

THE CAPABILITY CRITERION: INTERNATIONAL COOPERATION AND NATIONAL PRIORITIES IN SPACE DEVELOPMENT

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Introduction

The choices between international cooperation and competition, and finding the right balance between the two, has been a major concern of space diplomats and leaders in Asia, Europe, and North America for much of the last few decades. Debate in policy circles has revolved around

questions of cooperation, and whether collective assurance or independence is the best course of action.

For many decades there has also been an air of utopianism in the space enthusiast community which suggests that by moving into space, humanity could eliminate poverty, unlock the secrets of creation, and make everyone free, wealthy, happy, and wise, and in many ways space development does indeed have the potential to increase wealth and also lead to major advances in physics, biology, philosophy, and other fields. But regardless of the great perceived potential of space activity to mitigate many human ills, the same utopian view of humanity's potential in space also brings baggage that may cause space enthusiasts to unwittingly hamper the activities that may bring the very benefits they most desire.

Calls for international cooperation in space are far more prevalent than similar calls for international cooperation in the air, on land, or sea. International cooperation is complicated, expensive, and inefficient in terms of leadership roles and expectations. Globalist-minded space enthusiasts still advocate the idea that global space cooperation offers the best way to heal many of the material and moral problems of today, and a planet working together is the ideal way to accomplish a prosperous future for everyone. David Lasser, the first president of the American Interplanetary Society, summed up this worldview well in his annual report, April 13, 1931:

I anticipate, naturally, that in dealing with a question such as the rocket which may be a weapon in future warfare, that full cooperation [among nations] will not be possible, but a beginning can be made. Such international cooperation should be begun and pursued energetically, for it seems to me that the solution of the interplanetary problem is too large to be localized in any group or nation. I can foresee the building of the first space ship only as a joint effort of a united Earth.¹

Although Lasser's "first space ship" was envisioned as a complicated manned voyage to the moon, neither the launch of humanity's first satellite, Sputnik I on October 4, 1957, nor Apollo 11's first manned lunar landing on July 20, 1969 was in fact a joint effort of a united Earth. Though Lasser erred in his prediction, the globalist fervor remains.

¹ "Annual Report to the American Interplanetary Society, April 13, 1931" reprinted in David Lasser *The Conquest of Space* (1931), Apogee Books reprint 2002. Burlington, Ontario, Canada. Pp 181.

Donald Cox and Michael Stoiko argued for international controls of space missiles in their 1958 book *Spacepower: What it Means to You* with the Cold War in full swing, going so far as to recommend a United Nations Space Force to manage human space efforts. Arguing from many perspectives, they claimed potentially, a foolproof mutual international setup for the control of long-range missiles and the satellites, which have both military and peaceful uses, will do more toward ensuring the survival of civilization as we know it than any single act.²

Almost thirty years after Lasser argued that it would take the resources of a united Earth to solve the interplanetary problem, Cox and Stoiko continued the economic argument for international cooperation in a different way:

The tremendous cost of the present missile program in terms of natural resources and manpower have forced the United States into a top-level national control over production and future employment of long-range missiles. The Deputy Assistant Secretary of Defense... was given additional responsibilities in October 1957... by the Defense Secretary and the President to oversee the entire Army, Navy, and Air Force missile program... This is the first time in the nation's history that so many complications have arisen over the control of a single weapon of war... Duplication of missile production efforts on an international level can be just as costly, in the long run, as on a national level...³

Eighty years after Lasser and fifty years after Cox and Stoiko, we are nowhere near a united Earth space program, and projects such as the International Space Station seem to offer evidence that international cooperation dramatically increases costs rather than provides savings.⁴

The recently drafted Global Exploration Strategy⁵ acknowledges the benefits of both national programs in organized and coordinated actions among spacefaring countries, and potential international cooperation. The document does not promote a united Earth space program, but one that acknowledges that international cooperation may or may not be the best option for all programs.

Thus the space agencies and space advocates are faced with a

² Donald Cox and Michael Stoiko. *Spacepower: What it Means to You*. John C. Winston Company. Philadelphia, Pennsylvania. 1958. p 161.

³ *Ibid*, p 163.

⁴ Jones, Tom, *Sky Walking: An Astronaut's Memoir*. HarperCollins, 2006.

