SPACE SYMPOSIUM
The Next Space Age
2 April 2009

As Prepared

DNRO KEYNOTE:

A STRATEGIC PLAN FOR THE NEXT SPACE AGE

I. WELCOME

It's a pleasure to come before you to speak about a new era in the world of space.

II. THE FIRST 50 YEARS

When I heard the theme of the Symposium, *The Next Space Age*, I was immediately drawn to reflect on "the *last* space age." As you may know, in a little over a year the NRO will celebrate its 50th anniversary. In those years, we've witnessed many world-altering events and experienced dramatic shifts in lifestyle, commerce, technology and the global political landscape. The nation's forays into space played a part in many of those changes – Think back to the 21st of July, 1969 when we (at least those of us who were alive back then) watched a man walk on the moon and utter some of the most famous words ever spoken. We watched it on television in the comfort of our living rooms – thanks to satellite communications. It really was a giant leap for mankind few would have predicted four decades ago.

There was a time when ascending to the heavens was a concept reserved for the spiritual domain and science fiction. When the cold war took hold and weapons of mass destruction and rapidly advancing missile technology increased international tension, it became clear we needed to rise above the fray and gain a clear

picture of the threat landscape. This need drove the development of satellites that could observe activities unfolding on the ground.

The National Reconnaissance Office was created to meet that very important need, monitoring weapons development sites and providing strategic intelligence for the nation.

The former Soviet Union and the United States were the first space competitors. Over time the space frontier attracted many pioneers and now satellites from nations around the world orbit the Earth, serving up television, radio, navigation, weather, imagery and communications to millions of customers every day. This reality has come into sharp focus in light of Iran's recent venture into space, and as North Korea's TD-2 launch activities continue to play out on the world stage.

The role of space in today's world is much different than it was at the outset. Space systems play an integral role in our daily lives both at work and at play, and while the capabilities they provide have improved the quality of our lives, at the same time they have opened up a Pandora's box of opportunity for individuals, organizations, and nations with less than honorable intentions.

The NRO has adapted to expanding missions and requirements over time by changing the way we execute operations and acquisitions according to the needs of the day.

III. THE NRO TODAY

In light of a strained budgetary environment, space industrial base issues, interoperability and integration challenges, disaggregated decision-making authorities, and workforce concerns, the NRO's ability to continue to react in a timely manner has become more challenging.

To avoid falling victim to pressing external and internal challenges, the NRO had to take stock of its resources, understand its issues, and make some important decisions. We read the sobering writing on the wall, did the math, and came up with a plan that would lead us through these difficult times and into a new era as a member of the U.S. National Security Space (NSS) enterprise.

I'm excited about the theme of this Space Symposium because it is consistent with the NRO 2009 Strategic Plan and the NSS industrial base outlook.

But before I get into the details, let me set the stage:

IV. STATE OF THE UNION

On January 21st, there was a changing of the guard in this country. With a new president, Congressional turnover, and a number of changes to the leadership in the Intelligence Community, we were presented with an opportunity to provide the new administration with a clear picture of the capabilities our systems deliver to the nation.

The National Security Space enterprise, including the NRO, has received its share of bad press over the past few years due to a few – admittedly serious – setbacks. It's a fact of life: Good news does not make headlines. Unfortunately, in our business, when things are going right, very often nobody hears about it.

The facts are, National Security Space systems, day in and day out, consistently collect and deliver mission-critical data for the nation. It's important to let the people who are going to be making key decisions know that, to hear all the facts, good or bad, not perceptions or wishful thinking, so they can make informed decisions that will affect the future security of our nation.

V. THE NRO ADDRESSES THE CHANGING OF THE GUARD

Our first step was to provide a comprehensive description of our internal structure, acquisition programs, operational activities, and the challenges we face to the Presidential Transition Team, and to our counterparts in the Intelligence Community and the Department of Defense. We delivered a classified *2009 Summary of the NRO* to these stakeholders just as the transition was taking place. We've received positive feedback from people saying that they have a much better understanding of what we do, how valuable these programs are to the nation, the magnitude of the challenges we face, and the changes we have made to address them.

We've also been working hard to inform the Members of the 111th Congress. There are a lot of new faces on the Hill, and on our committees, that are new to space, so we're taking the opportunity to provide insights about our mission, our goals, our programs and the operations we support. We are undertaking this effort jointly with other members of the National Security Space enterprise, particularly Air Force Space Command.

One of our biggest areas of concern, and one that we are collectively emphasizing in our communications with the leadership in D.C. is the need to maintain a healthy space industrial base. They obviously paid attention because so far this year, I've been "invited" to testify twice in the last month on the Space Industrial Base.

