



INTERNATIONAL SPACE EXPLORATION UPDATE

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U.S. Leadership and Space Exploration



The Implementation of the Vision for Space Exploration

In his 2006 State of the Union address, President George W. Bush emphasized both the importance of U.S. leadership in bringing partners together around a common agenda and the importance of innovation in a competitive, globalized world. This is significant in light of President Bush's launch, two years ago, of a bold and noble Vision for Space Exploration (VSE).

The civil space program led by the National Aeronautics and Space Administration (NASA) has always been the country's standard bearer of both international leadership and innovation. However, NASA is not listed among the agencies designated to implement the new American Competitiveness Initiative (ACI). Only the National Science Foundation (NSF), the National Institute for Standards and Technology (NIST), and the Department of Energy (DOE) appear on that list. It is clear that NASA is no longer seen as a key source of innovation but is now purely an exploration agency.

Indeed, the initial focus on transportation to low earth orbit, when there are already a multitude of launchers available, as well as the associated design of the "shuttle derived" or "Apollo on steroids" crew exploration vehicle (CEV) is fully congruent with this perception.

Further, the implementation of the vision, as proposed by NASA, is perceived nationally and internationally as a national program echoing a Cold War mentality, with China now filling the role of the Soviet Union archrival.

U.S. Leadership in Space Exploration

The Vision for Space Exploration is an opportunity for the entire world. Such a bold and ambitious vision is unveiled only once in a generation. It would be a shame to waste such a rare opportunity due to shortsightedness. This vision will not become a reality without true U.S. leadership.

The future of international space exploration is at a turning point and so is U.S. leadership.

Space exploration has always been very complex. On the national front, one has been confronted with the political, diplomatic, budgetary, and technical swings and compromises that govern any national space program. Activities in space also lie in the middle of strategic and foreign policy considerations.

Since NASA has already had to sacrifice its image as a technology innovator to benefit exploration, it is understandable that it does not want to be further constrained by foreign policy requirements. However, exploration demands leadership, which in turn is dependent on foreign policy considerations.

One could argue, however, that exploration in a difficult budget environment would cannibalize both the International Space Station (ISS) and science programs, areas in which most of the collaborative efforts today are taking place, resulting in a critical loss of U.S. leadership. Therefore, the current mindset, articulated by the expressions "If we build it, they will follow" and "Forget diplomacy, let's go back to the moon," is closer to isolationism than to leadership. In other words, being first without having any followers is not leadership, it is merely being alone.

International and Multilateral Space Exploration

Multilateral Space

The environment for civil space is indeed more complex today than ever. Civil space activities have now reached “global status.” In the world of nuclear proliferation, initially only 5 nations, China, France, the UK, the United States, and the former USSR, had nuclear weapons and were able to discuss the topic behind closed doors. Now, there are more than 10 nations with the technology base needed to make and deliver nuclear warheads over thousands of miles. This new situation is completely different, and the nuclear proliferation is difficult to control. The situation is well-known and understood even if it is difficult to manage. The same situation has occurred in space technology, though this situation is much less well-known and understood—which is strange, as rocket technology is missile technology. The UN Office of Outer Space Affairs in Vienna has only been able to generate progress on the issue of space debris, and there is still no international council to discuss other space issues. The lack of international cooperation on critical issues arises largely from the view shared by many states of space as a strategic high ground. As such, countries are reluctant to engage with each other, fearing that their respective asymmetric advantages in space exploration might be eliminated or exploited. Whereas, in the 1950s and the 1960s, there were 2 main actors in space, there are currently 6 nations with full space capabilities and many more, such as Israel, Ukraine, Brazil, Pakistan, and Korea, with partial capabilities.

U.S. Civil Space

The United States, of course, remains the dominant player if only in terms of its budget allocated to space, in general, and to civil space, in particular. Further, the United States has a clear mandate to implement the presidential Vision for Space Exploration. Whether or not the United States will be able to attract and lead other nations to return to the moon remains uncertain and is the real question of leadership.

