The Precision Strike Digest

4th Quarter 2009
Vol.22, No.4

"From Cruise Missiles Association to Precision Strike Association we have been dedicated to advancing the art and science of precision engagement concepts and technology for more than 20 years."

PSA
PRECISION STRIKE ASSOCIATION
Affiliate, National Defense Industrial Association

VISION STATEMENT

We aspire to be the premier association dedicated to advancing the art and science of precision engagement concepts and technology. To accomplish this, we will promote the development of systems and procedures in order to locate, fix, track, target, and attack fixed, moving, and relocatable targets. We recognize that battlespace management, the network within which it functions, and the adjunct command and control requirements are crucial to success on the battlefield. PSA has a global perspective and welcomes international participation.

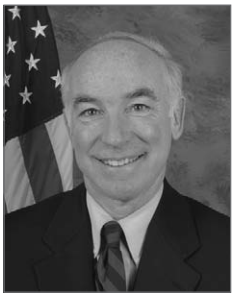
WRT-10 to Focus on Key National Security Challenges

Strategic Challenges for Precision Engagement is the theme for **Winter Roundtable 2010 (WRT-10)** scheduled for Wednesday, February 10, 2010 at the Crystal Gateway Marriott. This popular one-day forum, sponsored by the Precision Strike Association (PSA), will address national defense policies, strategy and congressional perspectives.

PSA continues to see the growing importance of precision strike systems in shaping our national defense posture and influencing events around the world. The objective of this forum is to provide you with a deeper understanding of options, issues, and choices that will define alternatives for our national defense policies and strategy.

PSA is delighted to present the Honorable William J. Lynn, Deputy Secretary of Defense, as keynote speaker. Further, we are pleased that a National Security Council Senior Advsior will address the strategic environment. Additionally, we are excited that Representatives Joe Courtney (D-CT, 2nd District) and Mac Thornberry (R-TX, 13th District)—Members of the House Armed Services Committee—will address the precision strike community as well.

Honorable William J. Lynn, III — DepSecDef



Rep Joe Courtney
D-CT, 2nd District

Rep Mac Thornberry
R-TX, 13th District

Deputy Secretary of Defense Lynn will highlight the Quadrennial Defense Review (QDR-10) and address its major recommendations and the challenges ahead in adapting the U.S. defense strategy and posture.

The White House senior advisor will respond to a security environment in which the United States military forces are actively engaged in Iraq and Afghanistan.

Both congressmen will focus on their perspectives related to activities in which they are engaged on the House Armed Services Committee.

They are four of a host of numerous top visionaries and strategy experts who will talk about policies and strategies that impact precision engagement to help us better define

See **PSTS-09,** Cont. on page 18

IN THIS ISSUE

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Chairman's Column

I hope you were able to attend this year's *Precision Strike Technology Symposium (PSTS-09)* at Johns Hopkins University Applied Physics Lab (JHU/APL). If so, you were treated to arguably our finest lineup of speakers and presenters to date.

Once again, the Programs Committee, along with the Event Chairs and Technical Chairs, put together a very dynamic and powerful classified program. There were many incredible presentations, one of the highlights coming on the first day in the form of an extraordinary keynote address by USMC LtGen Duane Thiessen, the Marine Corps' Deputy Commandant for Programs and Resources.

We were also honored to have members of Seal Team 10 in our presence, providing us with personal insights from the selfless few who place national service and our security above self.

At PSTS-09 we also had the honor of introducing the Richard H. Johnson Award. Acknowledging the accomplishments of those previously unheralded, the Precision Strike Association (PSA) will annually bestow this technical achievement award, recognizing an individual from the public or private sector for outstanding personal technical achievements resulting in a significant contribution to precision strike systems. This first award was presented to the family of Dick Johnson, the namesake of the award, in a very warm and personal ceremony.

Many thanks to JHU/APL for their continued support and to Mr. Keith Sanders, OUSD/AT&L (AW), for his untiring commitment to the precision strike community.

The autumn foliage is now a rapidly fading memory, as is last year's U.S. defense budget. We now dive headlong into a new fiscal year. Awaiting the actual Fiscal Year 2010 defense budget, we are left to languish in the uncertain world of continuing resolutions. This leaves us looking forward to the Winter Roundtable 2010, a perennial favorite that returns to our events lineup on February 10th. We will once again discuss a full and robust set of strategy and policy issues facing the U.S. defense establishment.

There are many questions surrounding current U.S. defense policies and Winter Roundtable 2010 will be an excellent opportunity to get the most up-to-date information that you can apply to your strategic business plan.

We will also highlight a major achievement for the precision strike community. *The William J. Perry Award* recognizes leadership and/or achievement that results in significant contributions to the development, introduction or support of precision strike systems.

Mark your calendars now and we'll see you in February!

Andy McHugh
Chairman of the Board
Precision Strike Association

PSTS 2009 Wrapup

The Precision Strike Association (PSA) held its 19th Annual Precision Strike Technology Symposium October 27-29, 2009, at the Kossiakoff Conference Center at the Johns Hopkins University Applied Physics Laboratory (JHU/APL) located in Laurel, MD.

Under the able leadership of Ginny Sniegon (PSA Programs Chair), Dr. John Walters, George McVeigh and Harvey Dahljelm tri-chaired this very successful three-day SECRET/NOFORN symposium by focusing on the theme *Improving Precision Weapons to Win the War on Terror*.

Through the 2010 Quadrennial Defense Review (QDR) process, DoD has been assessing the threats and challenges the nation faces with regard to both today's conflicts and tomorrow's threats. PSTS-09 showcased advanced technologies that present opportunities to the future of warfare.


Dr. Ira Blatstein

Dr. Ira Blatstein, Director of Strategic Planning at JHU/APL, welcomed the PSTS-09 attendees to the 19th PSTS hosted at the Applied Physics Laboratory.