The latest hearing took place last Thursday. Believe me when I tell you they were not just sitting there listening politely. They were actively engaged, and not just about their constituencies, but asking questions and really looking for ways to make sure the nation sustains its space leadership. These discussions were not about the NRO but about all of you here in this room. I'll spend some time talking about what we discussed in that hearing room in a few minutes.

I think the National Security Space Enterprise has come a long way toward helping our nation's decision makers understand the

value of our systems and the hurdles we need to overcome to maintain our nation's decisive advantage.

We are restoring confidence in the business processes that make it possible for us to operate these highly sensitive systems in space. The NRO's transformation last year resulted in a complete reorganization of the NRO directorates and business areas into offices more closely aligned with evolving mission requirements and technological development.

We are profiting from this restructuring, which allows for more transparency between disciplines and opens up great opportunities for leveraging lessons learned, process sharing, and integration not just for operations, but for our acquisition programs as well.

As I mentioned, we recently unveiled our 2009 Strategic Plan, which is the implementation guide for the future NRO.

VI. STRATEGIC PLAN

Value Model

At a very high level, this Plan is the *value* model for the NRO:

- **First**, programs must make good business sense as well as good technical sense.

- **Second**, the NRO will focus as much on what it *does* with the data it collects as it does on *collecting* it.

- **Third**, our emphasis is on integration with other Intelligence Community and military collectors and functions.

- **Fourth**, it recognizes that the most critical factor in the NRO's, and for that matter the entire NSS enterprise, long-term success is its government / contractor relationship and joint world-class workforce.

Corporate Imperatives

The Strategic Plan defines three Corporate Imperatives that will guide planning and execution at all levels within the organization, and technical priorities that will provide the context for developing and implementing lower-level initiatives:

#1 - Deliver: Consistently deliver on acquisition and operational commitments. We will continue to provide 24/7 operations and uninterrupted support to intelligence and

operational requirements. At the same time we are committed to delivering new acquisitions on time and on cost, despite the significant pressures we face.

#2 - Achieve Enterprise Integration: This is a keystone of the Strategic Plan, one that will streamline operations, improve information sharing, and significantly reduce O&M costs for the entire Enterprise. Because our space systems will be built as a single, fully integrated, multi-INT architecture, the NRO's goal of providing near real-time fused intelligence to decision makers and those in harm's way will be an every day reality.

Our long-term strategy is to evolve with our mission partners toward a Community-wide architecture. In this construct, intelligence problems are generically tasked across the entire constellation and data from individual systems can be fused to maximize cross-INT capabilities and increase intelligence value for all users.

#3 – Ensure Critical Enablers Are In Place: Ensure the critical enablers fundamental to achieving the organization's objectives are in place; particularly the workforce necessary to support the NRO's long-term success. Our priorities are:

- Build and maintain our world-class workforce by providing training and supporting career development
- Use FFRDCs and the private sector to augment the workforce when appropriate

- Ensure our systems architecture and business strategies are understood by all components of the organization

Technical Priorities

The technical priorities detailed in the Strategic Plan give us a roadmap to build on our primary objective, which is to be the foundation for global situational awareness.

By implementing a fully integrated ground architecture, (We gave the easiest job to Pete Rustan) both within the NRO and across the Community, optimizing the overhead enterprise architecture, "mainstreaming" the lab process, and supporting IC- and DoD-wide transformation processes, we are on track to achieve all of our objectives.

Corporate Initiatives

Lastly, we have established a number of corporate initiatives chosen to help the NRO achieve its vision for the future.

These initiatives are designed to be a strategic catalyst and to provide the foundation for further progress. We are making sure we have an "action plan", not just a philosophy. The success of these initiatives will ensure the NRO overcomes today's challenges and will provide the supporting structure that will help us stay on a healthy path.

VII. SPACE INDUSTRIAL BASE

Addressing Space Industrial Base Concerns

I'd like to talk about a key aspect of the first imperative: Delivering on acquisition commitments.

As I mentioned earlier, we are spending a lot of time and energy on this issue both within the administration and with Congress because we recognize that without a healthy industrial base, we are out of business --- we cannot deliver on our commitments to the nation.

Oversight - SIB

In recent discussions on Capitol Hill, I went into some detail about the major issues confronting the Space Industrial Base today. I talked about workforce concerns and explained how forced competition, specialized technologies, and budget cycles versus system lifecycles have resulted in increased cost and risk as well as the dramatic reduction of our space industry supplier base, and emphasized that if we do not address the issues affecting our industrial base, we risk losing national security space capabilities.

The message is getting through. As a matter of fact some of our overseers have taken up the charge. They recognize it is absolutely critical to create long-term acquisition plans for satellite systems in order to sustain our industrial base. They get it.

Without you, our space industrial base, we can't succeed. That's why this is called out as a top level priority in the NRO Strategic Plan.