⁵ Global Exploration Strategy of 2007. <http://www.globalspaceexploration.org/>

dilemma. Some advocates view international cooperation in space as a mostly unrestricted good and self evident requirement for space exploration and development, while others take a strictly nationalist viewpoint, and believe that their nation must go it alone.

So how should nations and commercial space entities address the dilemma? The answer must be to find a method to realistically examine the potential costs and benefits of international cooperation vs. national efforts or a combination of the two in space projects. This chapter argues for the “Capability Criterion,” a method for individual actors (state or private) to decide to engage in international cooperation on a particular project or not based on a logical framework.

What is the Capability Criterion?

The Capability Criterion is meant to be a benchmark or framework that any individual agent, whether organization, company, or nation, can decide whether or not they should engage in a particular international cooperation endeavor. The logic of the framework is that if the criterion is not met, the agent should presumably not cooperate. Conversely, if the criterion is met, then the engagement in the proposed cooperation makes sense.

The criterion is also a method by which the likely benefits of cooperation can be measured. It does not consider international cooperation in any form as a good in and of itself, but solely measures benefit to the individual state or commercial entity. In this way, the Capability Criterion can dismiss utopian globalist sentiment and cut to the heart of the matter: Is the proposed cooperation good for the individual nation or company that is considering cooperating? The criterion uses space capability as the measuring stick to determine whether cooperation benefits the individual entity. “Space capability” is defined here as the ability to do something (anything) in space, and “additional capability” is simply the ability to do something in space that one could not do before. The metric should be very easy to apply even in the proposal stage of any international cooperation project.

The Capability Criterion is this:

An actor should engage in international cooperation if and only if completion of the cooperative effort’s objective will result in the actor achieving a higher level of enhanced space capability than it would be able to achieve by acting alone while exerting a reasonable but strenuous level of political will and resources.

The Capability Criterion has three major elements

First, the sole measure of whether an agent should engage in cooperation is whether or not it will personally gain in space capability from the deal. If the agent can do more in space than it could prior to the cooperation, then it is worth pursuing. If the cooperation does not produce more space capability for the actor, it is not in its interest to participate, good feeling or unity of effort notwithstanding. Enhancing space capability, not goodwill, is everything.

The second element of the criterion is an essential modification of the first. It is readily apparent that if only the first part mattered, the Capability Criterion would be a blank check for any type of cooperation. Indeed, cooperative activity in space would result in more capability in space if comparison was made vis a vis no space activity at all. Therefore, the first concept must have a graded modification, in that when the agent compares its anticipated space capability after the completion of the cooperative effort, it does not compare it against lack of space activity at all, but rather against an independent hypothetical effort aimed at a similar objective.

By way of a non-space private sector example, a guiding principle of the Hilton Head Island Chamber of Commerce reads:

"Partner with organizations only in areas where we cannot accomplish the objective of the partnership with our own organization alone."⁶

This guiding principle identifies the fact that sometimes partnerships exist for their own sake, without any real, analyzed benefit to one or more partners, and that partnerships are, by their very nature, more complex organizations than their originators in terms of oversight and command structure. Partnerships simply lead to more difficult (and expensive) projects than independent projects. Knowing this, the Hilton Head Chamber does not partner unless the worthy objective cannot be met alone. The default setting of the organization is independent work.

To bring this concept in a space context, a guiding principle of the European Union Space Policy communication reads:

International cooperation should also serve as a market opener for the promotion of European technology and services in the space field and so help strengthen this strategic industrial sector [of Europe] ... The EU, in close collaboration with the

⁶ Hilton Head Island, South Carolina Chamber of Commerce "Guiding Principles" July 2011.

ESA, will continue to maintain and strengthen its “space dialogues” with its strategic partners – i.e. the United States and Russia – with a view to increasing cooperation. These dialogues seek to identify areas where there is mutual benefit in cooperation... [Authors’ emphasis]⁷

In both the local business sector and supranational organizations, partnerships are meant to be a tool to be used only when necessary, not a goal unto themselves.

The second element of the Capability Criterion sets the agent’s default position to independent work because it forces the agent to consider working towards the goal independently. If it can get more space capability in a independent effort (implicitly accomplishing the cooperative’s goal as well, since space capability must match or exceed in a independent effort or the agent would choose to cooperate per the Global Exploration Strategy), then no cooperative effort is needed because the agent can accomplish its goals without the increased costs in money and negotiation time related to cooperation.

