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THE LONG COUNTDOWN

# The Fight Over NASA's Future

By [JOHN SCHWARTZ](#)

[NASA](#) has named the rocket Ares I, as in the god of war — and its life has been a battle from the start.

Ares I is part of a new system of spacecraft being designed by the National Aeronautics and Space Administration to replace the nation's aging space shuttles. The Ares I and its Orion capsule, along with a companion heavy-lift rocket known as the Ares V, are meant for travel to the [Moon](#) and beyond.

Technical troubles have dogged the design process for the Ares I, the first of the rockets scheduled to be built, with attendant delays and growing costs. And in an age of always-on communication, instant messages and blogs, internal debate that once might have been part of a cloistered process has spilled into public view.

Some critics say there are profound problems with the design that render the Ares I dead on arrival, while other observers argue that technical complications crop up in any spacecraft development program of this scope.

The issues have become a focus of the members of the presidential transition team dealing with NASA, and the space program could undergo a transformation after [Barack Obama](#) takes office.

During his campaign, Mr. Obama expressed support for NASA and criticized the five-year gap between the scheduled end of the space shuttle program in 2010 and the planned debut of the first components of the new system, which NASA has given the overall name Constellation, in 2015. (During the pause in American flights — a Bush administration plan to conserve money during the development process — the United States will depend on Russia and its [Soyuz](#) spacecraft for trips to the International Space Station.)

But NASA, which has a \$17 billion annual budget and most likely would face higher expenses if the gap is to be narrowed and the new program kept on track, will be competing for money as the new administration faces urgent and expensive crises.

The Obama transition team, in meetings and requests for information from NASA, contractors and others with a stake in the process, has asked whether increased financing can narrow the five-year flight gap by speeding development of the new spacecraft. The advisers have also asked what the costs and consequences might be of continuing to fly the shuttles for at least one or two additional flights, or even to keep flying them until the next system is ready.

The team has also asked whether the development program is truly in trouble and, if so, whether the Ares I should be modified or replaced by rockets used by the Air Force to launch satellites, or the Ariane 5 rocket from Europe.

While some involved in developing the rockets have read volumes into the questions, a spokesman for the transition team, Nick Shapiro, said that “the role of the agency review teams is not to make recommendations on any of the issues they are reviewing. They are fact-finding and preparing the full range of options for consideration by the incoming appointees.”

Nonetheless, tensions have increased between the incoming administration and the management of NASA, whose administrator, Michael D. Griffin, is fighting to keep the program on course. If he is not reappointed by Mr. Obama, his term will end Jan. 20.

John Logsdon, a space historian at the [Smithsonian Institution](#), said Mr. Griffin was fighting for a program “which he’s put his whole reputation on.” On the other hand, Dr. Logsdon said, a new president needs to press and probe. “Any administration making a choice that’s going to last for a generation needs to make that choice for itself,” he said.

## A New Direction

In an enormous barnlike building at the Kennedy Space Center earlier this year, officials proudly showed off a prototype of the heat shield of the new Orion capsule, a rounded disc some 15 feet across. Startlingly large but oddly prosaic — it looked like nothing so much as a gigantic muffin top — it served as a powerful symbol for those at the space center. It meant the first pieces of test hardware were moving from computer screens to reality.

Metal, as they say, is being bent.

President Bush announced the new direction for the space program in January 2004, nearly a year after the loss of the shuttle Columbia underscored the risks inherent in the spacecraft — especially the potential for debris to strike it during launching. In 2005, NASA lifted the curtain on the Constellation program, with the Orion capsule that would ride on top of its rocket, Ares I, out of the way of launch debris. It would be capable of carrying six astronauts; Apollo held three.

The Ares rockets are very different — both from the shuttle and each other.

Ares I, uses as its first stage a lengthened solid rocket booster like the ones used by the shuttle. The second stage is a rocket that will burn liquid hydrogen and liquid oxygen, as the shuttle's main engines do. Atop the stack will sit the Orion capsule.

The first test of an unmanned Ares I could take place next summer. The test, however, will use a spacecraft that is very different from the Ares I to come. It will involve a solid rocket booster of the same length that the shuttle uses, and the second stage and capsule will be dummies. Four more test flights are scheduled before the rocket is used beginning in 2015.

The Ares V is a much brawnier rocket designed to send equipment to the Moon and beyond. Its first stage includes two solid rocket boosters and a liquid-fueled set of six rocket engines.

The design process has run into technical problems. Orion is far heavier than the Apollo capsule and weight issues have required redesigns of both the capsule and the rocket, further complicating technical issues. Engineers have also had to come up with ways to dampen potentially dangerous vibrations along the shaft of the rocket as the solid rocket engine empties.

Some inside the development program have complained that it is run with a my-way-or-the-highway attitude that stifles dissent and innovation. Jeffrey Finckenor, an engineer who left NASA this year, sent a goodbye letter to colleagues that expressed his frustrations with the program. "At the highest levels of the agency, there seems to be a belief that you can mandate reality," he wrote, "followed by a refusal to accept any information that runs counter to that mandate." The letter was posted to the independent NASA Watch Web site.

