

**WRITTEN TESTIMONY OF  
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U.S. DEPARTMENT OF COMMERCE**

**OVERSIGHT HEARING ON THE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION'S  
GEOSTATIONARY WEATHER SATELLITE SYSTEM**

**BEFORE THE  
COMMITTEE ON SCIENCE AND TECHNOLOGY  
SUBCOMMITTEE ON ENERGY AND ENVIRONMENT  
U.S. HOUSE OF REPRESENTATIVES**

**APRIL 23, 2009**

**Introduction**

Mr. Chairman and members of the Subcommittee, I am Mary E. Kicza, Assistant Administrator of the National Environmental Satellite, Data, and Information Service (NESDIS). NESDIS is part of the National Oceanic and Atmospheric Administration (NOAA), within the Department of Commerce. NOAA's mission is to understand and predict changes in Earth's environment and conserve and manage coastal and marine resources to meet our nation's economic, social, and environmental needs.

I appreciate the opportunity to discuss with you today NOAA's environmental satellite programs and to highlight their importance to our hurricane and other severe weather forecasting and warning capabilities. NOAA has made significant progress in the development of the next generation Geostationary Operational Environmental Satellites R Series (GOES-R) program since the last hearing on this topic on October 23, 2007.

NOAA's satellite acquisitions are complex and difficult development efforts. I will be the first to acknowledge that it is a challenge to build the complex satellites that are required to meet the requirements of our customers and users. However, NOAA has implemented several changes to strengthen the program control processes within our satellite development programs in response to lessons learned from programs including the National Polar-orbiting Operational Environmental Satellite Systems (NPOESS) and from the recommendations of outside reviewers, such as the U.S. Government Accountability Office (GAO).

**What are Geostationary Satellites?**

NOAA has operated geostationary operational environmental satellites (GOES) since the 1970s. These satellites are located more than 22,000 miles above the equator and provide near continuous images and data on atmospheric, oceanic, and climatic conditions over the continental United States and Hawaii. These satellites are best known for creating the hurricane pictures you see on television, but they also provide the data to help forecast the weather and are critical to detecting and tracking severe weather.

We operate two geostationary satellites, one over the east coast and the other over the west coast. To protect against a loss of satellite coverage, we maintain a spare satellite in space that can be repositioned and brought out of storage to take the place of a failed satellite. Given the importance of the data from these satellites, continuity of operations remains our highest priority.

### **Status of the Current GOES Constellation (GOES I-M and GOES-N Series)**

Individual GOES satellites have a letter designation through their development until they are launched, placed in orbit, and have completed a rigorous checkout procedure. They are then given numeric designations for their operational lifetimes. The operational satellites in space now, GOES-11 and GOES-12, are the last two satellites of the GOES I-M series.

The next series of geostationary satellites is called GOES-N, and this series consists of the same instruments as the GOES I-M series. The first of the GOES-N series satellites was launched in May 2006 and is currently serving as the on-orbit spare. The final two satellites from this series are GOES-O and GOES-P, with GOES-O scheduled to launch later this year.

### **What is the GOES-R Series?**

GOES-R is a joint development and acquisition effort between NOAA and the National Aeronautics and Space Administration (NASA) as documented in a jointly signed Memorandum of Understanding and Management Control Plan. The GOES-R series will replace the GOES-N series and extend geostationary capabilities through FY 2028.

GOES-R will provide forecasters and scientists with a new suite of improved instruments. These new instruments will enhance our current capability to track and monitor severe weather on Earth with improved imagery and scan rates. Additionally, solar environmental monitoring instruments will provide advances for space weather forecasting. GOES-R will provide more timely and accurate weather forecasts and improve the detection and observations of severe weather events that directly affect public safety, protect property, and, ultimately support the country's economic health and development.

Under a multi-contract acquisition strategy, NASA will procure the space segment (including spacecraft and instruments) and NOAA will procure the ground segment (including the ground system that will conduct satellite operations and environmental product generation and distribution) for the GOES-R program. The GOES-R planned launch is April 2015; however, delays in the spacecraft procurement may impact the launch date. The GOES-R program will analyze the impact to planned launch dates once the spacecraft and ground contracts are awarded and underway.

The GOES-R program is budgeted for two satellites and a supporting ground system and has unfunded options for two additional satellites. GOES-R instruments include an Advanced Baseline Imager (ABI), the main imaging sensor for the satellite; solar instruments, including the Extreme Ultraviolet and X-ray Irradiance Suite (EXIS) and Solar Ultraviolet Imager (SUVI); a Space Environment In-Situ Suite (SEISS); and a new Geostationary Lightning Mapper (GLM), which will monitor lightning strikes to enhance severe weather prediction. The spacecraft will also host a magnetometer.

The imagery improvements provided by the ABI and the addition of the GLM to the GOES instrument suite will lead to improved observations, forecasts, and warnings for a host of environmental hazards, including severe thunderstorms, tornadoes, hurricanes, lightning, flash floods, winter storms, fog, forest fires, and poor air quality.

The ABI Prototype Model (a model built to test the design of the sensor before the first instrument for flight is assembled) is now being integrated by the instrument contractor, ITT Corporation (ITT). Testing of the prototype model will proceed through the end of the year, while ITT begins development of the first flight model during the next year.

