

ATK Seeks NASA Funding for New 4-Stage Rocket

BRIAN BERGER, WASHINGTON

Alliant Techsystems (ATK) is asking NASA to partially underwrite development of a four-stage rocket that would be designed to boost space station supplies and science satellites into orbit.

Pitched as a lower-cost alternative to the Delta 2 rocket, the expendable launch vehicle ATK has proposed to NASA would leverage the Minneapolis-based company's experience building solid-rocket motors.

The first two stages are based on existing propulsion systems that have long flight heritage. The first stage is a new 2.5-segment version of the four-segment space shuttle solid-rocket boosters ATK builds for NASA. The second stage is the ATK Castor 120, first used on Lockheed Martin's Athena family of rockets and still in use today as the main stage of the Taurus rockets built and operated by Orbital Sciences Corp. of Dulles, Va.

The third stage is a Castor 30 motor ATK says it has been developing internally for two years. The fourth stage is a Lockheed Martin-supplied orbital adjustment module that flew on both the Athena 1 and Athena 2 rockets.

Joel Crook, launch vehicle program director for advanced programs at ATK Launch Systems Group, said in an interview that by leveraging largely flight-proven hardware, ATK's proposed solution to NASA's launch needs offers both low development risk and substantial operations savings over Delta 2.

Although Delta 2 is one of the most reliable rockets in service with more than 70 successful launches to its credit, it has grown more expensive in recent years. Prices are projected to rise sharply once the U.S. Air Force takes leave of the program in 2009, leaving NASA to shoulder the expense of maintaining dedicated Delta 2 launch pads in California and Florida. NASA said last year it likely would follow the lead of the U.S. Air Force and transition its medium-class launch traffic to United Launch Alliance's Evolved Expendable Launch Vehicles.

Crook said solid-fueled rock-



The photo above shows existing flight propulsion hardware that ATK proposes to use on a rocket to launch space station supplies and science satellites into orbit.

ets, with their simpler ground infrastructure requirements, are cheaper to operate than existing or proposed liquid-fueled rockets. "The military realized this decades ago and that's why all of our tactical and strategic propulsion systems are solid based," Crook said.

While the Delta 2-class payload is one of the markets ATK is targeting with its proposed new launch offering, the company's near-term focus is on helping NASA resupply the space station once the space shuttle retires in 2010.

The company already has leveraged its experience building space shuttle solid-rocket boosters to win a \$1.8 billion contract to build the five-segment main stage of NASA's Ares 1 crew launch vehicle.

Now ATK is hoping that NASA will select the proposal it submitted last year as a subcontractor to Chicago-based PlanetSpace to use \$175 million available under the Commercial Orbital Transportation Services (COTS) program to build the four-stage rocket and demonstrate its utility as a space station resupply vehicle. Teammate Lockheed Martin Space Systems of Denver — prime contractor for NASA's Ares 1-launched Orion Crew Exploration Vehicle — would build a modular cargo carrier for the PlanetSpace system.

The ATK rocket is designed to lift 6,002.4 kilograms of payload to the space station and roughly 2,812.3 kilograms to a geosynchronous transfer orbit, accord-

ing to an ATK fact sheet.

Crook said an upgraded version of the rocket featuring upgraded solid propellant and a composite case in place of the heavier steel used today would provide an additional 707.6 kilograms of payload capability to the space station. What's more, Crook said, the improvements would be applicable to the Ares 1 should NASA decide it wants to get more lift out of that vehicle.

PlanetSpace Chairman Chirineev Kuthuria, a telecommunications mogul who invested millions of dollars to privatize Russia's Mir space station before it was described in 2001, said in an interview that in addition to the COTS money, PlanetSpace would need to raise about \$500 million in private financing in order to build its proposed system and conduct its first space station-bound demonstration by December 2010. He said the company has \$200 million in private commitments in addition to \$50 million in public aid it has secured in the United States and Canada for the launch system and some of the firm's sub-orbital ventures.

Kuthuria said he believes investors will be willing to back a venture that has NASA's endorsement in the form of a COTS award and the technical know-how of two firms like ATK and Lockheed Martin.

Oklahoma City-based Rocketplane Kistler also had NASA's endorsement and technical backing from ATK, Northrop Grumman, Aerojet and Lockheed Martin.

But after winning one of two original COTS awards NASA made last year, the company struggled to raise the \$500 million it needed to finance its proposed space station-resupply solution, leading NASA to terminate Rocketplane Kistler's COTS agreement last October.