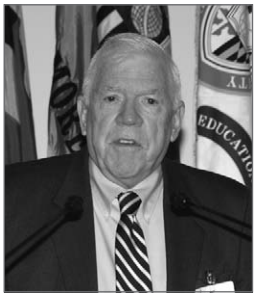
In his remarks, Dr. Blatstein noted that Information Superiority assumed by Joint Vision 2010 is being compromised by our lack of Information Assurance on our networks and potentially our weapon systems. This serious Information Assurance threat to our networks and weapon systems is caused by:

- The hardware, operating systems and many applications in use by our combat forces are proprietary commercial equipment, which is equally available to our adversaries.
- Further, much of the hardware, operating systems and applications are built by our adversaries, and include security "flaws" of which users have little knowledge or control.
- Finally, the wide spread use of common commercial equipment across the globe creates large numbers of individual malcontents (hackers), criminal organizations and national entities focused on exploiting vulnerabilities in this commercial equipment to their common, or respective advantages.

Dr. Blatstein pointedly noted that restoration of Information Superiority in our networks and weapon systems may be our industry's greatest challenge.


Rear Admiral William E. Shannon III, USN

Rear Admiral William E. Shannon III, USN, Program Executive Officer for Unmanned Aviation and Strike Weapons (PEO (U&W)), briefed "Navy weapons development and Network Enabled Weapons." He reviewed the weapons evolution from 1985 to 2015 for naval precision weaponry and their inclusion on strike aircraft. He forecast that future needs must be networked and interoperable with joint forces (Machine-to-Machine), possess the ability to move tactical war fighting information seamlessly on/off the aircraft and across a networked force, and manage at the interface level. Admiral Shannon closed with the idea that UAVs are destined to become the next evolution of the world's air combat forces. The integration between manned and unmanned systems will be the first step in meeting those future systems, today.


Dr. John Landry

Dr. John Landry from the National Intelligence Council followed by presenting an intelligence perspective on precision operations. He focused on key weapons development demands that addressed the lethality/survivability dependence on accurate mission data and noted that intelligence data provision and sustainment must be designed into life-cycle costs. Further, he discussed the radically different threat profiles across a spectrum of needs – conventional conflict, counterinsurgency, counterterrorism, and counter-proliferation. Also, Landry talked about the driving concepts of an adaptive intelligence community with the hope of providing an increasingly better integrated operational-intelligence teamwork. He noted that intelligence support for precision operations is a "Big League" mission…and it is getting more difficult and expensive with all the elements "moving" simultaneously…weapons development, targets and the conflict environment. Dr. Landry emphasized that the Intelligence Community is adapting to the needs…but said "we're going to need help" because success requires a tightly integrated team…warfighters, intelligence officers and industry.

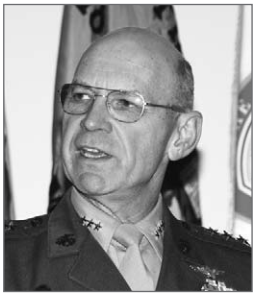
Mr. Mark Byrkit presented a presentation on the growing Information Assurance (IA) threat to Navy weapon

Mr. Mark Byrkit

systems posed by the increasing sophistication of Information Attacks. Weapon Systems, which could rely on the relative benefits of isolation, are now connected in ways that the original developers of these systems did not envision.

Further, Mr. Byrkit pointed out that malware and exploitative attacks are increasing and penetration into remote systems is now technologically feasible. The methods that these attackers pursue are varied, but attackers will increase their effectiveness through use of multiple methods to achieve their penetration and exploitation goals.

The presentation contained an overview of the information assurance for weapon systems, an overview of the IA threat and detailed threat examples, followed by a discussion of IA policy and engineering.



LtGen Duane Thiessen, USMC

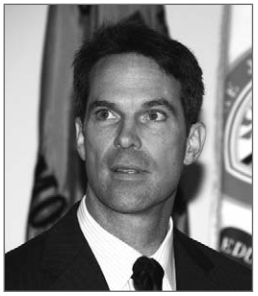
LtGen Duane Thiessen, USMC, Deputy Commandant for Programs and Resources, was the keynote speaker on Opening Day. The General kicked off his remarks by emphasizing the importance of a balanced strategy in reprogramming the Pentagon for a new age. LtGen Thiessen highly recommended that everyone in the audience read Secretary Gates' ***A Balanced Strategy*** article that was published in the JAN/FEB 09 edition of ***Foreign Affairs*** Magazine.

The General's discussion as to "why we are here at PSTS" was the thread that tied together many of the presentations given throughout PSTS-09. LtGen Thiessen captivated the crowd when he intertwined areas of instability and conflict, the adaptation of these varying battlefields and the considerations required when engaging in those particular areas. His direct interaction with the audience and combined injection of personal experience and anecdotes into the discussion truly grabbed the attention of the participants. Further, the General provided unparalleled insight regarding where we could more intently focus to better support the Defense Department's role while adapting to the challenges of current and future battlefields.

In conclusion, LtGen Thiessen noted that forums like PSTS-09 are very inspirational.

CAPT John "Snooze" Martins, USN, Director, Air Vehicle F-35 Lightning II Program Office, briefed on "Developing the JSF to Fight the War on Terror". It was insightful, complete, as well as entertaining as it presented the story of the delivery and sustainment the most advanced, affordable strike fighter aircraft to protect future generations worldwide. The explanation of the APG-81 Advanced Electronically Scanned Array (AESA) Radar, Electro Optical Targeting System Operational Capabilities, and Distributed Aperture System (DAS) offered the symposium a unique opportunity to view the enhanced capabilities for targeting the use of precision weaponry.