The third element is perhaps the most subjective: the concept of an independent “reasonable but strenuous exertion.” There will be times when an individual agent will indeed be able to accomplish the same goals as a cooperative effort, but the cost in resources would be so great compared to the cooperative effort that it would be beneficial for the nation or company to cooperate.

A simple example of such a situation may be a partnership between two nations to launch a geosynchronous communications satellite, where one of the partners does not have a capable, indigenous rocket. The satellite-building nation may have the technical and economic capacity to build such a rocket to fit their needs, but the infrastructure and development costs in time and effort may simply be too great for the worth of the satellite. They may not even be able to launch heavy rockets due to geographic considerations. For the launching country, additional revenue generated from launch, or access to the satellite’s future capability in orbit, may be a beneficial tradeoff even if they could build a similar satellite themselves. Under the Capability Criterion, international cooperation is judged possible and desirable in such a circumstance.

⁷ Communication from the commission to the council, the European Parliament, the European Economic and Social Committee and the committee of the regions towards a space strategy for the European Union that benefits its citizens, 2011.

What exactly entails a reasonable but strenuous exertion is necessarily left to the decision makers. A detailed quantitative cost/benefit analysis may be required, but a back of the envelope qualitative consideration may work equally well in deciding exactly what reasonable means. What can a nation acting independently reasonably do? At best, this will be an arguable estimate. Regardless, the decision maker must offer a realistic independent alternative to cooperation.

The Capability Criterion is an expression of mutual advantage, based on the premise that no agreement will be made without both parties gaining benefit, with the additional and important point that that cooperation in and of itself does not offer substantial advantage. An actor must benefit by advancing its own space capability (which can be exercised independently), and should not simply use “feel good” internationalism as a legitimate reason for cooperative action.

The best way to explore the Capability Criterion is to apply it to some problems vexing the space community today. Next, we will discuss some problems and apply the criterion to see more clearly whether the criterion helps us gain more understanding of the underlying situation.

Collective Assurance and National Space Policies

In 2011, after the fanfare and applause by many for the new US Space Policy and National Security Space Strategy, the European Union released its long awaited space policy. Despite numerous articles, commentaries, and international discussions about the merits and failings of American space policy statements released in 2006 and 2010, there was very little commentary on the EU’s new statement.

The EU space policy is based on years of meetings within the European Commission and its space council regarding the direction for Europe in space. The policy articulates goals and objectives within three main areas: strategic interests, security, and economic prosperity. Throughout the document, strategic language is interwoven with Euro-centric goals and objectives for its industry, economy, civil, and military arenas. The policy indicates that Europeans understand well the political and economic importance of space power as a vital interest, its impact on the everyday life of European citizens, and its affect on Europe’s quest for greater security, prestige, and wealth. Interestingly, the order and precedence of the strategic objectives were like a national-focused document with end states reflecting the interests of Europe first, but lacking

the global flavor of the 2010 US space policy and follow-on strategy.

The strategic goals of this document are not what many might expect, which would include a US-modeled push for “interdependence,” “collective self-defense,” and further integration in the “global economy.” Rather, the EU produced a highly unilateral document focused on the advancement of European domestic space capabilities. These capabilities aim to enable “economic and political independence” for European citizens, and a greater role for European excellence in space and worldwide. It views space as an area of strategic importance and acknowledges the need for enhanced military capabilities in space, in order to “strengthen its security missions.”

The Galileo satellite navigation system is one example among many projects where the European desire is to remain independent. Instead of relying on the United States’ Global Positioning System (which even the United States considers a global utility), Europe is duplicating a global navigation system in order to secure their independence from overreliance on US space assets.

Another key topic to note is that “independent access” to space is underscored by the statement that Europe will not rely on any foreign launch or service provider. This is interesting when comparing the EU with current US plans and policy that project reliance on Russian Soyuz for human access to the International Space Station, and American reliance on commercial and foreign partners overall. The US reliance on non-US partners could lead to advantages for foreign commercial entities and hurt the US in terms of the space industry and high tech jobs, an area that suggests a potential strategic contradiction within US policy, one that bears further scrutiny.

Europe’s vision for space power advancement includes growth for its domestic space industry and economic capabilities as well. The EU policy states, “a solid technological base [is required] if [Europe] is to have an independent, competitive space industry.” To advance the influence of the EU space industrial base globally, innovation must build on innovation, and like US space policy that advocates increased innovation in research and development, the EU policy also advocates innovation, but with a different tone.

