Adjunct Professor of International Affairs

September 2, 2008

MEMORANDUM FOR: **COLONEL MIKE MEESE**
United States Military Academy

CC: **COLONEL CINDY JEBB**
United States Military Academy

SUBJECT: After Action Report -- General Barry R McCaffrey USA (Ret)
Adjunct Professor of International Affairs, USMA
VISIT TO AIR FORCE SPACE COMMAND
Peterson Air Force Base - Colorado Springs, CO -- 5 August 2008

1. PURPOSE:

- This memo provides an independent operational assessment of Air Force capabilities and requirements based on extensive presentations and demonstrations at Air Force Space Command.
- Note attached book of unclassified USAF briefings/slides and fact sheets.
- Look forward to de-briefing you and the department faculty at your convenience.

2. SOURCES:

1.) **General Bob Kehler, Commander, Air Force Space Command.** Peterson Air Force Base, CO.

2.) **Brigadier General Jay G. Santee, Vice Commander, 14th Air Force, Air Forces Strategic-Space.** Vandenberg Air Force Base, CA.

3.) **Brigadier General Stanley T. Kresge, Director of Air, Space and Information Operations.** Headquarters Air Force Space Command. Peterson Air Force Base, CO.

4.) **Brigadier General David B. Warner, Director, Communications and Information and Chief Information Officer.** Headquarters, Air Force Space Command. Peterson Air Force Base, CO.

5.) **Colonel Jay Raymond, Commander, 21st Space Wing.** Peterson Air Force Base, CO.

6.) **Colonel Bob Wright, Commander, Space Innovation and Development Center and Vice Commander, 14th Air Force.**

7.) **76th Space Control Squadron --**Tour and Briefings. **Colonel Chris Crawford, Commander, 21st Operations Group. Captain Bobby Hutt, Vault Chief, 21st Operations Support Squadron. LTC Jennifer Moore, Commander, 76th Space Control Squadron.**

8.) **50th Space Wing Tour** – Tour, Working Lunch. Force Enhancement Briefing -- **Colonel Cary Chun, Commander, 50th Space Wing.**

9.) **Corona Fall – GPS: Weapons Networking.** Briefing. **LTC Todd Diel, Captain Andy Kohn, Major Rene Hernandez.**

10.) **3rd Space Operations Squadron (3 SOPS)** – Tour and Briefings. **Defense Satellite Communications System (DSCS) Program and Wideband Gapfiller System (WGS). LTC Brent McArthur**

11.) **GPS Ops Floor.** Tour and Briefings. **LTC Doug Schiess, 2nd Space Operations Squadron (2 SOPS/DO)**

12.) **Space Innovation and Development Center.** Briefings – **Corona South (3 SES).** Tour **3SES Ops Floor. LTC Jeff "Heater" Hokett, 3 SES/CC.**

3. THE CONCERN:

"In future space wars, the main operations will consist of destructive satellite attacks and counterattacks, as well as jamming and anti-jamming operations."

-- Liying Zhan, ***Lanfang Army Missile Academy*****.**

4. THE US AIR FORCE SPACE COMMAND:

AFSPC (Service component of the Joint Headquarters US SPACE COMMAND)

- A huge global command with 40,000 people (25,000 active duty and civilians --- 14,000 contractors).
- They command, secure, and train the people (10,000 personnel) and machinery which constitute our national ICBM Force. These are the most important weapons to maintain peace in the US global arsenal.
- The command does all medium and heavy-lift space launches for the nation to put satellites into orbit.
- They run our global satellite communications and provide all joint commanders with environmental information. (Weather, etc.) This is the glue that holds the US Armed Forces together.
- They run the joint GPS satellite system. In our modern US joint forces, nothing high tech works if GPS is not operational and defended.
- They have the direct-- and much debated and envied by parent Air Force-- responsibility to manage the acquisition of space systems (6,500 professionals). A good thing in my estimation. The system is fast, professional, based on a non-military business model, and responsive.) Their mission is to recapitalize and modernize our satellite systems and fix the significant and underfunded vulnerabilities in space assets through tactics, hardening, countermeasures, and the ability to reconstitute neutralized or destroyed systems.
- They provide surveillance of the space frontier and provide space and ground based missile launch warning. (17,000 + objects and growing. The Chinese ASAT event of 2007 left 69% of the particles of the destroyed target satellite in space.)
- Commanded by Air Force four star Bob Kehler. He is a specialist in: space operations, integrated missile defense, computer networks operations, nuclear war planning, ICBM operations, space launch operations, and space superiority and deterrence. Educated at Penn State, MS University of Oklahoma, MA Strategic Studies Naval War College, and graduate study at Harvard University and Carnegie-Mellon University. Missile combat crew member and instructor. One of the most intellectually brilliant, experienced, knowledgeable, zero-ego officers I have ever encountered. General Kehler has worked to de-mystify the work of the command. The language is joint terminology that makes sense to a non-physics college major. They have integrated their operations with the