CAPT John Martins, USN



Greg Williams

Greg Williams, Senior Professional Staff (JHU/APL), discussed the Warplan-Warfighter Forwarder Spiral II (WWF II) System, a software upgrade to two existing systems that recently conducted successful testing in the Chief of Staff of the Air Force (CSAF)-directed Joint Expeditionary Force Experiment 2009-3 (JEFX 09-3) at Nellis AFB, NV in early April 2009.

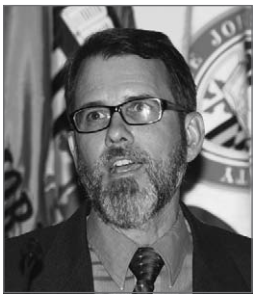
WWF II demonstrated the military value of machine to machine (M2M) interaction between the Combined Air Operations Center (CAOC), airborne Command and Control (C2) platforms, strike aircraft, and Net-Enabled Weapons (NEW) in support of dynamic targeting of stationary targets through Modeling & Simulation (M&S) and Live Fly data networks.

WWF II included software and interface upgrades to the Joint Automated Deep Operations Coordination System (JADOCS), Rapid Attack Information Dissemination Execution Relay (RAIDER) Target Package Generator (TPG) and Net Enabled Weapons Controller Interface Module (NEWCIM) systems providing an integrated CAOC the capability to exchange J-series messages with C2 aircraft, combat/strike aircraft, and NEW platforms for mission re-tasking, M2M transfer of precision target coordinates and related target data, text, imagery, engagement status, and BDA.

The benefits of the initiative were: decreased latency between C2 and weapons platforms; reduced repetitive voice communications minimizing the opportunity for error; increased real-time weapon engagement information exchange between C2 and the shooter; and the ability to update/modify NEW missions both before and after release.

The WWF II initiative as well as the JEFX 09-3 exercise were sponsored by the Global Cyberspace Integration

Center, Headquarters Air Force, Langley AFB, VA. Johns Hopkins University Applied Physics Laboratory systems engineers analyzed the data from all of the various data collectors and reported on their observations and assessment including the measures of effectiveness and performance, their major findings, and their overall recommendations.


Randel K. Langloss

Randel K. Langloss discussed the Strike Horizontal Integration Limited Objective Experiment (SHILOE), the culmination of a three-year effort to understand the multi-dimensional complexity associated with integration and interoperability of Network Enable Weapons (NEW). SHILOE, and the subsequent Empire Challenge (EC09) exercise, demonstrated an operationally realistic Network Enabled Weapons (NEW) engagement using non-NEW third-party targeting sensor sources against a variety of targets including moving vehicles. SHILOE and EC09 were conducted in a highly dynamic, real-time decision making environment using real sensors, live and synthetic targets, actual battle management systems, and a real weapons architecture (6DOF model). The session described the necessity for understanding System-of-Systems, or Horizontal Integration, within an operational context to successfully integrate NEW and achieve interoperability. The presentation highlighted the NEW technical achievement as-well-as provide insight into key lessons learned in areas of systems engineering and disparate sensor data fusion.


Lt Gen Thomas G. McInerney, USAF (Ret)

The luncheon address of **Lt Gen Thomas G. McInerney, USAF (Ret)**, Fox News Military Analyst, brought to the audience a senior spokesperson with the proposition that the words we use to define the combat situations we are engaged in presently really do matter and make a difference for the forces we employ and how we employ them in support of the Nation. Lt. General McInerney advocates that the correct name for the Global War on Terror (GWOT) should be the Global War Against Radical Islam (GWARI). He developed this premise during his presentation, supporting it with evidence from worldwide written, spoken, and broadcast media. He concluded his remarks with geographic specific recommendations for our senior government leadership.


Doug Storsved

Doug Storsved provided insight into how target defeat mechanisms should drive a miniature UAS weapon system design. He said this target-centric design process first poses the question, "What is my target set, and what is the best way to defeat it?" He discussed the relationship between the need for single-pass target defeat and the risk of collateral damage. Storsved described an approach for developing a miniature weapon design with broad mission applicability. He believes "if you don't take out the target on the first pass, your only result is collateral damage."


Col West Anderson, USAF

Col West Anderson, USAF, Chief of Staff, Eighth Air Force, brought the symposium attendees up-to-date on the "Eighth Air Force and Global Strike Command's Role in National Security Strategy."

With a background in both the B-52H and B-1B, he reviewed recent current events related to our bomber forces and presented the planned way ahead for the ones he flew as well as the unique B-2. Anderson also reviewed the future of our land based missile forces with their inclusion in the new Global Strike Command.

Following numerous reports and studies with regard to the USAF's nuclear forces (Defense Science Board, Air Force Blue Ribbon Panel, Dr. Schlesinger and Donley reports), the Secretary of the Air Force directed the creation of a new major command (MAJCOM) and directed a reorganizing of the mission and scope of Eighth Air Force. These reports all came to similar conclusions and recommendations: A credible nuclear deterrent is essential to our security; No mission is more sensitive; and the Air Force has seen a decline in nuclear focus and expertise, and must continue to strive for perfection in this mission.

This new MAJCOM, designated as AF Global Strike Command (AFGSC), will place all Intercontinental Ballistic Missiles (ICBMs) as well as nuclear-capable bombers into a single command to restore the Air Force's nuclear enterprise.

The presentation briefly covered the background leading up to this monumental decision, and then gave a brief overview of AFGSC's activation milestones, command structure, and mission.

The presentation then covered the changes occurring to the Eighth Air Force, its mission and its organization

as a result of this re-organization. The presentation illustrated how 8th Air Force and AFGSC meet the Nation's nuclear/conventional mission requirements and how their forces are presented to Combatant Commanders through several organizational structures.

