

Cyberspace Dominance, the Information Mosaic and Precision Strike

Secretary of the Air Force Michael W. Wynne

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Thank you, Bill Dalecky (Chairman, Precision Strike Association) for the introduction, and thank you to Johns Hopkins for hosting.

I'd like to also recognize my fellow members of the Joint Team and our Industry partners who support our Soldiers, Sailors, Marines, Coastguardsmen and Airmen.

In 1990, no one knew that we'd be still be engaged in combat in 2006—yet you kept developing warfighting capabilities.

Industry has sustained us in this Long War, bringing in innovation (and assuming risk in JDAM, ROVER, and UAV production for example)

Forums such as this are vital to pushing the bounds of capability in Air, Space, and Cyberspace.

By having some of the brightest people in our country discuss the latest in precision weapons, targeting, and tactics, you bring even greater capability, thinking beyond the current, and into the future.

You heard Secretary Harvey yesterday, and I assure you the Air Force is shoulder-to-shoulder with the Joint Team in the Interdependent Fight.

Today I want to talk about Cyberspace Dominance, the "Information Mosaic," and the future of Precision Strike.

I will start with a video that puts the subject in the context of the war as fought today.

But first, let's place Precision Strike and the Fight on today's battlefield in some context:

- The Mission of the Air Force is to deliver sovereign options for the defense of the United States of America and its global interests—to fly and fight in Air, Space and Cyberspace.
- "Delivering Sovereign Options" means operating across the Joint Spectrum so that we provide to the President scalable choices that are unlimited by distance and time, and span the entire range from humanitarian assistance to nuclear strike.

This includes the powerful option to use timely information to deter and to avoid use of kinetic weaponry. General LeMay emphasized this when he said, "Peace is our Profession."

All these options have one common foundation -- persistent, lethal, overwhelming Air, Space and Cyberspace power massed and brought to bear anywhere, anytime.

Thus, the Air Force serves as Strategic Guardian of our country, and as Strategic Lead by setting the conditions for victory by means of deep strike into the heart of the lines of communication of the foe.

General Moseley likes to say, "the soul of an Air Force is Range and Payload." I would salt and pepper Persistence in there as well. That is why after 53 years we are again seeking Strategic Assets in the form of new tankers and bombers to meet our Strategic responsibilities.

As you watch the video I ask you to consider two questions:

- How do we defend the net on which all our capabilities depend?
- What new Habits of Thought do we need to adopt in order to create and develop precision strike technology, and to fight in the 21st Century?

View Video - The Interdependent Fight

This video emphasizes how far our Air Force has come with Precision Strike.

In World War II it took 1,500 B-17s dropping 9,000 bombs to destroy a given target; today one B-2 can strike 80 different targets on a single mission.

This course will continue to improve with one B-2 soon able to carry 80 independently targetable 250 lb. Small Diameter Bombs.

These order-of-magnitude improvements in capability were enabled by information technology pushed through Cyberspace.

Also, the video illustrates the components of what I call the "Information Mosaic"—the whole net of data, analog and digital; pixels and composites images; from all sensors that can be collected and downloaded and cross-loaded for use by all in the Fight.

By filtering critical data from the "Information Mosaic" to the strategic planner and right out to the weapon system itself, we increase flexibility and lethality.

The video points to Space as well. It makes apparent that access to Space, and operating in the Space Domain as we do today, is fundamental to our new way of war. For example, nearly every system in the video relies on GPS. And imagery from space is a constant part of the mosaic on which those commanders rely.

The video talks of the Interdependent Fight. It refers to integrated and network-enabled systems that put the capability of airpower in the hands of a single soldier.

With flowing data and situation awareness across our joint forces, our interagency and Coalition partners will also have access to the same information.

The ROVER system is an example: streaming video from any aircraft targeting pod (SNIPER, LITENING, LANTIRN) is sent directly to a laptop on the ground.

Interdependence is an evolutionary step upward, where every sensor can be a shooter—and almost every shooter a sensor—linked across all domains

Interdependence both makes possible and also grows from what I call Spherical Situation Awareness—the full integration of all pertinent information from the net.

Our current acquisition programs aim to further this Spherical Situation Awareness, adhering to the principles that encompass Precision Strike: gaining access, rapid strike, and global persistent attack.