What is certain is that the implementation of the Vision for Space Exploration is generating difficulties nationally and internationally.

The Western Allies

There is the issue of the old allies, Europe and Japan. The traditional relationship between the Western partners of the ISS has changed. The transatlantic relationship for example, although recovering fast in light of the Iran crisis, is still perceived as weak. Further, in matters of space exploration, it has never been weaker. The trade limitations associated with International Traffic in Arms Regulations (ITAR) and the uncertainty surrounding the future of the space shuttle and its impact on the ISS have been eroding U.S. leadership in civil space. The recent cuts in the science programs meant to fund the vision, appearing in the FY 2007 budget, are amplifying the trend.

It is essential to note that many things have been learned from the ISS. The main lesson is that no one can rely anymore on a single national space transportation vehicle, even less so when this vehicle exists only on paper.

The BRIC

There are also the three nations with full space capabilities out of the famous four BRIC nations (Brazil, Russia, India, and China) to contend with. For many economic and political reasons, it is indeed attractive for all to cooperate with these countries.

Russia, currently surfing on high energy costs and its oil export market, is revitalizing its space assets and is by far the most operationally active spacefaring nation.

Then there are India and China. India, for the first time, is developing a robotic probe dedicated to something other than applications on earth. This robotic probe is a moon orbiter called Chandrayan. China successfully completed its second spaceflight with Shenzhou 6 last October. According to NASA, this capsule, compatible with a lunar mission, provides China with a six-year lead on the U.S. CEV.

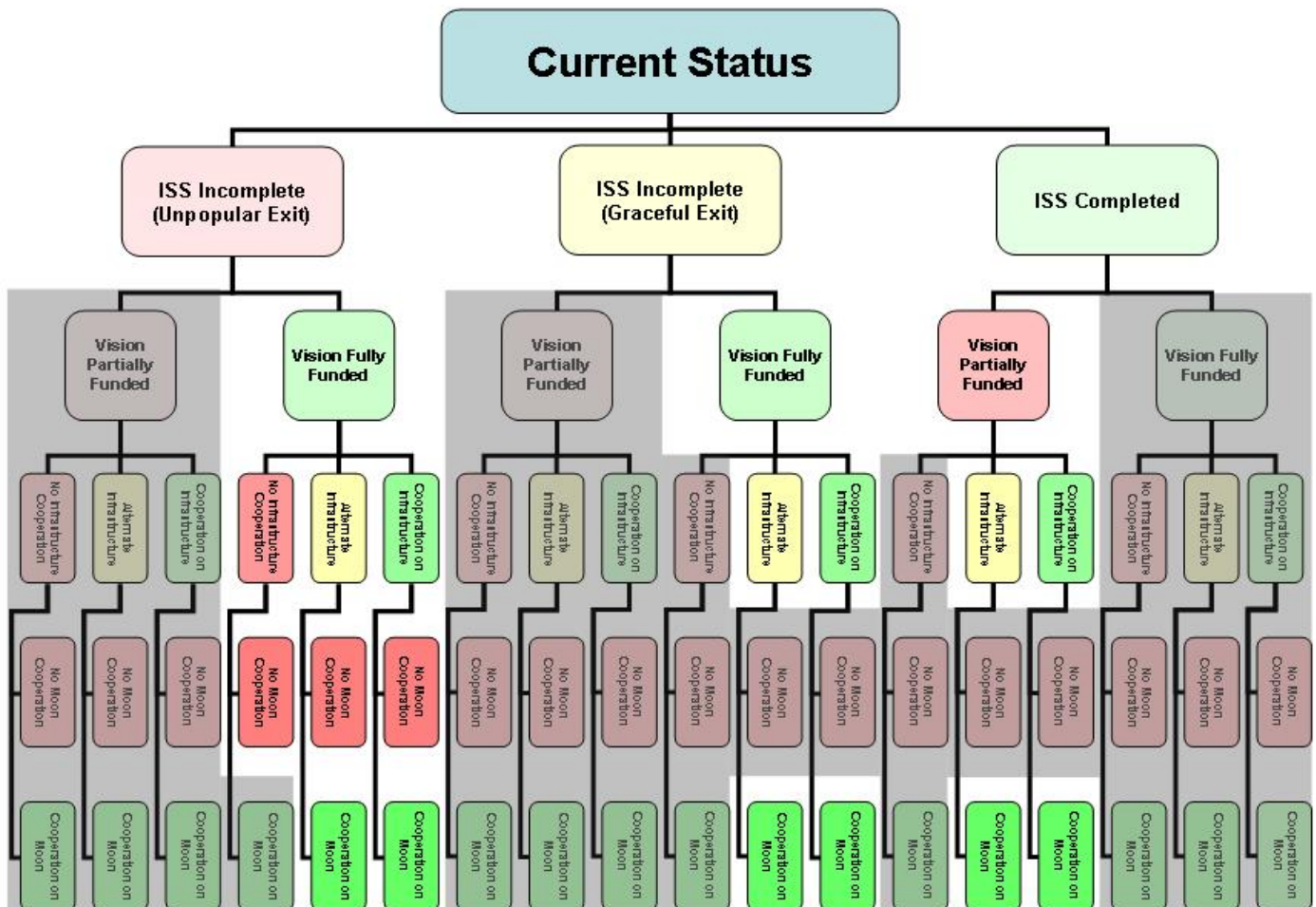
While civil space was undergoing a dramatic change from a polarized to a global environment, new cooperation axes and models surfaced, both between BRIC nations and between BRIC and the rest of the world. Disorder and absent global leadership increase with the number of players.