global joint commanders. They have forward Space Ops cells in the combat areas, and aggressively rotate their people forward to the battle zones. They respond immediately to tactical concerns by air and ground commanders' --- e.g. US Army ATACM's targeting problems in Ramadi.

The senior leadership and management team is extraordinary. This is one of the most impressive groups of senior leaders I have ever interfaced with at the grade of Captain through General Officer. Air Force Space Command provides the incubator to recruit, train, mature, and position some of the most remarkable professionals I have ever encountered. Their job titles and experience levels are the stuff of Star Trek.

The career of BG Jay Santee the 14th Air Force Vice Commander is a case in point: His command has 28 weapons systems and 12,000 personnel in 155 units --- in 44 global operations. He has previously commanded a Space Warning Squadron, a Space Operations Group, and a Space Wing. A distinguished graduate of the Air Force Academy, the Squadron Officers School, and the National War College…he also has 120 combat flying hours in an F111 during Desert Storm.

The people of Air Force Space Command are a national treasure. We had better not screw this up. It takes 15 years of patience and training to grow a Space Command Lieutenant Colonel. This is no place for a generalist.

5. ANALYTICAL PURPOSE AND CHALLENGES:

My intent with this AAR as well as my previous report on US Air Force capabilities (dated 15 October 2007) is to spur a wider debate and analysis of the degraded state of the US Air Force and US Naval Forces. These crucial high-technology air and naval capabilities are essential to the deterrence of threats to our international political, economic, and security interests in the coming 15 years. The bitter war in Iraq and Afghanistan has understandably diverted defense manpower, dollars ($750 billion), and creative energy to ensure survival and victory on an active and bloody battlefield.

There is, of course, a clear recognition on my part that the inadequate manpower and the gravely weakened equipment readiness of our ground combat and special operations forces must be repaired and modernized as we successfully come out of the Iraq operation in the coming 36 months. This paper and those that will follow are not meant to argue against the vital need for robust and technologically advanced ground combat units in both the active and reserve components. At some point, all warfare ends up with a bitter struggle waged by direct combat ground forces of brave and isolated soldiers and Marines. Our 36,000 killed and wounded in the ongoing struggle in CENTCOM attest to this enduring reality.

It is difficult in an unclassified forum to debate the investment decisions and strategy of our Joint Space Components. We still have some stunning technical and operational advantages, as well as some extremely worrisome and growing vulnerabilities which can only be analyzed and argued in a closed congressional or military environment.

None-the-less, we can assert without qualification that the current $10 billion Air Force space strategy is under-resourced and severely constrained by inattention and excessive caution on the part of our executive and congressional national security establishment. These global space functions are invisible to many of the end users, and too complex to be easily understood and debated in the legislative arena.

Unfortunately, these vital space functions also operate in an unforgiving zero-defects technical environment with a huge investment cost that rapidly gets traded off by competing defense priorities. Satellites, UAV's, cyber warfare, and sensors lack the immediacy, visibility, and military glamour of high-performance aircraft.

The debate on space functions and technology is constrained by the intimidating nature of space physics and engineering language and terminology.

Finally, it is an unfortunate by-product of our current domestic political climate that during the most dangerous period in history for the proliferation of nuclear technology and delivery systems, the modernization and readiness of our principle tool of nuclear deterrence, which is our US ICBM and SLBM strike capability, has become radioactive as a defense program.

Nobody…. but nobody…. wants to stand up in the public forum and say clearly that the single most important DOD defense responsibility is the maintenance of viable, cutting edge nuclear strike and anti-ballistic missile defense capabilities.

There can be no new successful international non-proliferation agreements without continued support for a fully modernized US nuclear offensive and defensive capability. (In February 2007, an ad hoc US SPACECOM team hastily put together an emergency satellite missile attack capability on a US Navy Aegis Cruiser --- which then nailed a dangerous falling US satellite at an altitude of 270 kilometers with a direct kinetic kill on a target a couple of feet in diameter. The world took note.)