In addition, the presentation described 8th AF's role as the Nation's only long-range strike command and a key expert in deterrence strategy and "operationalizing" strategic deterrence, as well as, one of the key experts for US long-range strike sustainment and modernization requirements.

Those who attended the brief gained a better understanding of why the changes were necessary and how both AFGSC and 8th Air Force are postured to assist in US National Security Strategy.

Stephen Pearcy

The next briefer **Stephen Pearcy,** (Senior Advisor, USARDEC, Picatinny Arsenal), said Precision munitions are being fielded with ever improving accuracy but, in order for them to be effective with reduced collateral damage, they must have precision targeting. In fact, if they don't have sufficiently accurate precision targeting their battlefield utility is severely jeopardized. This level of accuracy can sometimes but not always be achieved. Sometimes by mensuration techniques but these techniques cannot be used for all battlefield situations. Some devices can achieve this level of accuracy but they, so far, have been heavy power consumers with relatively long and complex calibration procedure and, not the least, expensive. Smaller, lighter, cheaper devices are required to achieve full precision targeting capability. Pearcy discussed the specific performance limitations of targeting devices and advancements in technology, which could provide much improved precision targeting capability.

John B Tuley

John B Tuley, National Geospatial-Intelligence Officer, Targeting Issues Office of Targeting & Transnational Issues, presented his assessment of "Trends In Geospatial Intelligence Supporting Precision Strike." He reviewed recent evolution of charting and geodesy and its relationship to recent increases in the use of Intelligence, Surveillance and Reconnaissance (ISR) controlled by operators in the United States to support forwarded deployed users of that ISR.

Major Ken Lemire, USA

Major Ken Lemire, USA, the Thermobaric Program Manager with the Defense Threat Reduction Agency's (DTRA) Hard Target Defeat Branch at Eglin AFB, FL, started the second day of PSTS-09 with a briefing on a Thermobaric Advanced Concept Technology Demonstration (ACTD) to develop and demonstrate an enhanced weapon system to significantly improve US Forces Korea's capability to deny, disrupt, and/or functionally defeat military activities protected in tunnel facilities.

Major Lemire stated that the ACTD achieved its objectives by leveraging emerging explosive, guidance, and warhead technology concepts in the development of the BLU-121A/B. Additionally, the ACTD assisted in enhancing the tunnel air blast module within the Integrated Munitions Effects Assessment (IMEA) planning tool to permit the user to better predict target response to an attack from a BLU-121A/B. The ACTD also resulted in numerous refinements and/or developments of the MK-84 and BLU-109, EGBU-15, BLU-121A/B, and the FMU-143 tail fuse.

Maj Lemire went on to say that upon successful completion of the primary ACTD objectives, the USAF Air Combat Command expressed interest in the ability of the BLU-121A/B to be used in a vertical penetration mode. The employment concept was to use the weapon against targets, which require more penetration capability than a MK-84, but more blast than a BLU-109.

The Thermobaric team undertook a series of trade studies to evaluate the survivability of the BLU-121A/B in a typical Joint Direct Attack Munition (JDAM) employment. The team identified minor modifications to the warhead case to increase penetration survivability (resulting in the BLU-121B/B), and began a JDAM integration effort. On 6 May 2009, this effort culminated in a successful flight test demonstration of a GBU-31(V)7 against an operationally representative, medium hardness bunker.

Peter Thompson from DTRA's Test Support Division in Albuquerque, NM, followed with a discussion on work they have been involved in concerning an AFCENT requirement for enhanced capabilities for detection and defeat of cave targets. He stated current capabilities have demonstrated weaknesses in the identification of cave targets using imagery intelligence, primarily with

Peter Thompson

regard to differentiating caves from shadows, and for sufficiently accurate characterization of slopes necessary for successful attack with current weapon systems.

In response to this requirement, DTRA received Quick Reaction Funding from OSD/DDR&E to support the development and demonstration of a small unmanned aircraft system (UAS) employing a micro air vehicle for low-altitude cave searching in rugged terrain, and for obtaining high-resolution still imagery of potential cave targets for use with digital photogrammetry software to produce highly accurate, georeferenced 3D terrain models.

The proposed UAS would be portable and operable by small teams of ground troops and employs the Applied Research Associates' "Nighthawk" and commercial off-the-shelf components to minimize development efforts. The slightly scaled-up version of the Nighthawk has been dubbed "Cavehawk" and will have active flight control, GPS waypoint navigation, and automatic "return to base" to allow recovery in the event of loss of communication with the ground control station (GCS).

Gimbaled image sensors will include video for real-time display on the ground control station that enables target search capability. A 5-10 megapixel EO still camera will be employed for collection of imagery on potential targets. Still images will be linked to the camera location and orientation using data from the Cavehawk's GPS, inertial measurement units, and gimbal system, and all data will be down linked to the ground control station.

Dr Alison Brown

Dr Alison Brown, President and Chief Executive Officer of NAVSYS Corp., was the third speaker of the morning. NAVSYS specializes in developing next generation Global Positioning System (GPS) technology, and her talk centered on work NAVSYS is doing to develop a system to generate and supply GPS ephemeris and ionospheric corrections for precision guided munitions (PGMs) for the US Army.

The Army's Program Manager for Combat Ammunition Systems contracted NAVSYS to develop a system for collecting, processing, distributing, and applying GPS ephemeris and ionospheric corrections to improve the accuracy of small PGMs. The GPS receiver within the PGM currently uses initialization data from a DAGR on the firing platform to provide satellite ephemeris and ionospheric corrections. Once in flight, this data is used by the PGM GPS receiver to acquire the satellites and then provide the PGM guidance computer with position, attitude, and velocity measurements.