To promote “industrial competitiveness” in the marketing of European space technology, it suggests “setting ambitious space objectives” as the key to “stimulating innovation,” but contrary to the US approach, it does not call for unlimited funding of STEM (Science, Technology, Engineering, and Math) education initiatives to keep youth

excited. The European approach recognizes that beyond mere research and development, their space industrial base will neither innovate nor compete on the world stage without concrete commitment to funded and ambitious objectives in space-related exploration and national security programs. As a result, Europeans desire a strong industry that will provide enhanced prestige and influence necessary for European space efforts to be advanced in multilateral forums.

Our third observation concerns the EU's view of international cooperation. Reading through the document, and reviewing the scant press coverage that was given upon the release of the policy revealed a structure quite dissimilar from US policy. Rather than interweaving international and global themes throughout each sector or mission area, the document focuses on advancing domestic capability and policy for the benefit of Europeans. While Europeans are not anti-international cooperation, they do view themselves as a partner and want to maintain "space dialogues" with their "strategic partners," notably Russia and the United States. The section on international cooperation is rather short, and the overall strategic goal is to use space "as an instrument serving the Union's internal and external policies." The document does, however, acknowledge that space efforts are increasingly not just for individual nations, but in many cases can be achieved through pooling resources.

In contrast, US space policy states that international cooperation in US space programs is a requirement, and it is a directive for all departments to pursue international partnerships in all space mission areas, an entirely different approach than the one proposed by the Capability Criterion framework. The EU, alternatively, appears to see it as something to be considered following the development of domestic capabilities and leadership in critical areas such as positioning, navigation and timing, and space launch, among others. The Europeans intend to maximize their space capability unilaterally in accordance with the Capability Criterion, and want to partner only when it will benefit them.

Among the bolder international efforts is an interest in opening up dialogue with China, and utilizing EU space power to expand European influence in Africa.

In summary, EU space policy is a policy about Europe, its goals and objectives for the Union to gain in space leadership worldwide. Gaining added security, prestige, and wealth in space allows Europe to achieve a "key position" in space power, based on excellence and "increased European capability," a policy directly compatible with the Capability Criterion.

Similarly, many experienced American space professionals, with knowledge of international space cooperation and policy, understand the importance of shaping the strategic space environment to benefit US vital interests, and many wish to get past the perceived international angst that followed the release of the 2006 space policy (see Joan Johnson-Freese's *Heavenly Ambitions: America's Quest to Dominate Space* for a representative example), while maintaining good rapport with our allies.

In our view, a new US national space policy should follow the European lead and apply the Capability Criterion, emphasizing goals and objectives for the development of American leadership through increased capability, ambitious space objectives, innovation, and global competitiveness of the American space industrial base. International cooperation, as the Europeans note, should be best articulated in appropriate bilateral and multilateral agreements, but not in a national space policy. The 2010 US national space policy contains many good points, but it reads more like an international statement of principles than a national strategic document.

Rather than using language such as “collective assurance,” “collective self-defense,” and “interdependence,” and emphasizing a policy of reliance of foreign space capabilities, Europe is pursuing a course of independence and increased European capability to achieve excellence and increased status for the advancement of European space efforts.

As the US current space policy notes, every nation has the right to access and use space. Each nation has the right to develop its own nationally-focused “unilateral” space policies that serve to advance its vital interests in security, prestige, and wealth as the baseline for any international cooperation it chooses to support. Failure to invest in bold, ambitious space efforts with a national tone (in all sectors) in space will not only hurt the US space industry, but will harm its ability to advance its global interests in space, impact its traditional vital interests of independence and achievement, and threaten the very preeminence that America has labored so hard to achieve over the past fifty years.

If the goal of the US is the advancement of global space exploration, then the US needs to observe that other nations and partnerships such as the EU and Russia are taking an alternate path toward increased domestic space capabilities and expanded infrastructure for national interests. The EU is in fact pressing ahead with its goals, and stepped into the leadership vacuum that the US has created as a result of the shutdown of US programs, abandoning US capabilities, and allowing the loss of large numbers of skilled space workers.

In our view, future American space policy and strategy should address international efforts for mutual benefit, but should also focus on advancing American capability to enable a long range strategy for exploration and enhanced military capabilities in space, just as the Europeans are pursuing, and just as the Capability Criterion suggests each nation's space program should.

