 2006, provide details of the certified NPOESS program.

Since October 2005, the NPOESS IPO has increased the rigor in the oversight and management of the NPOESS program. In conjunction with the prime contractor, the IPO put together an execution plan for FY06. The NPOESS program has been meeting the milestones and technical objectives laid out in the plan, within the budget provided. Significant progress

has been made on the sensors and ground system that support both NPOESS and the NPOESS Preparatory Project (NPP). The engineering development unit of the Visible Imaging Infrared Radiometer Suite (VIIRS) sensor successfully completed vibration testing and is currently in thermal vacuum testing. A successful completion of thermal vacuum testing will be a significant milestone in the acquisition of VIIRS, and will demonstrate the feasibility of the VIIRS design. The other NPOESS sensors that will support the NPP mission are making significant progress as well, with the Cross-track Infrared Sounder and Ozone Mapping and Profiling Suite flight units built and in acceptance testing today. NPOESS ground system risk reduction efforts and software development have also shown solid progress. We are encouraged by the progress in the NPOESS program during the last six months while the Nunn-McCurdy certification process took place, due in part to the EXCOM-directed reorganization,. We will keep the committee apprised of the status of this program.

AVOIDING COVERAGE GAPS

As the Nunn-McCurdy team evaluated the NPOESS program, a guiding principle was to minimize the risk of a continuity gap between NPOESS and DMSP, POES, and the Earth Observing Satellite (EOS) Aqua mission. Maintaining polar coverage with the right sensor capabilities is vital to the future of our weather forecasting. The DoD Joint Requirements Oversight Council (JROC), augmented by senior representatives from NOAA and NASA, reviewed the requirements for the NPOESS program. Additionally, the Senior User Advisory Group (SUAG), composed of members from NOAA, NASA and DoD, also reviewed the capabilities that each NPOESS satellite should possess, given the required orbits.

The Air Force is responsible for weather forecasting for global military operations, including coverage of areas from which data are usually unavailable or denied. DMSP is a key source of data to accomplish the military forecasting mission. It provides data on cloud cover, temperature and water vapor profiles, soil conditions, sea conditions, sea ice coverage, and auroral extent. DMSP also provides the necessary spatial resolution to support critical military operations. NPOESS will improve the quality of the data available for forecasting. Polar-orbiting satellites such as DMSP and NPOESS are critical because geostationary data is of lower spatial resolution and cannot effectively cover latitudes higher than 50 degrees—yet conditions at high latitudes are major drivers of worldwide weather. NPOESS, as the replacement for DMSP, is necessary to support national security objectives.

GETTING NPOESS ACQUISITION "BACK TO BASICS"

DoD space acquisitions programs are getting "back to basics" to maximize our probability for success. We believe focusing on acquisition and engineering basics should benefit the NPOESS program as it moves forward.

Acquisition links technology with operations—it turns ideas into real, tangible items and delivers those items to the field. The "back to basics" approach views acquisitions as a continuous process with four distinct but interrelated stages. The first stage is Science and Technology (S&T), where we conduct basic research and explore the possibilities of new technologies. In the second, Technology Development, we evaluate the utility of discoveries made in the S&T stage. The third stage is Systems Development. Here, we take the most promising technologies and mature them to higher readiness levels so they can be integrated into operational platforms in the fourth stage, System Production.

In this acquisition construct, technology is matured through the four stages to move from the lab bench to the test range and then to operations. We are emphasizing early technology development to ensure mature technology is available for our production systems.

Basic research in science and technology generates knowledge and helps develop our scientists and engineers in our laboratories, universities, and research centers. This kind of cutting-edge work is inherently high risk, but we want to take risk in the earlier stages, not in the later stages. The DoD has been moving in the direction of increased emphasis on S&T for some time now; for example, our investment in space-related S&T has doubled over the last four years.

Once we find a promising technology, we investigate its utility in the Technology Development stage. Thus, in the two supporting stages of Technology Development and Science and Technology, the approach is to take more risk and push the frontier harder.

After we prove a concept or demonstrate the technology, "back to basics" demands that we mature it until we are confident it will work reliably in space. We build that confidence and performance during the Systems Development stage, where we get new technologies ready to incorporate into operational systems.

Finally, once we have mature technology, we move into the fourth stage, System Production. In this final stage, we want to integrate mature technologies while employing a disciplined systems engineering process. We must also incorporate testability and modularity in the design, so we have a path to include newly matured technologies into operational systems in future versions. We will reduce the risk involved in this stage by starting with more matured technologies, more stable requirements, and more discipline in the systems design.

This approach manages, or apportions, risk by accepting higher risk in those beginning stages; it lowers the risk in System Production by incorporating only proven technologies and taking smaller, more manageable steps. By doing so, we allow a constant, on-going rhythm of design, build, launch, and operate that should reduce the cycle time for space product acquisition, insert stability into our production lines and workforce, and enable us to field better systems over time. This approach will deliver timely, affordable capability to the warfighter while increasing confidence in our production schedule and cost.

The NPOESS program has the potential to benefit from this approach, and could implement it through major discrete increments or "blocks." The block approach is enabled by the inherent flexibility designed into the NPOESS spacecraft bus in weight, power, and the nadir deck; thus, the bus has room for growth of payload. Under a block approach, core capabilities would be provided in the first block of satellites; additional payloads could be integrated into later satellite blocks, and higher performance technical capabilities may be incorporated after the technologies have matured. The certified NPOESS program reduces technology and integration risk and increases our confidence levels in timely delivery of core capabilities to the warfighter. These core capabilities were identified by the Senior User Advisory Group (SUAG), composed of members from NOAA, NASA and DoD, and subsequently approved by the DoD Joint Requirements Oversight Council (JROC), augmented by senior representatives from NOAA and NASA. We are applying the back-to-basics acquisition approach to the restructured NPOESS program by including a complement of sensors in the program to provide these core capabilities. These sensors include: Visible/Infrared Imager/Radiometer Suite (VIIRS); Microwave Imager/Sounder; Search and Rescue Satellite Aided Tracking (SARSAT); Cross-track Infrared Sounder (CrIS); Advanced Technology Microwave Sounder (ATMS); Advanced Data Collection

System (ADCS); Cloud's and Earth's Radiant Energy System (CERES); Ozone Mapping and Profile Suite (OMPS) Nadir; and Space Environment Monitor (SEM).

This back-to-basics approach also hinges on strengthening collaborations between the players involved in the acquisition and requirements process, implementing more rigorous systems engineering processes, and improving the way we recruit and train our acquisition workforce. The NPOESS program should benefit from our efforts to strengthen collaboration across the space community between technical experts, acquisition personnel, weather forecasters, scientists, maintainers, and operators. NPOESS also should benefit from this emphasis on applying proven systems engineering practices such as developing sound, stable, system requirements, and better cost and schedule estimation. Finally, NPOESS should benefit from our efforts to raise the expertise of our systems engineers—and especially from the installation of experienced program managers like BGen(S) Mashiko.

CONCLUSION

I appreciate the continued support and dedication of the Congress and this Committee to deliver vital capabilities for national security. I look forward to working with you as we complete the NPOESS system and ensure that we have the forecasting and remote sensing capabilities that our nation needs.