Al Shaffer

The keynote address on the 2nd day was presented by **Al Shaffer,** Principal Deputy Director for Defense Research and Engineering (DDR&E). He highlighted the DDR&E strategic imperatives, including the accelerated delivery of capability to the warfighter and the importance of precision strike as we prepare for the uncertain future, by emphasizing that we must develop the right capabilities for today's and tomorrow's wars.

Precision strike, Mr. Shaffer noted, becomes very important for irregular warfare—particularly as it relates to reducing collateral damage. Further, he talked about the forces of change and focused on connecting researchers to the warfighter and the increased pace of technology development. He discussed the rise of the commons (operating in places "no one owns") and noted that the scope of the U.S. DoD science and technology program is increasing to enable development of new capabilities to operate in the commons.

Mr. Shaffer also talked about the acceleration of technology transition by emphasizing the growing numbers of countries and groups that are employing the latest and increasingly accessible technologies to achieve new capabilities that put U.S. national security at risk in disruptive and unpredictable ways.

In summing up his remarks, Mr. Shaffer homed in on the word "challenge" by asking "what can we do differently to achieve for rapid precision strike in the areas of ballistic missiles, cruise missiles, capability against moving targets, and hard target defeat?" He noted that we need more effective capabilities and that we must think about "how" to change. Mr. Shaffer suggested that we look for ways to become more agile that will improve the kill chain—including thinking about the unknowns of the future. The two big questions relating to capability gaps are—(1) in what technologies must the U.S. maintain parity or lead, and (2) where can we take risk?

Elaine Simmons

Elaine Simmons from OSD's Cost Assessment & Program Evaluation Office briefed next and focused on the fact that DoD is working very hard to ensure that the Department has enough electronic warfare capability.

Wayne Willhite, Chief Engineer, Naval Air Warfare Center, China Lake, said the integration of Networked Weapons across the DoD enterprise

requires a fundamentally different systems engineering approach if we are to realize a fully functional Sensor-C2-Weapon Tactical Network. His presentation discussed the government's role in the systems engineering problem of building a fully netted, interoperable warfighting force. The presentation was limited in scope to Networked Enabled Weapons technology, but presented the government/industry roles in the overall acquisition of highly complex weapon systems.

Wayne Willhite

Roger Gray, Principal Scientist at the NAVSEA Naval Surface Warfare Center, Dahlgren Division, Dahlgren, VA, is currently a member of the Strategic Leadership Team at Dahlgren. He leads a thrust that explores how the Navy and Dahlgren could better support Global Strike. Gray discussed the 2008 feasibility and concept exploration effort analysis work that he, and Dr. Richard Hartman (also a Principal Scientist at the NAVSEA Naval Surface Warfare Center at Dahlgren) conducted that centered on Time Critical Strike and the Prompt Global Strike Mission Needs Statements which emphasize the need for future systems to conduct conventional strike missions faster than today's systems without sacrificing current systems reach. Their analysis examined if technology being developed and demonstrated in existing ONR, DARPA, AFRL, and Industry IRAD programs could be leveraged to develop an "air breathing" vehicle that would meet both Time Critical Strike and the Prompt Global Strike needs.

Roger Gray

Rear Admiral Dave Dunaway, USN, Commander Operational Test and Evaluation Force, presented the opportunities and challenges in operational testing in tomorrow's joint environment. He talked about delivering warfighting effects. He emphasized that "you fight like you train and you build like you're organized." Further, he noted that we are not organized to procure mission capabilities. Dunaway focused on the need for precision strike weapons to become more timely and accurate. Dunaway believes that more innovative testing is required and that operational testing is absolutely necessary.

Rear Admiral Dave Dunaway, USN

ASuW Panel: John Fox, Rob McHenry, CAPT Robert Kerno USN, Unknown, CAPT Mat Winter USN, Michael Thumb, Keith Sanders, Col Mike Fantini USAF, CAPT Larry "Buck" Burt USN

One of the highlights of PSTS-09 was the **Anti-surface Warfare (ASuW) Requirements Panel** that was requested by numerous interested parties in the defense industry. This panel invited members from the U.S. Navy, U.S. Air Force and Office of the Secretary of Defense to address the requirements and acquisition strategy for the next generation ASuW weapon. The panel also included members of the Science and Technology (S&T) community in an effort to inform defense experts of their progress in this warfare area. Additionally, a representative from the Strike Land Attack Air Defense (SLAAD) division of the National Defense Industrial Association (NDIA) provided an overview of the on-going study, hosted by OPNAV N86, that focuses on the emerging threat posed by numerous nations. **LtCol Tim Farquhar USAF** from the Joint Staff's J-8 Force Application Division moderated the panel.

Michael Thumb from PMA-280 was the panel's opening briefer. He discussed network enabled weapons and time sensitive strike, focusing on ways to enhance the kill chain.

Next, **John Fox** from the Boeing Company presented the SLAAD overview of the on-going study. He highlighted the ASuW Study Group's methods and investigation focus.

Then, **Rob McHenry**, a DARPA Program Manager, presented an overview brief of the Long Range Anti-Ship Missile (LRASM) program. LRASM is a next generation anti-ship weapon capable of out-ranging current and projected surface-to-surface missile threats, enabling engagement from outside of direct counter-fire ranges. It will be capable of precision lethality with an objective for single shot kills of critical targets.

CAPT Mat Winter USN (PMA-201) next addressed the ASuW capability gap by focusing on getting solutions into warfighters' hands more quickly. Further, he discussed solution barriers. Mat also noted that

leveraging S&T investments are key to "right-sizing" capability attributes.

Keith Sanders, DD Portfolio Systems Acquisition (Air Warfare) OUSD(AT&L), closed the panel briefs by addressing OSD concerns regarding needed behavioral adjustments to the business of defense acquisition. He focused on significant changes related to the weapons system acquisition reform act by highlighting renewed emphasis on Fixed Price Type contracts and increased emphasis on technical maturity within a program phase.

