



COMMENTARY

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Minding the Gaps: Keeping Exploration Alive

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It is clear that the Vision for Space Exploration (VSE) has become a truly national vision. With the first announcement of the VSE by President George W. Bush in January 2004, the United States' space program has been reinvigorated with a new sense of purpose. In the VSE, the National Aeronautics and Space Administration (NASA) has been given a mandate to do the following:

- Complete the International Space Station (ISS) by 2010
- Retire the space shuttle by 2010
- Develop of a new vehicle to continue the United States' long-established human spaceflight program, and
- Return a human to the lunar surface by 2020.

From the passage of the NASA Authorization Act of 2005, which endorsed the VSE, with broad margins, to the recent approvals of budgets for NASA exceeding the president's requested increase, the solid bicameral and bipartisan support for this bold endeavor demonstrates the strong national interest in pursuing this ambitious set of goals. More recently, 17 senators and representatives requested that the White House convene a bipartisan, bicameral summit to address the United States' future in space and its challenges.

Such a summit would have been a critical opportunity to discuss the three leadership challenges that the United States faces if humankind is to break out of its 35-year-long, self-imposed confinement to low earth orbit. The United States must decide how it can maintain support for current projects in order to preserve our national credibility as a reliable and competent leader and partner in space exploration. Indeed, providing sufficient resources for the United States to continue to play a leadership role in both understanding our own planet while advancing the frontiers of humankind and establishing a human presence on the Moon.

Today, the U.S. civilian space program faces three critical challenges:

- Managing the gap between retirement of the space shuttle and the first flight of its replacement vehicle
- Planning for the future of the International Space Station and what NASA's role in the ISS will be, and
- Providing a key leadership role in understanding Earth through the deployment and support of the Global Earth Observation System of Systems (GEOSS).

The first challenge that must be addressed relates to our ability to place our astronauts in space and return them safely to Earth. The space shuttle is being kept in service until 2010 to complete the construction deadline for the ISS, as has been promised to our allies and partners. Failure to complete the ISS would be a severe blow to our credibility as a worthwhile partner in space exploration.

Keeping the shuttle flying, however, requires significant resources—resources that will be available to develop a replacement vehicle following the completion of the ISS and retirement of the Shuttle 2010. While NASA administrator Michael Griffin has previously stated that the replacement spacecraft and launch vehicle, the Orion and Ares I, respectively, could be flying as early as 2012, budgetary and programmatic difficulties may have already pushed the first flight of the Orion capsule back to 2015. If the Orion/Ares I doesn't receive sufficient support and doesn't fly until after 2015, the plan to land on the Moon's surface by 2020 will be jeopardized and with it U.S. leadership in returning

humans to the Moon. Some of these problems may be addressed by exploring other options, such as using the Orion capsule on an existing launch vehicle (either international or domestic) of roughly comparable payload capacity.

The second challenge that must be recognized and addressed is the retirement of the International Space Station. Right now, NASA has no specific plans for the ISS after 2015 and may opt to withdraw from the project in order to free up enough resources to complete development of the transportation infrastructure and the construction of elements of a lunar base needed to establish a permanent presence on the Moon. Furthermore, if NASA continues to use the ISS beyond 2015, there is a very real risk that, in the absence of the larger Ares V launch vehicle and a concrete plan for returning to the Moon, NASA will not complete the development of the Orion capsule necessary for trips to the Moon and back. In such a case, the United States will have sacrificed its key leadership role in human space exploration. Yet, abandoning the ISS altogether—a mere six years after its completion—would signal a cavalier disregard for the resources that the United States and its partners have invested in this infrastructure. This would risk damaging our credibility by showing us to be an unreliable partner in the most ambitious joint scientific and engineering feat of our time. It is important to note, however, that it isn't necessary that the United States withdraw from the ISS altogether—the essential requirement is that NASA not be forced to curtail plans to move forward simply to cover the operational costs of the ISS.

Finally, the third challenge relates to the collection of environmental data through earth observation satellites. Global concern with climate change makes the sacrifice of earth observation to support human space exploration a very unappealing option. Further, the United States has already committed to a bold leadership role with the July 2003 launch, by former secretary of state Colin Powell and current National Oceanic and Atmospheric Administration (NOAA) administrator VADM Conrad Lautenbacher (USN, ret.), of a worldwide effort to build the Global Earth Observation System of Systems. If we establish an organization to create a system like GEOS and then immediately fail to meet our agreed-on commitments, it will be very difficult indeed to generate future support for international projects, and as a consequence, our basic ability to lead in other space-related areas—especially returning to the Moon—will be greatly compromised.

Historically, the way that NASA has dealt with such competing priorities is through the senseless cannibalism of one project after another. This may not, however, currently be an option. On one hand, the broad, bipartisan support for a national vision of space exploration and the immediate interest should encourage solid, robust support for human space exploration; on the other hand, the growing concern of global climate change necessitates full support of earth observation. In these space leadership challenges, failure to provide near-term support will immediately erode our credibility, while in the longer term, our leadership role is at great risk.

In recent years, the number of tasks undertaken by our civilian space agencies has grown dramatically, yet budgets have not kept pace with these increased responsibilities. There are some ways to limit the unrestrained growth of space spending, such as through international cooperation or better coordination of other U.S. capabilities like NOAA's well-established operational earth observation capabilities. It is far more important, however, to provide balanced funding for both human space exploration and earth observation at the levels needed to fulfill the obligations we have undertaken. Simply shifting funds from one program to another not only creates program instability and delays but also is, in the end, simply a stopgap measure built around falling short on one promise for the sake of keeping another.

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