Before I review the trends and future of Precision Strike, let's look at the two questions I asked before the video:

First, How shall we defend the communication net on which all our capabilities depend? This question is critical:

- Our ability to fight in Ground, Sea, Air, and Space depends on communications that could be attacked through Cyberspace.

- The capital cost of entry to the Cyber Domain is low. The threat is, that a foe can weaken the network that supports our operations in the battle domain.

The answer is that defending and fighting in the Cyber Domain is absolutely critical to maintain operations in Ground, Sea, Air and Space.

The Second Question is, What new Habits of Thought do we need in order to create and develop technology, and to fight in the 21st Century?

The answer is to think in terms of Trust. Our operations in each of our Services all rely on Trust.

- That is, the pilot can trust that the information given that a target is the foe, not an innocent school building or hospital or embassy.
- The ground fighter with a communication device can trust that the device is not being tracked by the foe, exposing the ground force unnecessarily.
- This New Way of War is data-dependent. So we need to think in terms of Trust and securing Trust.

But we also need to think in terms of downloading and transmitting information and of Open Architecture—of the Habit of Thought of ensuring that all information that is captured by a sensor, in air, space or cyberspace or ground or sea, is transmitted across all domains to all on the Interdependent Team.

It is this transmission that creates and expands the Information Mosaic.

Let's look now at the trends in Precision Strike itself, in light of the video, and of the need to defend, and to preserve Trust.

Our program for F-22A/F-35 secures the future for our 5th Generation team to preserve the Air Dominance which is the foundation for the Interdependent Fight.

The F-15C/F-16 4th Generation mix has been highly successful

- However, proliferation of increasingly capable international aircraft & double-digit SAMs means we are not guaranteed future air dominance if we don't work at it.
- That dominance not only gives us freedom from/to attack, but is required to allow our sensors to feed the Information Mosaic

The F-22A Raptor's stealth, speed and integrated avionics allow it to detect, identify, and target threats, both air- and ground-based

- In a recent PACOM exercise, F-22s worked with Joint Special Operations Forces to put eight of eight 1,000-lb weapons on targets designated by and in support of Navy SEALs
- An F-22A which was out of weapons was asked to stay in the fight and off-board targets to other weapons carriers, because it has the best sensors.
- The F-35 Lightning II will bring added sensor-fused targeting, situational awareness, and persistence to the Joint and Coalition Team, with all-weather, precision air-to-surface employment across the spectrum of missions
- This team delivers us access and brings an added dimension that the F-15/F-16 mix could not—these new fighters will be our front-line ISR platforms.
- With access to airspace that traditional ISR platforms do not have due to the threat environment, they will "Hoover up" all kinds of data, bringing our warfighters Spherical Situational Awareness

While our 5th Gen fighters bring us short-range access, we have Long Range strike to complement our Precision Strike capability.

As to Long Range Strike: Our Rapid Persistent Strike capability will boast networked-enabled weapons, ISR capability and open architecture, without the need for overseas basing.

I know Col Litton has briefed our three-phase Long Range Strike strategy, but I want to emphasize the open-architecture design that will allow our Next Gen Bomber to be an ISR platform as well:

- Phase I: You saw how we are committed to modernizing the bomber fleet of B-1B's, B-2A's, and B-52H's, ensuring sustainability and effectiveness.
- Phase II: By fielding the Next Generation Bomber and leveraging near-term technology, we'll ensure interoperability between the joint/coalition team, flexibility in employment, and the ability to easily upgrade.
 - To reduce support packages, it will contain robust Electronic Attack and suppression of enemy air defenses systems.
 - With fused sensor suites, including Electro-optical/Infrared and Active Electronically-Scanned Arrays, the Next Gen Bomber will provide global situational awareness on targets, threats, and blue forces for positive ID and non-traditional ISR capability.
 - In Phase III, we're looking to develop advanced capabilities for the 2035+ timeframe.