National Space Export Controls

For the first time in more than a decade, the US is considering modifying and updating the International Traffic in Arms Regulations (ITAR), a critical set of rules and regulations pertaining to technology exports. The space community, academia, and both the executive and legislative branches of the US federal government are discussing how to improve America's space export control system while maintaining a robust national security and civil space enterprise.

There are three major viewpoints to consider.

First, ITAR itself "poses a potential national security risk," as noted in the latest Quadrennial Defense Review (QDR), due to its complexity, its protection of "everything," and its hindrance to international cooperation and industrial competition.

A second view held by many members of Congress, and dates back to 1999 or earlier, when the current space export control framework was devised and passed in the Strom Thurmond National Defense Authorization Act. It calls for protecting everything that is space and missile related, regardless of its size, commonality, and availability in the global market. All parts and components are to be controlled within the United States Munitions List (USML) as weapons, and not as commodities on the Commerce Control List (CCL).

Third is a thought process advocated by many aerospace and industrial advocacy groups, which promotes moving all commercial communications satellites and their widely available components from the USML to the CCL enabling them to be sold openly. This would give the US space industrial base the added boost it needs to compete in the global space market, and reduce the attractiveness of the "ITAR-free" movement in India, Europe, and China.

Suppose that these three main viewpoints on ITAR are the only relevant viewpoints. Which, then, would be the best way forward, and how

can the Capability Criterion help make the determination, as ITAR is nothing if not an issue of international cooperation?

Let's begin with the first. According to the 2010 QDR public report, the current export control system, and not just the part that applies to the space industry, is considered a "national security risk." Previously the concern was that the application of ITAR, with its burdensome restrictions and protections, was causing national security risks because the US space industry was losing revenue and market share, and thus jeopardized its ability to also meet the needs of the US Defense Department over the long term. Now the view suggests that the real problem lies in the system itself, which relies on Cold War-era protection methods, and assumes an economic environment based on Cold War dynamics. This view holds that the current global economic system, which largely shapes relations among states due to the structure of global trade, makes the US current export control system obsolete, and since it is obsolete it results in additional risk to US national security because it diminishes economic security and prosperity.

In addition, it views the risk to security based upon a perceived lack of real engagement in the global commons of space and the utilization of this commons for the benefit of all humanity.

In other words, due to the increasing globalization of the space industry, the United States should maintain its "lead" rather than "preeminence" through increasing participation in the global economy, rather than by protecting its industrial base and ability to produce space capabilities needed to stay ahead of its competitors. In this view, American space power is not just space power; it's space as a foreign policy and strategy tool.

The President addressed this view when speaking on his administration's review of export controls at the 2010 annual conference of the Export-Import Bank and its connection with his National Export Initiative. He stated that changes are needed "for our strategic and high tech industries, which will strengthen our national security," and recently added that his Administration would even consider executing this plan without Congressional approval.⁸

By contrast, the second view that seeks to protect "everything" and requires a rigid licensing and monitoring framework to protect the release of anything space related. This view came about after the Loral satellite incident involving China in the late 1990s, when Loral engineers allegedly

⁸ <http://thehill.com/business-a-lobbying/173425-white-house-export-reform-doesnt-require-congress-to-be-enacted>

shared sensitive US rocket and guidance technology to correct deficiencies in the Chinese Long March launch vehicles that Loral was using to launch its satellites in violation of US export regulations. Many politicians expressed concerns that Loral had harmed US national security by sharing technology that could also be used to improve Chinese ballistic missiles, and the uproar in Congress resulted in the so-called Cox Commission.

The Cox Commission and Congress found errors and lapses regarding the control of US technology transfers concerning missiles, and as a result Congress expanded USML, but unfortunately by using vague and broad language:

...all satellites and related items that are on the Commerce Control List of dual use items in the Export Administration Regulations... on the date of the enactment of this Act shall be transferred to the United States Munitions List and controlled under section 38 of the Arms Export Control Act. [Emphasis added]

It's clear from the language – “satellite and related items” – that the provision now encompasses sensitive space technology as well as commodities like Kapton tape that is easily found on the global space market and widely used in non-military vehicles as well as military spacecraft. The problem, of course, is that while well intentioned, it creates a new problem for American companies, new competitors who step in to fill the void that US suppliers can no longer fill. Whereas before the United States was the leader in the space market for manufacturing commercial spacecraft, now Indian, Chinese, and European firms are profiting. Other nations now rely much less on US spacecraft, launch vehicles, and other components, leading to further shrinkage in the US space industrial base as well as the lower tier supplier base.