Following these briefings, an ASuW Requirements Panel discussion took place that was comprised of **Mr. Sanders, CAPT Larry "Buck" Burt USN** (OPNAV N880C), **Col Mike Fantini USAF** (AF/A5RC), **CAPT Robert Kerno USN** (OPNAV N864), and **CAPT Winter**. The panel fielded questions from the audience which focused on capability gaps, requirement definitions, weapons platform integration, and acquisition reform– among others.

The representatives agreed that any ASuW Analysis of Alternatives must involve all Services, capture capability gaps across the realm of ASuW, and include air, surface and subsurface solutions. The panel emphasized the need to incorporate well defined requirements in both the Capability Development Documents (CDD) and Capability Production Documents (CPD). Effects-based requirement definitions for the Key Performance Parameters and Key System Attributes contained in CDDs and CPDs were cited as crucial to weapon program development, testing, and production.

Col Fantini, with concurrence from the panel, stressed the importance of future weapons being "joint". Joint weapons must possess the capability for integration on platforms across the Services. The representatives described the importance of ensuring that all programs are compliant with the new acquisition laws, policies, and procedures.


Dr. Ross Sanders

On the morning of the 3rd Day, **Dr. Ross Sanders**, Chief Technical Analyst for MBDA, Inc. USA, provided an exceptional presentation on an internal company effort to develop an extended range grenade. The Tactical Grenade Extended Range (TGER) employs existing mortar ammunition and combines it with an ingenious inflatable wing system to give the individual soldier in the field a capability to engage an adversary beyond normal crew service weapons ranges.

Using miniaturized optics, GPS receivers and datalink transmitters this rugged, precision weapon is lightweight and can be employed by a single warfighter. The TGER would be packaged in a small tube. Once removed and activated, the wings are inflated with an integral air reservoir, and it is ready for flight within a minute. A two-mile range and 12 minute loiter would give tactical teams a beyond small arms range lethal reach to take out sniper positions, crew served weapons or light vehicles. MBDA is continuing to refine their design and it appears to be a promising weapons capability for SOF and regular ground forces.


Dr. Christine Michienzi

In keeping with the final day's theme of precision strike for the ground forces, **Dr. Christine Michienzi** from NSWC, Indian Head, MD, provided the symposium with a promising development in the mortar ammunition field. Dr. Michienzi is the program manager for a USMC sponsored effort to extend current mortar ammunition by increasing the propellant capability. The Extended Range Mortar Ammunition rogram has found promising results with various propellants and has achieved threshold goals of extending 81 mm mortar rounds out to 120 mm round ranges. This increased range capability will allow soldiers to employ the lighter 81 mm system at increased ranges, and allow for further mortar round development to increase precision and lethality.


Dr. Ed Duff

Dr. Ed Duff, Acting Precision Engagement Product Line Leader at the Air Force Research Laboratory, Kirtland AFB, discussed directed energy weapons for airborne applications including, precision strike from large and small aircraft, airborne lasers for strategic missions and lethal self-protection against all threats.

Dr. Duff outlined progress in technology development for near-term integrated capability demonstrations that included prototype demonstrations of ground laser weapon systems, electric lasers on a large aircraft, cruise missile based HPM counter-electronics systems, and ABL theater ballistic missile defense systems. He stated that parallel investment in advanced technologies will enable even more capable demonstrations in the longer term and current planning for future LASER technology transition to Programs of Record.

The concluding highlight of PSTS-09 was the focus on **USSOCOM Day** by numerous participants from SOCOM, Hurlburt Field, Joint Staff (J-3), and China Lake.

Bill Shepherd, USSOCOM's Science Advisor, kicked off this awesome segment of the program by presenting the keynote address that focused on the Science and Technology (S&T) Overview of USSOCOM. Shepherd concentrated on various aspects of S&T that he hoped the precision strike community could help SOCOM better identify future Special Operations Forces (SOF) capability needs.

Bill Shepherd

Shepherd highlighted some of the traditional challenges faced by SOF, including the slow acquisition processes, the limited interchange between shooters and Government-Industry developers, and the lack of comprehensive oversight and coordination because the labs are not aligned to work together on SOF issues.

Regarding S&T strategy, Shepherd reached out to Government, Industry, and Academia to assist in cultivating "Intellectual Capital" and to focus on "Evolutionary" technology. He emphasized the need to synergize efforts across the Force by bringing "Best Business" practices to S&T portfolios, by employing full congressional authorities, and by "exploiting" new technologies that can be selected and inserted quickly.

Shepherd also noted that we need to provide more experiment venues for Industry to show their products and capabilities and he pointed out that we must rely on our allies to build international partner capability. Further, Shepherd identified several new and promising key technologies under development for the warfighter. Additionally, he talked about "Rapid Exploitation" as a new S&T focused initiative related to technical support to operations and cited several SOF innovative examples.

Then, the moderator of the **U.S. Special Operations Panel, LTC Hampton Hite, USA**, from the Army G8 Office, introduced the panelists.

First up was **SMSgt Eric Neilsen, USAF**, from AFSOC's Hurlburt Field office who discussed USSOCOM support to OEF/OIF. Neilsen gave an incredible account of the use of and the need for precision weapons to support OEF/OIF. Further, he talked about collateral damage concerns and emphasized the importance of designing precision munitions to reduce collateral damage. Precision enablers to find and fix are equally important and is a critical component to winning hearts and minds.

Colonel Mike Adams, USA, SOCOM's Director of Current Operations, followed and addressed Global Special Operations Support. Adams' extraordinary discussion focused on more than OEF/OIF operations and highlighted activities related to kinetic operations as well as non-kinetic operations to accomplish the U.S. objectives. What we need from the precision strike community are the "weapons" he emphasized.