With our Precision Strike aircraft acting as front-line ISR sensors, integrated with orbiting platforms and unmanned aircraft, the Information Mosaic will allow sharing of data and digital cueing for our Global Persistent Attack capability:

As to Unmanned Aerial Systems: The Unmanned Aerial System provides us with on-demand "full spectrum dominance"

- Controlled either locally or via control centers located on the other side of the globe, they have engaged and/or located high value targets within the AOR with huge success.
- Predator's and Reaper's full streaming video let commanders find, fix, defeat and assess with more and more speed. It needs to go digital—thus helping with security and bandwidth.

As to space:

The President has released a new statement of National Space Policy that emphasizes the vital role of Space. It states our principles, goals and way forward.

The Policy states, in part: "The United States considers space capabilities—including the ground and space segments and supporting links—vital to its national interests. Consistent with this policy, the United States will: preserve its rights, capabilities, and freedom of action in space; dissuade or deter others from either impeding those rights or developing capabilities intended to do so; take those actions necessary to protect its space capabilities; respond to interference; and deny, if necessary, adversaries the use of space capabilities hostile to U.S. national interests."

We benefit from the technology and endurance of our constellation of satellites, but we are long overdue for recap and upgrade.

Our plan is to replace the entire satellite inventory in the next 10 to 15 years.

Our GPS recap program, an integral part of Precision Strike, continues to progress, with the latest block, GPS IIR-M, successfully launched just a few weeks ago (Sept. 25).

The Advanced Extremely High Frequency (AEHF) Communication system is on track to meet the first launch in April 2008, offering at least ten times the data and communication capacity of Milstar II, bringing greater

utility to the information mosaic.

Given these trends, what can we see in the future of Precision Strike? Most specifically, what is the Future that you can help us create?

Your Air Force is "minding the future," strengthening system architectures and addressing technology improvements to balance capabilities in range, payload, survivability, persistence, and strike responsiveness for the warfighter.

We see a future where every platform has fully netted combat command and control functions with secure assured communications.

These communications will all be part of the Joint Global Information Grid, with secure reach-back and reach-forward capabilities.

As we talk of future capabilities; I'd like to point out some that draw heavily from Cyberspace and the Information Mosaic:

- We are pursuing automated air refueling concepts applicable to manned or unmanned platforms
- We're working on the integration of high definition, high-resolution cameras on the EO/IR multi-sensor targeting systems, and the synchronization of full motion video frames
- We are close to the development and demonstration phase of DARPA's Video Verification of Identity capability, which allows for precise detection and tracking of single and multiple targets under any environmental condition
- We are aggressively pushing to digitize all information, to free up bandwidth used by analog signals, and for easier encryption.

We can also foresee an actual display of the Information Mosaic for the fighter:

Cyberspace dominance will allow us to improve the "Information Mosaic," where the goal is to be able to type in any GEO Location and get full RELEVANT (what, where, when) data

- This Mosaic is irrelevant unless it is interoperable across ALL networks:
 - Within DOD (Combatant Commands, Coast Guard, National Guard, Reserve),
 - Other government agencies (DHS, DOJ, DOT, State, and Local systems)
 - And Civilian Emergency Management agencies and First Responders
- The key to integrating these agencies may well be Cursor on Target: This will be the protocol which allows data interoperability and fusion data from these various sources.
- Cursor on Target appears to allow the tracking and sharing of information from thousands of assets, like the state police, cargo ships, border checkpoints, nuclear plants, unmanned vehicles, and first responders.

I recently witnessed a demonstration of this display system with testimonials from First Responders, Special Forces, FEMA Officials and Airmen.

Target information was fused from a laser range finder, a compass, and a GPS receiver and then sent to an intelligence system to be refined for high-precision resolution.

From there the data was relayed to a jet fighter and automatically downloaded to onboard precision-guided munitions.

All these interchanges were handled machine to machine.

Distinctions between sensor, strike, and support systems will blur as the information mosaic flattens the world and tightens the transaction rate of digital, relevant, real-time information.

As I draw to a close, let me remind you: these future technologies all share a common backbone - they assume that we have Cyberspace dominance, making Cyberspace a center of gravity to protect and exploit.

This is why Air Force Chief of Staff General Moseley and I are standing up a Cyberspace Command, devoted to exploiting this domain.

And let me leave you with this final question, for your thought and further discussion on Precision Strike:

How Do We Prepare, Mass and Deliver Precision Strike in Cyberspace?

Thank You.