Mr. Finckenor has refused to comment further.

Leroy Chiao, a retired astronaut who flew three shuttle missions and served aboard the space station, said that the 2004 announcement by Mr. Bush of NASA's new direction "was a time of great optimism." Mr. Chiao is not involved with the Constellation project today, but he said it was clear from some of the leaked discussions that "the program has not panned out as I, and the vast majority of people, had hoped."

### Sunny Assessments

NASA officials say the Constellation program is actually coming along well. In an interview in November, Mr. Griffin said, "I can't imagine somebody thinks you're going to develop a new space transportation system and encounter no challenges." The ones NASA is encountering, he said, are "routine in the extreme."

Douglas R. Cooke, a leading space agency official on the Constellation program, told reporters this month that the weight and vibration issues were well on their way to being fixed. And Neil

Otte, the launching chief engineer for the Constellation rockets, said that solving tough problems was what engineers did for a living. When they encounter a particularly difficult challenge, he said, their attitude is, “Hey, it’s starting to get fun now, and we’re earning our money.”

Nonetheless, the chorus of naysayers that has arisen online, and even within NASA, often has a favorite alternative in mind. There is momentum behind using Atlas and Delta rockets developed for satellite delivery, which proponents say could quickly be fitted with the Orion capsule.

Mr. Griffin has proposed using satellite launchers for human flights in the past, a process known as “human rating” that involves upgrades to the safety and reliability of the craft. This year, he told French lawmakers that it would be a “small step” from today’s French Ariane 5 rocket, which has launched a cargo craft to the International Space Station, to “an independent European human spaceflight capability.” But he opposes the plan to use the military rockets and has said that the switch would lead to delay and cost increases while risking safety.

Mr. Otte said using military rockets would be far more complex than simply putting a capsule on top of off-the-shelf equipment. Rockets built for satellites would have to be extensively modified before putting humans aboard.

A second group of engineers favors plans for a follow-up system, called Direct 2.0, that is drawn largely from old NASA plans that had been abandoned. Ross Tierney, a spokesman for the group pushing Direct 2.0, said, “Let’s have an independent review and check them all out.”

“We’re confident of what the numbers are going to be, and that we’ll come out on top,” he said.

But that concept has gained few followers, and in April, Richard Gilbrech, NASA’s associate administrator for exploration systems at the time, testified before the House Subcommittee on Space and Aeronautics that “we can’t justify, based on laws of physics, the performance” claimed by the plan’s proponents.

Edward F. Crawley, a senior professor of aeronautics and astronautics at the [Massachusetts Institute of Technology](#), said that the Ares I was not perfect, but that when seen in the context of its use of components from the shuttle program, military systems and the coming Ares V, it was the product of sensible choices. “I don’t have any reason to believe there are major technical issues to block its success,” he said.

Building a new rocket “is a hard thing,” Dr. Crawley said, and initial test flights often end in embarrassment or even disaster because everything in a very complex system has to go right. “It’s one strike and you’re out,” he said. “If you put every day of its development under a microscope, you’ll find plenty of things to write about.”

## To Keep Flying or Not

When Mr. Obama decides what to do about space, he might also decide to narrow NASA’s five-year flight gap simply by flying the space shuttles past the Bush administration’s 2010 deadline.

Pressure has grown to keep the shuttles flying. In July, former Senator [John Glenn](#) of Ohio said in testimony before the House Science and Technology Committee that he favored flying the shuttles until the Constellation craft were ready to fly. “I never thought I would see the day when the world’s richest, most powerful, most accomplished spacefaring nation would have to buy tickets from Russia to get up to our station,” said Mr. Glenn, the first American to orbit the [Earth](#).

Continuing shuttle flights has also been proposed by the New Democracy Project, a group with strong ties to [John D. Podesta](#), a co-chairman of the Obama transition team.

To Mr. Griffin, though, such proposals threaten to scuttle the new space program by hijacking billions of dollars that could go to Constellation development. He also argues that the shuttle’s considerable risks make it unsafe to continue flying it. In an interview in November, Mr. Griffin defended the program he has put in place.

“U.S. civil space policy, in terms of its goals, was headed in the wrong direction after the Nixon administration,” he said. Today, with the nation talking about going back to the Moon, exploring near-Earth asteroids and even going to Mars, “that’s the right path for us to be investing in,” he said.

Dr. Crawley of M.I.T. said he would like to see a panel of “unbiased and wise people” under the new administration weigh NASA’s plans against the alternatives while keeping in mind the broad range of budgetary, workforce and technical issues. “I don’t frankly know what the answer is,” he said, “but I know it’s a lot closer and a lot more complicated answer than the one playing out in the media and the blogs.”

And then, Dr. Crawley said, get on with it. The space program’s \$17 billion annual budget is small in comparison with other elements of the nation’s spending. But its payoff, he noted, can be big. If the new president seeks to stimulate the economy with “domestic high-technology jobs that provide stable and rewarding employment,” he said, “space would be a well-placed investment.”

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