Al Simpson, Lockheed Martin Space System's director of advanced human spaceflight programs, told *Space News* the PlanetSpace team is taking a different approach than Rocketplane Kistler.

"They tried to do something a little more clean sheet," Simpson said of that Rocketplane's K-1 reusable rocket. "What makes a difference here is we are starting with a lot of heritage hardware. To do what NASA is asking you just don't want to start with a clean sheet. You want to leverage as much as possible."

Simpson said the PlanetSpace team is not just leveraging ATK's propulsion heritage. The modular cargo carrier Lockheed would be responsible for building pulls in technologies from the XSS-11 proximity operations demonstration it did for the Air Force, the Genesis sample-return mission it did for NASA as well as the Mars Science Laboratory lander mission still in development and the company's Orion work.

ATK is not the only company looking to solve NASA's space station resupply quandary and Delta-2 dilemma with the same launch vehicle.

Space Exploration Technologies, the recipient of a \$278 mil-

lion COTS award next year, is hard at work on the Falcon 9, which is designed to lift 9,900 kilograms to low Earth orbit for \$35 million. A heavy-lift version the company plans to build could lift up to 12,000 kilograms to geosynchronous transfer orbit for \$90 million, according to the Hawthorne, Calif.-based company's Web site.

Orbital Sciences, meanwhile, says it is ready to self-finance a Delta 2-class entrant called the Taurus 2 provided it sees a sufficient market. The company was one of eight or more firms to submit a COTS proposal last November, but has said little publicly about their proposed space station resupply solution.

"We're not trying to win a contract through the media," Orbital Sciences spokesman Barron Beneski said Jan. 17. "We are trying to win the contract through high quality engineering and innovative ideas."

Meanwhile, Denver-based United Launch Alliance — maker of the Delta 2 and the much larger Atlas 5 and Delta 4 rockets — said it is not ready to forfeit the medium-class launch market. In a Jan. 17 interview, George Sowers, United Launch Alliance vice president of business development, said the company has no plans to retire Delta 2 from service. However, he acknowledged the Delta 2 program faces challenges in light of the Air Force's plan to take leave of the program next year after launching its final second-generation GPS satellite, and NASA is planning to follow suit.

"It's kind of a perfect storm from a market standpoint in that two of the anchor tenants have kind of gone away," he said.

Sowers said United Launch Alliance thinks it likely NASA's demand for medium-lift vehicles will rebound in the near future as the United States puts a higher priority on launching climate-monitoring satellites and other science-oriented spacecraft.

"Similarly, on the national security side we are seeing some signs of resurgence of interest there," Sowers said.

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Finalists Selected for NASA Space Station Resupply Demonstrations

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NASA has narrowed the field of private space companies vying for the \$175 million in public funds the U.S. space agency expects to award in early February for demonstration flights to the international space station, according to industry sources closely following the competition.

At least eight firms — and perhaps as many as 14 — submitted proposals in late November under the Commercial Or-

bitral Transportation Services (COTS) program, sources said.

Established in 2006, the COTS program was created to spur the development of privately operated space transportation systems capable of delivering cargo and eventually astronauts to the space station.

In mid-2006 NASA selected two companies, Space Exploration Technologies Corp. and Rocketplane Kistler (RpK), to share about \$500 million. But NASA subsequently pulled the

plug on RpK's award, concluding the company had not lived up to the terms of the agreement the company signed with the agency. That freed up the \$175 million NASA intends to give to some other company next month.

According to multiple industry sources, NASA has notified four companies that they are finalists for the \$175 million. The four have been told to be prepared to meet soon with COTS selection officials in Hous-

ton to defend their proposals.

Spacehab was one of the companies notified the week of Jan. 14 that it had made the cut, Eva DeGardenas, a spokeswoman for the Houston-based company, confirmed Jan. 17.

The other companies, according to sources are: Andrews Space of Seattle, Orbital Sciences of Dulles, Va., and PlanetSpace of Chicago.

NASA spokeswoman Beth Dickey would not confirm that a downselect had taken place,

noting that the COTS competition still is under way.

Industry sources said NASA intends to announce its final selection Feb. 7, the date by which the U.S. Government Accountability Office is required to rule on RpK's challenge of NASA's use of Space Act Agreements for the COTS program. RpK maintains that a traditional federal contract would be a better fit for COTS.

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