6. THE BOTTOM LINE:

1st: The US Air Force has owned the space domain for 50+ years with no serious threat to our dominance of the high frontier. That golden era has come to an end.

2nd: The control of space is central to all US Joint Operational Forces and net-centric warfare. We lose 35 years of modernization if we lose space.

3rd: If US orbital assets and control are put at jeopardy, then our joint ground-sea-air combat effectiveness is degraded by an order of magnitude.

4th: This US space dominance superiority gap is rapidly narrowing. Both nations and non-state actors have now obtained or are leasing space capabilities.

(Russia, China, India, Japan, EU, Israel, Taiwan, Brazil, Argentina, Algeria, Morocco, Saudi Arabia, and others)

5th: Several nations and non-state actors have created active, effective anti-satellite offensive warfare capabilities.

(Alternative Options: kinetic impact weapons, electronic jamming, laser heating or pulsed laser mechanical effects, chemical attack of orbital surfaces, ground attack against control sites, intense RF energy, nuclear direct attack with gamma rays and neutrons, attack with indirect nuclear effects above the atmosphere, intense beams of neutral particles.)

6th: The Russians (April 1980), the United States (September 1985), and the Chinese (January 2007) have clearly demonstrated in the unclassified world a direct kinetic kill ASAT capability.

7th: Space is getting more crowded and more dangerous. There are 450 active foreign spacecraft in orbit today. (300+ are COMSAT's in geostationary orbit.) By 2010 there will be more than 600 foreign spacecraft. Satellites are now being launched from 12 known foreign launch sites as well as from sea launch locations.

8th: Space is getting cheaper, smaller, and commercial.

(In 1993 when I was on the Joint Staff --- US satellite capabilities were tightly compartmented and highly sensitive. Today with nano-technology and modern engineering, foreign commercial SAR satellites are being deployed with ground resolutions of three feet that can image day or night through all weather conditions. You can Google Russian, French, and other asset space imagery from a terrorist cave home computer.)

(Panchromatic and multi-spectral satellites of less than 500 pounds, which are the size of a large-screen TV, will have 8 foot ground resolution.)

(Satellites now being launched are as small as 2.5 pounds.)

7. LOOKING TOWARD THE FUTURE:

My take on Air Force Space Command yields eight key judgments about the coming space environment. Many of these conclusions are de-stabilizing to US national security. Most of these rapidly emerging new realities can be mitigated or turned to our advantage by smart investments and newly invigorated national leadership and creativity.

1st: The total number of foreign satellites in orbit and their capabilities will dramatically increase in the coming decade with both peer group competitor states and non-state actors posing a new and dangerous threat to US space dominance. The EU will have a commercial capability that will rival that of the US.

2nd: Adversaries to include criminal organizations and terrorist groups will acquire from third parties the capabilities to destroy, deny, and deceive US space systems.

3rd: Several countries, to include the current Russian and Chinese capability, will pose a direct kinetic threat to US on-orbit assets.

4th: Russia will become the dominant international leader in military space capabilities during the coming decade.

5th: The US will lose the ability to conduct covert military operations as we are denied concealment and deception by the wholesale proliferation of high-quality imagery and SIGINT satellites in the possession of our adversaries.

6th: The capability to conduct electronic attacks against our satellites will be a tool in the hands of terrorist and other non-state actors if we do not rapidly invest in new hardening and other defensive technology.

7th: Terrorist and state actors will actively prepare to attack US ground satellite control capabilities.

8th: All international commercial, civil, military and government actors will become centrally and absolutely dependant on global high-quality satellite communications and GPS capabilities. This is an opportunity and a threat at the same moment.

8. SUMMARY:

The next Administration will have at most a year to analyze a series of difficult strategic and investment space decisions before US global superiority will start rapidly eroding.

Our under-funded national defense system at 4% of GNP (during a major war in the CENTCOM AO with a burn-rate of $12 billion per month) has distorted our modernization efforts and priorities.

It is time for a new assessment of the strategic risk we face and a renewed sense of energy to modernizing and changing the strategic posture of our global forces.

Barry R McCaffrey
General US Army (Retired)
Adjunct Professor of International Relations
USMA West Point, NY