Research has shown that it is not so much the ITAR protections themselves that have hurt American firms, but rather the burdensome processes, procedures, and regulatory frameworks (please see the Aerospace Industry Association's *Competing for Space*, January 2012). Further, money that could be better spent in research, development, and other technology-advancing endeavors is wasted by paying for lawyers and other experts to wade through the bureaucratic red tape to acquire the necessary licenses.

And since the ITAR-free suppliers don't have the increased costs involving protection and mission assurance that American products have, their prices are lower, potentially attracting customers that once would only think of the US space industry to go to Europe to build their satellites, and

China to launch them.

The third idea, which lies at the halfway point between the first two, allows for some items to be moved from the USML to the CCL, which is controlled by the Commerce Department instead of the State Department. Commercial communications satellites are considered by many people to be “safe” to transfer to the CCL, allowing for common components across the space community to be sold around the world. Some critical technologies would still be protected under the USML, while common components would fall under a more permissive system. The goal of this approach is of course to enable US firms to regain lost ground in the space marketplace, and it’s currently being explored by a group tasked by Congress in the 2010 National Defense Authorization Act, Section 1248. This congressionally-directed action is tasked to the State Department (which controls the USML) and the Department of Defense, to evaluate the national security risks of removing all space components from the USML.

So what is the best approach for the United States to take to fix the problems caused by ITAR?

The Capability Criterion approach suggests that despite a push for globalization and the trend of national strategy to embrace globalization and the global economic system in trade, the primary responsibility of the US space program and of the export control regime is to protect American sovereignty and provide for the common defense, as stated in the Constitution. In order to do this, America must maintain not just an edge over our peer and near-peer competitors on the world stage but also preeminence and preferably clear leadership in the areas of space.

As one historian noted, John F. Kennedy understood that in order to maintain a leadership position on Earth, a nation must maintain leadership in space, the ultimate “high ground.”

To sustain its position as a leading space power, the United States should protect what is proprietary, while also allowing its industry to compete.

Without a strong industrial base that is fully integrated into the planning and strategy-crafting processes of the national security space enterprise, the capacity of US industry to develop high-quality spacecraft and launch vehicles needed to maintain space leadership will decline, and with it, its status as a superpower. While the authors feel the third option is the best overall, the government will necessarily undertake a robust national security risk assessment to determine its effects on US economic leverage and influence.

Do the US need a new export control system? We believe not.

Does ITAR need reform and streamlining? Definitely. ITAR processes need to be reformed to allow US companies, both large and small, to be competitive on the global market without draining their resources in a bureaucratic swamp. And here, the concept of the Capability Criterion can be of use. Adjusting ITAR restrictions to optimize American space capability will mean a balance between overzealous restriction (which can atrophy American space capability) and laissez faire freedom (which can improve others' space capability at the expense of the US while achieving no improvement in American capability). The Capability Criterion can help us make the correct decision.

Leadership through Capability

In a recent article in *The Space Review*,⁹ Lou Friedman asserted that, "American leadership is a phrase we hear bandied about a lot in political circles in the United States, as well as in many space policy discussions." He goes on to note that American leadership, "has many different meanings, most derived from cultural or political biases, some of them contradictory." This is true; many nations, organizations, and individuals worldwide, have different preferences, and different views as to what American leadership in space is, and what it should be.

We disagree, however, with Mr. Friedman's assertion that space is "often" overlooked in "foreign relations and geopolitical strategies." Our view is that while space is indeed overlooked in national grand geopolitical strategies by many in national leadership, space is used as a tool for foreign policy and relations more often than not. In fact, the US space program has become less of an effort for the advancement of US space capability and exploration, and is used more as a foreign policy tool to influence the strategic environment toward what President Obama referred to in his National Security Strategy as "The World We Seek."

But should the US shape its future in space using the international collaboration piece as the starting point? We suggest that the goal of the United States should be leadership through space capabilities in all sectors.

America achieved leadership in space because it demonstrated technological skill through the Apollo lunar landings, deep space exploration probes, and exploration of the outer planets. It did not become recognized leaders in astronautics and space technology because it decided to fund billions into research programs in the absence of clearly defined

⁹ <http://www.thespacereview.com/article/1778/1>

national objectives.