The GLM instrument contract was awarded to Lockheed Martin Advanced Technologies Corporation in December 2007. The instrument's Preliminary Design Review was successfully conducted earlier this year, and the instrument is now in its detailed design phase. The remaining instruments have all had successful Preliminary Design Reviews and are also in the detailed design phase. (Appendix 1 includes additional information about instrument development.)

### **Status of GOES-R Spacecraft Acquisition**

On December 4, 2008, the GOES-R program awarded the spacecraft contract to Lockheed Martin Space Systems Company to build two spacecraft for the GOES-R program. The total estimated value of the basic contract including the two options is \$1.09 billion. The basic contract is for two spacecraft with two unfunded options that each provide for one additional spacecraft.

On December 15, 2008, Boeing Satellite Systems filed a protest with GAO against the GOES-R spacecraft contract award to Lockheed Martin Space Systems Company. On February 17, 2009, NASA requested GAO dismiss the protest based on NASA's decision to re-evaluate the proposals and make a new award decision. On February 19, 2009, GAO dismissed the protest. After the protest was dismissed, the Source Evaluation Board (SEB) reconvened to re-evaluate the proposals of Lockheed Martin and Boeing. The contract remains suspended until a new award decision is announced, which is currently planned for May.

### **Status of GOES-R Ground Systems Acquisition**

The GOES-R Program Office is working toward awarding the GOES-R ground segment contract in June 2009. The ground segment will maximize use of well proven technologies for its

systems. Scientific algorithm development to develop new environmental products from GOES-R series satellite data will be performed by an experienced NOAA science team partnered with university-based cooperative institutes and NASA scientists.

### **Ongoing GAO Review of the GOES-R Program**

GAO has provided regular reviews of our GOES-R Series acquisition for many years and we appreciate the perspective the GAO professionals provide. We have met with GAO and provided information and feedback on its most recent report. I will summarize this information for you today.

I am pleased the GAO report recognizes we have taken steps to apply the lessons learned from other satellite programs to the procurement of GOES-R. I understand we have more work to do to improve the overall management of these complex and high risk programs, and the joint NOAA/NASA team is fully committed to making these improvements.

Specifically, the GAO provided three recommendations:

**Recommendation number one:** *As part of any effort to rebaseline the cost and schedule of the Advanced Baseline Imager, perform an integrated baseline review and ensure the review includes an assessment of key schedule milestones, the adequacy of resources, task and technical planning, and management processes.*

NOAA agrees with this recommendation. NOAA will perform an integrated baseline review on the Advanced Baseline Imager as part of any effort to rebaseline its cost and schedule. The integrated baseline review will include assessment of the technical scope of the work, key schedule milestones, the adequacy of resources, task and technical planning, and management processes. There is no near-term plan to rebaseline ABI at this time.

**Recommendation number two:** *Improve the agency's ability to oversee contractor performance by ensuring the reasons for cost and schedule variances are fully disclosed and documented.*

NOAA agrees with this recommendation. GOES-R contractors submit monthly Cost Performance Reports with itemization of all variances. The GOES-R program office will ensure these cost and schedule variances reported by the contractor are elaborated upon as needed for full understanding and disclosure. Also, the GOES-R program office will fully document the actions taken to address significant cost and schedule variances, along with the reasons for and impact of those actions.

**Recommendation number three:** *If feasible and justified, develop a plan and timeline of recovering the advanced capabilities that were removed from the program when the Hyperspectral Environmental Suite was cancelled.*

NOAA agrees with this recommendation. NOAA will identify and validate user requirements, evaluate the priority of addressing those requirements against the technical feasibility of meeting those requirements, and determine the most appropriate methods to meet them.

### **Conclusion**

I appreciate the Committee's continued interest in NOAA's satellite programs. It is widely acknowledged satellites are very complicated and difficult systems to design, build, and operate. However, their capabilities play a role in NOAA's mission to observe and predict the Earth's environment and to provide critical information used in protecting life and property.

We are making significant strides in developing a better process for designing and acquiring our satellites. We have fully functioning operational satellites with backup systems in place, and we are working on the next generation that will provide significant improvements in our ability to forecast the weather and other environmental phenomena. I would be happy to answer any questions you may have.

## Appendix 1

### GOES-R Instrument Status

- **Advanced Baseline Imager (ABI)**
  - Implementation phase
  - Contractor: ITT Corporation, Ft. Wayne, IN
  
- **Space Environmental In-Situ Suite (SEISS)**
  - Implementation phase
  - Contractor: Assurance Technology Corporation, Carlisle, MA
  
- **Extreme Ultra Violet /X-Ray Irradiance Sensor (EXIS)**
  - Implementation phase
  - Contractor: Laboratory for Atmospheric and Space Physics, Boulder, CO
  
- **Solar Ultra Violet Imager (SUVI)**
  - Implementation phase
  - Contractor: Lockheed Martin Advanced Technology Corp, Palo Alto, CA
  
- **Magnetometer**
  - To be procured as part of spacecraft contract
  
- **Geostationary Lightning Mapper (GLM)**
  - Implementation phase
  - Contractor: Lockheed Martin Advanced Technology Corp, Palo Alto, CA