



**SUSTAINABILITY AND THE NATIONAL SECURITY SPACE STRATEGY:
AN APPROACH TO THE CONGESTED ENVIRONMENT**

**ADDRESS TO THE INTERNATIONAL SYMPOSIUM ON SUSTAINABLE
SPACE DEVELOPMENT AND UTILIZATION FOR HUMANKIND**

March 1, 2012

**James Finch
Director, Space Policy and Strategy Development
Office of the Under Secretary of Defense for Policy**



“In less than a generation, space has fundamentally and irrevocably changed.” So wrote former Deputy Secretary of Defense Bill Lynn, in a recent issue of the Washington Quarterly.

Space is increasingly a shared domain in which we operate with more and more space-faring countries – both close allies and potential adversaries. Space is increasingly congested with increasing amounts of space debris; contested by a growing range of foreign counterspace capabilities; and competitive as more and more countries and companies operate in space. Each of these characteristics of the space environment poses new challenges for U.S. security and for Japan’s security as well.

In response to these challenges, then-Secretary Gates approved a new National Security Space Strategy last year. Responding to Congressional questions during his confirmation, Secretary Panetta stated his intention to continue the strategy’s implementation.

The National Security Space Strategy is significant in that it signals that – just as the space environment has changed –the way we advance our national security through space must also change.

The new strategy establishes three broad objectives, which have been noted by previous speakers. One is obvious and enduring: to maintain and enhance the strategic advantages that we derive from space. The other two are newer but equally important: to strengthen safety, stability, and security in space; and to energize our industrial base.

In short, in addition to protecting the advantages we derive from space, we must also protect the domain itself and the industry that provides our capabilities. Once, we could take the space domain for granted. We cannot any more.

Today, I would like to share with you an emerging strategy that we are discussing within the Department of Defense and with our interagency colleagues in the United States. This is a strategy to address the congested space environment, and we need your help. We need your feedback, your ideas, and your partnership. Sustaining the space domain is a global problem, requiring a global solution.

Debris Environment

Let me begin with the National Security Space Strategy – congestion is one of the key factors driving our overarching approach. As the strategy notes, there are about 1,100



active satellites in orbit, but the remainder of the approximately 22,000 items that we currently track are debris. The National Security Space Strategy builds on the President's National Space Policy, which cites debris as a critical challenge. In fact, it is significant to note that the National Space Policy, for the first time ever, identifies the sustainability of the space domain as a "vital national interest" of the United States.

The space domain is at risk however. As Secretary of State Clinton noted just last month, "the long-term sustainability of our space environment is at serious risk from space debris and irresponsible actors." While China's 2007 test of an anti-satellite weapon was the epitome of irresponsible action, the long-term and continuing threat posed by the debris it generated is a grave and enduring risk.

This esteemed audience does not require me to expound upon the threat of space debris to the long-term sustainability of space. The threat is real, and a recent study that we have just completed within the Department of Defense confirms the findings of NASA, the Inter-Agency Space Debris Coordination Committee (IADC), and several others: the population of space debris is continuing to grow. In fact, if we ceased all launches tomorrow, the amount of space debris would continue a steady increase for more than a century as pieces of debris collide with each other, producing even more debris, that collide with each other, and so on.

And that is the optimistic view!

The world is not about to stop all launches. Space-based capabilities are too vital. They are vital to our global security, to our global prosperity, and to our global inter-connectedness. With our continued use of space, the debris population will continue to grow. So, if we seek to maintain access to the space domain, both for ourselves and for future generations, we must take seriously the threat posed by space debris. And taking this threat seriously means that we must act differently.

Emerging Strategy

Within the United States, the Department of Defense has partnered closely with NASA to address the issue of space debris. Our close collaboration continues, and we have had several discussions and workshops addressing various aspects of this very challenging problem. Our work with NASA and the international community has slowly begun to converge into an overarching approach to address the "congested" space environment.

The goal of our emerging strategy is to stabilize the population of space debris. I will assert that stabilizing the population of space debris should be our common goal. Ten years from now, we will look back on our decisions today and wish we had been focused on this challenge. We need to make our actions count. I believe it is essential to set our



eyes on this goal so that we can measure our progress and can evaluate the effectiveness of various approaches.

Our emerging strategy is composed of three central pillars:

- As the first pillar, we must limit the further pollution of the space environment.
- Second, we must limit objects from colliding with each other and/or exploding.
And,
- Third, we need to actively remove high risk space debris.

This is simple, and you may be unimpressed. But I would note that this does involve some rocket science!

Even if you think our approach is simple, simple should not be confused with being easy. I'd like to spend the remainder of my time adding some texture and nuance to these three pillars to give you a sense of the difficult decisions and trade-offs required to stabilize the debris population.