NRO Internal Efforts - SIB

We are in the process of developing a comprehensive, realistic strategy to support the NRO space industrial base with the intent of minimizing acquisition costs, improving product quality and mission assurance, and ensuring the long term viability of our limited pool of development contractors and component suppliers.

Our overarching intent is to develop a long-term plan, supported by objective research and analysis, that we can take to our external oversight organizations – and then incorporate into the each major new start.

We are working internally where we can really make an impact, and are collaborating with our National Security Space partners to collectively address areas of weakness or concern.

NSS Enterprise - SIB

The NRO Co-Chairs the National Security Space Industrial Base Council (SIBC) with the Honorable Michael Donley, SECAF and DoD Executive Agent for Space, to address many of these concerns that affect the entire National Security Space Enterprise. The SIBC members include Departments of Defense, State, Commerce, NASA, MDA, Air Force, and NRO. The SIBC is

addressing key focus areas including Work Force, Competition, and Cost and Life Cycle challenges.

We have also partnered with SMC, NASA, and MDA and others to address broad mission assurance issues. Last fall we held the first mission assurance summit co-sponsored by SMC and the NRO. Along with the National Security Space enterprise, we reviewed ongoing issues with our industrial partners.

The first summit focused on collaboration as the path to mission success, engaging all the mission partners and industry to ensure we are all working to the same standards and the same goals. There was a lot of dialogue about near-term challenges – and much of that discussion centered around industrial base issues including funding for critical technologies and counterfeit parts policy concerns. That first summit laid the foundation for some of the initiatives we are developing now. This will be a recurring summit facilitated by the Aerospace Corporation.

Workforce – Government & Industry Loss of Space Expertise

The loss of technical engineering and science expertise is of critical concern to national security space. Our ability to replenish and augment our workforce is rapidly diminishing. We are already experiencing a down turn in the numbers of qualified scientists and engineers available to fill critical positions, and that pattern will continue as the changing economy, demographic trends, and

shifting skill sets and academic tracks reshape the career paths of our citizens.

All of these factors play into our concern that there are and will continue to be fewer individuals interested in pursuing science and technology careers in the intelligence and aerospace community than in the past. In the first four decades of the NRO's existence we were privileged to attract the best of the best of our nation's universities, but competition from industry and other market forces have steered talented professionals into other fields.

In addition, U.S. students are earning fewer science and technology degrees than ever before. Another demographic trend is the number of degrees foreign students are earning at U.S. universities in comparison with the number of degrees earned by U.S. citizens.

In a 2008 National Science Foundation report on global science and engineering indicators, researchers reported that while the number of PhD candidates has remained static over the past several decades, the percentage of foreign nationals receiving PhDs in the United States is increasing at a rapid rate. In the 1980s, for example, one in four PhDs went to non-citizens, by the 90s it was one in three – and the trend continues upward. These statistics only represent degrees from U.S. institutions of higher learning. Other nations are educating and graduating thousands of

highly qualified students every year, with the vast majority earning degrees in science and technology disciplines.

While both government and industry have difficulty recruiting new technical talent, we are also experiencing challenges retaining highly experienced government space engineers and program managers in the mid- to senior levels. Many of these individuals with 15-20 years of space experience are leaving public service for the private sector. This exacerbates the challenge of effectively managing complex space programs. [1]

These trends put the United States at risk of losing its competitive edge, and the NRO, its NSS counterparts, and our space industrial base, at risk of losing their ability to provide the world-class expertise required to maintain global situational awareness for the nation.

The NRO has taken on several initiatives to address this shortage of talent. We are developing a comprehensive approach to providing quality training for its personnel. This approach includes new initiatives with industrial partners and academia, as well as the establishment of the NRO University with a space systems, career-focused curriculum. These efforts will help to improve training of systems engineers and program managers for satellite programs.

[1] 2008 Allard Commission, Recommendation #4, GAO Report 06-908

Competition

Historically, the government has relied on competition as a primary means to obtain best value at the least cost to the nation. However, with the massive consolidation of the space industrial base over the last 20 years, from 40 plus viable contractors to today's narrow field, each with separate domain expertise, a competitive environment may no longer exist for some of our acquisition programs. As a result, in some cases, it's no longer feasible to use competition to obtain best value.

Although we are continually being pushed to move away from "cost-plus" contracts to firm fixed price (FFP) contracts in the belief that this will limit the risk to the government, it does not change the fundamental fact that this is not an assembly line business. I see this push toward fixed price contracts continuing for the foreseeable future. While we are currently successfully executing FFP programs, and certainly do not rule this out for the future, this acquisition strategy must be balanced with the real potential for increased cost of new, innovative developments. This approach must be used prudently.