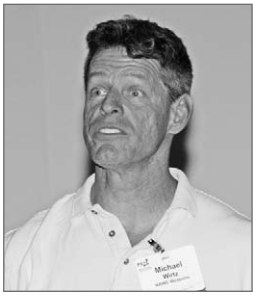
Next, **Jim "Hondo" Geurts**, SOCOM's Commander, Joint Acquisition Task Force-Dragon, highlighted precision munitions and platforms in support of irregular warfare. Geurts stressed the necessity to deliver the capability to the user expeditiously. His valuable comments focused on the need to build the next best weapons that will give him the best edge. He underscored the importance of keeping the warfighters involved throughout the process as well as taking risk and managing it properly. Geurts stated that SOF must follow the same procurement requirements as the conventional force, and he noted that SOF allocates resources to what SOF forces require—conventional forces must do the same. Further, Geurts emphasized the desire to be creative to enable more rapid modification, integration, test and fielding.

U.S. Special Operations Panel: LTC Hampton Hite, USA, Jim "Hondo" Geurts, SMSgt Eric Neilsen, USAF, Colonel Mike Adams, USA, Christopher L. Fettes, Seal Team 10, Andrew B. Walter, Seal Team 10, Colonel Rick Samuels, USAF and Blair C. Fackler, Seal Team 10.

Colonel Rick Samuels, USAF, the Joint Staff's J-37 Division Chief for Plans, Policy & Exercises, Office of DD Special Operations & Combating Terrorism, followed by discussing the critical strategic authorities and approval process. Samuels talked about some of the sensitive activities of the approval process and highlighted the importance of having JTAC at every element. His remarks were of high interest to the precision strike community.

Lt Col Mark Clawson USAF

CDR David "Manny" Ramsey, USN



Michael Wirtz

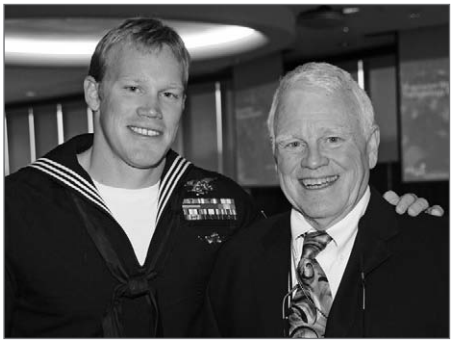
Lt Col Mark Clawson USAF, Assistant Operations Officer, 4th Special Operations Squadron, Hurlburt Field, then delivered a fascinating discussion of AC-130U gunship engagements in support of OEF. Clawson provided very interesting highlights of gunship effects through use of video as well as detailed descriptions of activities in support of OEF.

The two gifted speakers who closed out the session were **CDR David "Manny" Ramsey, USN**, Fires Support Officer, Joint Terminal Attack Controller, Naval Special Warfare Development Group, and **Michael Wirtz**, Digital Precision Suite PM, Naval Air Warfare Center, Weapons Division, China Lake. Ramsey focused on the third party targeting of TLAM and Wirtz briefed the Digital Precision Strike Suite. Wirtz highlighted the various aspects of precision tactical targeting activities in OEF and OIF.

The PSTS-09 US Special Operations Panel included three members of SEAL Team 10 who just returned from deployment. All three SEALs are qualified Joint Tactical Air Controllers and have used precision weapons in combat in Iraq and Afghanistan. The SEALs answered questions during the U.S. Special Operations Panel and during Symposium breaks.

At the conclusion of the Special Operations Panel, Hampton Hite captured the panelists' remarks by making the following three points: (1) It is imperative that all our procurement processes buy only what we need and that resources support equipment critical to the warfighter. SOF must follow the same procurement requirements as the conventional force. SOF allocates resources to what SOF forces require—conventional forces must do the same; (2) Training our forces in basic fundamentals remains essential, regardless of technological advances. We must prioritize training for individual warfighting skills. Technological advances are a multiplier—not a replacement; and (3) Laser designators—and all hand-carried equipment for that matter—must be designed to fit into the ground warfighters load bearing equipment. This requirement is more important than the actual weight of a system.

In summary, PSTS-09 was credited by many as being the "best symposium they had attended in a long time." So, the precision strike community is very proud of this great honor and will attempt to meet the same level of expectation for PSTS-10 scheduled for October 26-27, 2010. ■



Two generations attend PSTS: Andrew and John Walter

Lt Gen Thiessen, USMC with PSA Board Members: Ken Britt, Andy McHugh, Ginny Sniegon, John Walter, George McVeigh and Harvey Dalhjelm

PSA would like to thank the following Corporations for Sponsoring PSTS-09

Honeywell Int'l
Kaman Precision Products
Lockheed Martin
Northrop Grumman
Raytheon Company
The Boeing Company

"Thoughts From Annapolis"

MIDN 2/C Michael S. Smithson

As an aerospace engineer, it was my hope that I could understand some of the work being done by the engineers at the PSTS-09. Unfortunately, it quickly became apparent that I was out of my league from both a technical and product marketing point of view. However, I have come to realize that these proficiencies were not necessary in order to benefit from this symposium. Instead, I realized that I represented an equally important member of this puzzle of product procurement. I represented the future employer of these weapons and technologies, and thus have gained a unique and hopefully fresh perspective on the technologies that are being promised to future American fighting forces.

The most interesting movement I saw at the symposium was an effort to make current systems less complicated. One specific effort was replacing exploding bolts on weapon mounts under wings with compressed air containers that can be recharged during flight. In a sense, they were simplifying and perfecting existing systems with the intent of making maintenance easier and less expensive. To add onto this, the spirit of simplifying processes and reducing maintenance costs was very prevalent in the JSF program. With my EA303 Wind Tunnels professor being RADM Steidle, a current consultant and prior manager of the program, it was intriguing to see the overall effort of the program to integrate technology while maintaining simplicity in the systems. Specifically, I appreciated the efforts being made to make the interface as simple as possible for the pilot. Yes, it is nice to have extensive capabilities; however, since I, as well as other pilots, am not a professional engineer in my spare time, I certainly appreciate the efforts being made to give American pilots a technological advantage while not exhausting the capabilities of the human component of the system.