Prevent Further Pollution

First, we must prevent the creation of new debris. One of the National Space Policy's goals is to strengthen the stability in space by strengthening measures to mitigate orbital debris. The National Security Space Strategy notes our desire to establish pragmatic guidelines for safe activity in space to avoid the creation of new debris. While the United States and the international community have made great strides developing debris mitigation standards, that is just the beginning. We must continually review, refine, and strengthen those standards, taking advantage of our evolving understanding of the environment. The Department of Defense is continuing to work with NASA and with international organizations – such as the United Nations and the Inter-Agency Space Debris Coordination Committee (IADC) – to ensure mitigation guidelines are strengthened appropriately to prevent further pollution.

In addition, we must collectively improve our compliance with those guidelines, creating incentives for compliance rather than exceptions or waivers to the guidelines. This will require tough decisions. The clearest trade-off is between near-term profits associated with extended mission lifetimes and the long-term sustainability of the domain that requires proper disposal of spacecraft at their end of life. We must ensure that new launch vehicles and spacecraft are designed, operated, and disposed of to minimize the creation of debris.

These are difficult, and sometimes costly, decisions. And to this point, we have often been short-sighted in making these kinds of trade-offs. We must do better. With a view



of the future, an understanding of the shared domain, and a spirit of international cooperation, these costs can be seen as they really are: as costs that are too important not to pay. And I should note that waiting to act will only increase these costs in the future.

Limit Collisions

The second pillar to stabilize the population of space debris is to limit collisions among existing objects in orbit. As was demonstrated by the collision of Iridium 33 and COSMOS 2251 in 2009, a catastrophic collision in space can turn two space objects into thousands of space objects. As bad as this is when it occurs accidentally, when this is done intentionally, it is the height of irresponsibility.

In addition preventing further pollution, we must improve our space situational awareness (SSA). We are committed to improving our SSA both by improvements to our systems and by increased cooperation with partners, allies, and the commercial sector, and you've heard previous speakers describe some of these improvements already. Space surveillance for debris monitoring and awareness is one of the areas specifically identified by President Obama in his National Space Policy as an area ripe for international cooperation. Today, the U.S. Joint Space Operations Center provides various levels of SSA support to help advance this goal.

In 2011, the United States provided over 1,100 emergency conjunction messages to international satellite operators. Today, this is based on our observations, but as the National Security Space Strategy notes, we encourage other space operators to share their spaceflight safety data to improve the quality of our calculations. This will improve our ability to predict, and thereby avoid, potential collisions. As we continue to work to improve the technical capabilities of our SSA system, we will also work to improve our processes for dissemination to ensure timely and accurate notification of potential collisions.

But there are limits to the size of debris that can be tracked, so it is not enough to merely avoid the debris that can be seen. We must also improve our protective measures, to assure the continued functionality of satellites even after collisions with small particles or micro-meteoroids.

We must strive to minimize the long-term impact of such collisions on the sustainability of the domain. We can achieve this by improving our awareness of the domain and by better protecting our spacecraft from the impact of collisions, especially with debris that cannot be reliably tracked.



Active Removal

The third and final pillar of our approach to stabilize the debris population resides in removing space debris. The President, through the National Space Policy, has directed the Department of Defense and NASA to pursue research and development of technologies and techniques to mitigate and remove on-orbit debris.

Stabilizing the debris population will require removing large, high-mass objects from the most densely-congested orbital regimes. We are working closely with NASA to identify the most promising technologies for debris removal, and are focusing initial efforts on exploring research and technology development to remove large mass objects from critical regimes in Low Earth Orbit. Removing large objects will also require enhanced SSA – to improve our understanding of the most unstable regimes and to better understand the objects that we seek to remove.

As we develop active debris removal concepts, the policy aspects are as important as the technologies themselves—it will be very important to pursue active debris removal in a transparent and cooperative manner. Many countries are already investigating this area, and the IADC has also contributed a scientific basis for better understanding the challenges associated with active debris removal. We will continue to work with international partners as we pursue this pillar.

Conclusion

The United States will continue to take a leading role in the international community. We will work through the United Nations, the IADC, and in other fora to define and strengthen norms against the creation of new debris and to address the challenge of existing debris. But we cannot do this alone. President Obama, in his National Space Policy, called on all nations to “work together to adopt approaches for responsible activity in space to preserve this right for the benefit of future generations.”

The threat posed by space debris was not created by one country alone. And it will not be solved by one country alone. We need your help. I’d encourage you to reflect upon the pillars of our emerging strategy, and to share your thoughts with us and with each other. We must work together, pooling our resources and expertise to tackle this common challenge.

Outer space is a shared domain, and the future use of that domain is becoming less sustainable. It is only by working together that can we stabilize the debris population, and achieve our common destiny through the use of space.

Thank you.