The US has allowed itself to drift from a traditional strategic definition of leadership in space exploration, as indicated by the decision to shut down the space shuttle program without a viable replacement system, while paying millions to use Russian systems to ferry astronauts and cargo to the International Space Station.

Each nation should have freedom of access to space for the purpose of advancing its “security, prestige and wealth” through exploration and technological achievement.

Maintaining leadership in the space environment is a worthy goal, and space superiority does not require orbital weapons, or preventing other nations from access to space, nor does it preclude international cooperation. Rather, it indicates a desire to achieve goals for national security, prestige, and economic prosperity. The quest for excellence in space is just one part of international space competition that is positive and healthy.

If America wants to retain its leadership in space, it must approach its space programs as the advancement of its national security, prestige and wealth by maintaining its edge in space capabilities and using those talents to influence the international space arena.

Conclusion

The case for using the Capability Criterion to assess proposals for cooperative action in space is hopefully now clear. We believe that the Capability Criterion in action will maximize space development for human civilization because it optimizes space development decisions based on competition and strategy rather than merely on our hopes for the future. Further, if humanity were ever to face a rogue asteroid or another threat from space, the Capability Criterion in action would have yielded the most developed capabilities, enabling all spacefaring nations and indeed all of humanity to have the most advanced space capabilities possible to protect Earth.

Looking at the national and international policy and strategy documents concerning international cooperation in spaceflight, one will see that national sovereignty and interest is not dead, but is alive and well. The Global Exploration Strategy mentioned above speaks of the open nature of agreements in spaceflight, in which nations may come and go as they please. Europeans have expressed interest in participating in deep space exploration with NASA, but also have independent European ambitions;

the Russians and Chinese are the same.

Quality in international partnerships is created through trust and mutual national interests based on the Capability Criterion. While international cooperation is a good thing in space, as the Global Exploration Strategy and Roadmap agrees, national space programs should engage in independent actions when and where they desire advancement of indigenous space capabilities and interests. Space, as mentioned in the 2010 United States National Space Policy is for the use of all nations, but friendly competition among nations and the private sector also fuels the technology enhancements that enable progress, as well as the enhanced prestige and space power capabilities space enthusiasts desire. Utopian notions based on symbols of unity and international cooperation in the absence of strategic goals are a waste of time, and should not be pursued, while spacefaring nations continue the work of real-world space exploration development utilizing the Capability Criterion as the decision criterion.

The Capability Criterion should offer international appeal given the strategic importance of independence and healthy competition. It not only encourages national space capabilities, but also maximizes the overall human space effort by focusing on space development. Perhaps we will reach the goals dreamers have about space, but in order to do that we do not need utopian assumptions, but instead a focus on strategic assessments and cooperative frameworks in real-world documents such as the Global Exploration Strategy and Roadmap. Applying the Capability Criterion to US international cooperation decisions is a first step in ensuring our next steps into space contribute to the best possible outcomes for each nation and for humanity as a whole.

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The views expressed in this chapter are solely those of the authors and should in no way be construed as the official policy of the United States Government, the US Department of Defense, or the United States Air Force.

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Captain Brent D. Ziarnick



Captain Brent D. Ziarnick, US Air Force Reserve, is the Senior Space Duty Officer of the 701st Combat Operations Squadron, the reserve manning unit for the 607th Air Operations Center, Osan Air Base, Republic of Korea. During contingency operations, Captain Ziarnick serves as the Air Force Chief of Combat Operations' senior space command and control representative for the Korean Theater of Operations. Prior to this position, Captain Ziarnick served as a deployed space control officer in the Middle East supporting Operations Enduring Freedom and Iraqi Freedom. On active duty, he was Global Positioning System (GPS) satellite operator, engineer, and tactician.

Captain Ziarnick has been published extensively on space issues in both military and civilian journals, winning multiple awards for his articles.

In civilian life, Captain Ziarnick has served as an engineer and launch planner for Spaceport America in New Mexico, the world's first purpose-built commercial spaceport.

Captain Ziarnick holds a bachelor's degree from the US Air Force Academy in Space Operations, a master's degree in Space Systems Engineering from the University of Colorado - Colorado Springs, and a doctorate in Economic Development from New Mexico State University.