Scenario Analysis

The following graph depicts the future of international space exploration based on scenario analysis. It identifies scenarios that best support global long-term space exploration. These successful scenarios enable cooperation on the moon.

Four different cases were selected to produce the different scenarios. Each scenario provides a typology of cooperation for space exploration as well as an indication of resultant U.S. leadership (cooperation on the moon). The four cases are as follows.

1. The United States is able to meet its international commitments to the ISS.
2. If it does not, the United States is able to demonstrate and retain its leadership in human space exploration (HSE) and finds a political win-win solution with its partners. (This supposes that the dialogue goes beyond the traditional exchanges between the space agencies.)
3. The United States is able to fund the exploration program—its return to the moon—as needed.
4. The United States is able to attract resources from its partners to build the infrastructure or backup infrastructure needed to reach the moon.



Conclusion

Of the many scenario combinations, only six allow international space exploration under U.S. leadership to continue beyond the ISS.

From a budgetary standpoint, it is impossible to fully fund both a completed ISS and a new transportation system to the moon. As such, two scenarios allow space exploration to develop to the moon:

- Develop an international space transportation infrastructure that would provide interdependency.
- Delay the VSE, convince the partners to participate in developing a scheme of systems to reach the moon, and create an alternative transportation system that provides autonomy and redundancy.

From a diplomatic standpoint, it is easy to understand that if the ISS is not completed despite the best of U.S. efforts, and if the partners feel cheated, U.S. leadership will be greatly compromised, even if the vision is fully funded by then.

Finally, the most likely scenario to occur is that the ISS will not be completed but the United States will be able to negotiate a win-win exit strategy with its partners. This strategy would probably include cooperation on the transportation systems scheme to reach the moon. This scenario, however, demands U.S. leadership at the highest level. Indeed, former president Ronald Reagan himself sold the ISS idea to the G-8 members in the 1980s. The latter strategy would also serve the diplomatic goal of strengthening current alliances with Japan and Europe. This will take some time. In the meantime, in order to leave this vital option open, it is essential for the United States to encourage industry-to-industry cooperation for providing best-value solutions.

Another option for the United States is to forge additional partnerships in space with India and China. Efforts are underway with India but should not be overstated. The United States could allow the Chinese to dock at the ISS, showing the current partners that the ISS is passé and that if they do not want to get left behind with a relatively pedestrian project, they had better get on board with a return to the moon. Then the ISS would again serve its original goal of leadership and foreign policy and could allow space exploration to go on.

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