

## Evolved Expandable Launch Vehicle (EELV)

The Evolved Expandable Launch Vehicle (EELV) program fulfills government satellite launch requirements currently served by Delta II, Atlas II, Titan II, and Titan IV. The EELV will be DoD's only medium, intermediate, and heavy payload space launch capability after current heritage inventories are exhausted. FY03 marked the transition to the new launch vehicle, which is expected to provide launch services through 2020.

The government intends to maintain an ongoing competition between two contractors, Boeing and Lockheed Martin, rather than down-selecting to one. Boeing's EELV family of launch vehicles is designated the Delta IV, and Lockheed Martin's family the Atlas V. DoD will acquire launch services from these contractors. Production and launch operations responsibilities, as well as ownership of all EELV flight hardware and launch pad structures, will remain with the contractor. DoD will lease launch pad real property and other on-base facilities required for operations to the contractors. The contractors have shared development costs with the government to satisfy both DoD civil launch requirements and commercial launch needs.

The EELV system includes launch vehicles, infrastructure, support systems, and interfaces. The contractor is standardizing payload interfaces, launch pads, and infrastructure so that all configurations of each contractor's EELV family can be launched from the same pad and payloads can be interchanged between vehicles in the same class (i.e., medium, intermediate, or heavy). The EELV program will maintain current mass-to-orbit capability while increasing launch rate and decreasing costs. Potential savings will be generated through the commercial launch market and shared development by government and commercial customers.

### TEST & EVALUATION ACTIVITY

FY03 DOT&E activity consisted of:

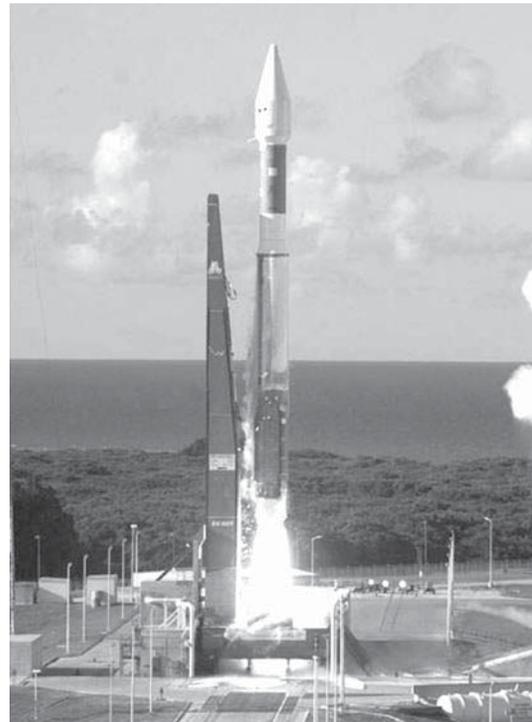
- Attendance at several wet dress rehearsals.
- Participation in the Program Office-run Flight Readiness Reviews that occur before each launch.
- First-hand observation of launch day activities (sitting on console with ability to hear contractor communications).
- Witnessing EELV launches including spacecraft separation.
- Participation in both the contractor-run post-launch data reviews and the Special Programs Office-run post launch briefings.

DOT&E also participated in Test Integrated Product Team meetings, with the goal of updating the September 1998 Test and Evaluation Master Plan and ensuring critical documentation and data are available for independent review and analysis.

The Air Force Operational Test and Evaluation Center (AFOTEC) conducted an EELV operational assessment (OA) II from April 2001 to December 2002 to support the first government launch.

### TEST & EVALUATION ASSESSMENT

There do not appear to be any insurmountable problem areas affecting the EELV program as a whole. Both the Atlas V and Delta IV boosters have launched successfully. Post-flight analyses for the launches indicate that first and second stage



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engine performance and orbital insertion were nominal. Further, both contractors' vehicles have successfully flown with solid boosters strapped to the main booster.

AFOTEC completed OA II on December 18, 2002, and found the system to be a potentially effective and potentially suitable launch service which can support the requirements of the National Launch Forecast. Areas that were rated as making satisfactory progress with qualifications included vehicle design reliability; logistics supportability; and a number of payload interfaces. OA II supported the Air Force Space Command's launch readiness review for the first government payload launch, a Defense Satellite Communications System payload launched March 11, 2003.

Since OA II marked the end of AFOTEC's EELV test program involvement, DOT&E arranged for additional system performance analysis through a detailed test plan laid out in the 2003 Test and Evaluation Master Plan. Specifically, DOT&E will be involved in a final operational test phase that will encompass several launches presently planned for each contractor, and should include medium launch vehicles, heavy lift vehicles, and East Coast and West Coast launches. This final phase of operational testing has been identified as the Post-OA-II operational evaluation (POE).

This POE concept relies almost exclusively on combined developmental/operational testing. Due to the current acquisition strategy, there are no further scheduled dedicated operational test events. The test strategy includes extensive use of models and simulations to predict individual subsystem and total system performance. Despite the commercial involvement in the program, the government needs to evaluate system effectiveness and suitability and how well the system can support DoD missions.