Cost and Life Cycle Challenges

As you well know, many of our satellites are one-of-a-kind, hand-built systems that demonstrate the best in industrial science, engineering and manufacturing. They are feats of extraordinary technical achievement and by definition take time, skill, and money

to design, develop, build, launch, and operate. Their cost, timelines, and the sensitivity of their missions set them apart from other types of government acquisitions, and create a difficult situation for their industrial base suppliers. Without steady satellite production contracts, these suppliers simply cannot, and in some cases have not, stayed in this business.

We're not just talking about the prime contractors building the major components. We've learned that small, seemingly insignificant parts can virtually halt satellite and launch vehicle production when the reconstitution of related production lines or qualification of alternative suppliers becomes necessary. We need to address the sub-tier supply base to keep the house of cards from crashing down. The sporadic and low volume demand for space qualified components has made it difficult to compete with commercial demand and develop sound business models. The National Security Space Industrial Base Council is engaging Congress to explore ways to resource critical production lines to avoid future parts issues.

VIII. ACQUISITION SUCCESS – NOW AND NEXT

For 36 years, one of the NRO's most long-standing programs has successfully delivered multiple systems in support of the U.S. overhead reconnaissance mission, adapting over time to expanding mission requirements. Steady, ongoing production has played a significant role in the continued health of one element of the space industrial base. This program is a testament to the

importance of stable program budgets to program success, and underscores the value of a healthy, sustainable industrial base.

Recently, the NRO began a new acquisition with a procurement strategy that takes the industrial base into account from the beginning. This acquisition leverages decades of government investment and the proven experience of a prime contractor, and is making it possible to procure satellites that will replenish systems supporting two separate missions. We are streamlining our technical baseline by increasing commonality between two constellations. It's a winning proposition for the taxpayer and industry: this acquisition strategy will stabilize factory loading and optimize overall costs for an ongoing procurement.

This is the beginning of a real success story; one that the NRO will replicate when appropriate. When is it appropriate? If we have a long-term requirement for the capability, a proven industry partner, a commitment to stable funding, and a known design with decreasing recurring engineering and production costs, we will take that path.

Guiding the NRO's Next Space Age

The NRO has returned to the acquisition rigor that has been successful in the past. With our future acquisitions, we are aggressively pursuing and advocating a rigorous pre-acquisition phase, one which is adequately funded and given the time needed to do the up-front work necessary to reduce program risk. It is

vitally important that our planning takes into account systems engineering, technology and manufacturing maturation, detailed engineering analysis, the use of independent cost estimates, and robust requirements development.

These pre-acquisition activities are key to program success. We need to invest adequate time and resources if we are to maintain program viability. An investment in adequate pre-acquisition is our best opportunity to avoid expensive problems in the future, like those we have seen in the past.

As we look to the future we recognize we aren't going to solve the space industrial base problems overnight. It's going to take dedication and determination on the part of the Intelligence Community, Department of Defense, the civil space agencies, Industry and Congress, to breathe new life into the space industrial base.

Our acquisition approach must take into account and articulate an industrial base strategy to ensure the foundation for National Security Space and the United States space industrial base, is solid, stable and ready to deliver.

Message to the Space Industrial Base

I want you to leave here today with a renewed sense of confidence that we, your customers, understand our responsibility to you, the space industrial base, who hold the keys to our future.

We recognize the importance of sound, well-defined requirements, achievable government plans coupled with stable budgets, and the need to invest in the human capital that make it all possible.

We need to make sure these principles flow down to our prime contractors and the second and third tier vendors and suppliers through concrete plans and steady-state production. Whenever it makes sense the government should be willing to invest in multiple-unit or block buys when acquiring systems to achieve the effectiveness and stability that this can promote.

We are working diligently to build a realistic plan that goes beyond the FYDP to address the acquisition and operational life cycles that characterize National Security Space programs. It's our job to make sure that today's decision-makers understand that the Future Year Defense Program budget cycle for National Security Space is nothing more than a planning tool. It is NOT a long term investment strategy for our Space Enterprise.

IX. CONCLUSION

This is an exciting time for the NRO. We found ourselves at a crossroads and made some hard decisions. We chose a path (not the path of least resistance, by the way) and despite multiple challenges along that path, we have made great strides in many areas. Many of you have already experienced changes as a result of our Transformation. There have been some growing pains, but I

think we're at the point now where we are really beginning to see the positive impact of our efforts.

As we roll out the Strategic Plan and begin to implement the Corporate Initiatives that will help us achieve our goals, those of you who are involved in NRO programs will see even more changes for the better.

As the transition between the last space age and the next unfolds, we are confident that the National Security Space Enterprise will play a vital role and the NRO's plan for the future will provide the structure and ground rules we need to lead us into a new era of excellence in acquisition and operations. With this foundation in place, the NRO will be poised to overcome the challenges of today, and ready to anticipate and answer the challenging intelligence problems that may emerge in the next space age.

Thank you.