Overall, the symposium was valuable exposure to the industry that I could potentially be a part of in the future. It was also appreciated being able to put faces and names with the brand names that supply many of the systems and technologies that we as the military deal with on a daily basis. In short, it was an eye opening and intellectually fascinating experience. ■

The submissions above are the author's opinion and not that of the Navy or USNA.

MIDN 2/C Cray R. Pack

In my opinion, the most interesting concept introduced at the symposium was CAPT Shepherd's idea of capitalizing on the innovative ideas of our enlisted in the field. The idea of allowing marines, sailors, and soldiers to present their ideas to contractors, while operating in the field, would greatly improve the military's ability to provide timely solutions to immediate problems. The experience and perspective of our enlisted personnel serving on the front lines oftentimes makes them more qualified to solve problems than engineers who are unfamiliar with the tools that our enlisted have at their disposal.

Another lucrative innovation presented at the symposium involved increasing the range of the 81mm mortar. By increasing the range of the 81mm, marines would have the capability of engaging more distant targets without having to carry the load of a larger, heavier mortar. I was particularly interested in learning about how the engineers were planning to improve the range of the mortar without adversely affecting the integrity of the barrel.

As if UAVs taking over the role of pilots wasn't scary enough, now grenades could get fired and replaced with a UAV replicate. I thought that the TGER design would be very useful for eliminating targets outside of the range of a hand grenade. The inflatable wings make it very portable for ground units. It could be a very useful tool for marines and soldiers if they do not have immediate access to mortars or air support. ■

More than 50 Midshipmen from the U.S. Naval Academy, pictured above with DDR&E's Al Shaffer participated in PSTS-09. These students from the Weapons Engineering Department were thrilled to be part of PSTS-09 and especially enjoyed learning about the complexities of the precision engagement environment. They found this experience to be very beneficial to their hands-on training.

The Boeing Co.

Critical Response Manufacturing, Inc. (CRM)

Marotta Controls

MBDA Missile Systems

SENSIAC

Ultra Electronics

Richard H. Johnson Award Presented at PSTS-09

Steve Roemerman, Andy McHugh, Alice Johnson & Ira Johnson receiving the Richard Johns Award.

"It started with his passion for aviation and gliders in particular, which he pursued at an early age, first with model airplanes and then building his own gliders and teaching himself to fly…" Ira Johnson, son of Richard Johnson, began his meaningful portrayal of his father's life.

Before World War II, Richard H. "Dick" Johnson built gliders, won competitions and started a flying career. Piloting and building flying machines were passions that he sustained for 70 years. He won his first competition in California at the age of 14 by building a hand-tossed model aircraft and went on to win 11 national soaring contests. He set and broke his own records, sometimes in the same week. He also had an aeronautical engineering career that included pioneering work on guided missile systems.

He was responsible for the aerodynamic design of more than 65% of the guided weapons used in Desert Storm, and his designs made a number of other important contributions to our free society for nearly 50 years. His contributions benefited all branches of the U.S. military, and were used by every major American prime contractor. They have been imitated by nearly every foreign maker of guided weapons. It was the design of precision guided weapons that gave him the chance to make his most unique contributions. He was the designer of a number of precision guided weapon airframes, including the entire U..S. Laser Guided Bomb inventory (more than a dozen types), HARM, JSOW, Javelin, Excalibur, and others.

Dick Johnson was known as a quiet, gracious person who mentored others. He made his contributions as an individual member of a team, never aspiring to a management role and represented what an individual can contribute to our nation's defense.

It was this attribute that attracted PSA to honor Dick Johnson and other individual technical achievers. PSA was honored to present Dick's wife, Alice and son, Ira the first annual Richard H. Johnson Technical Achievement Award at PSTS-09. We look forward to future nominations and presenting this award to other worthy achievers. Please visit our website for more information on Richard Johnson and the nomination process. ■

Sniper ATP to Receive the 14th Annual Perry Award

It is our great pleasure to announce that the William J. Perry Award nomination committee has selected the Lockheed Martin Sniper Advanced Targeting Pod (ATP) as the 14th annual Perry Award winner.

The Sniper ATP and the US Air Force has significantly impacted combat operations by reducing aircrew workload and shortening the kill chain timeline to engage enemy insurgents while helping avoid fratricide and preventing harm to non-combatants.

U.S. and coalition forces rely heavily on the Sniper pod in Iraq and Afghanistan to identify insurgent activity such as the placement of improvised explosive devices (IEDs)—saving countless lives.

Another key attribute of the Sniper pod is its proven ability to provide weapons-quality track of surface moving targets, utilizing new weapon variants as well as bringing new capability to legacy weapons.

Congratulations to Lockheed Martin, US Air Force and the well-deserved Sniper ATP team for receiving the 2010 William J. Perry Award. This award will be presented at the Precision Strike Winter Roundtable luncheon on February 10, 2010 ■

"I Won't Forget Them As Long As I Live."

Bagram Airfield, Afghanistan—Those are the words of Capt. Gordon Olde, an F-15E Strike Eagle weapon system officer, following a battle at a remote military base about 10 miles from Pakistan that erupted on the morning of Oct. 3 and highlighted the unbreakable bond between airmen and soldiers.

In a steep valley in the Nuristan Province in Northeast Afghanistan, combat outposts Keating and Fritsche were attacked by hundreds of militants from multiple firing positions. Within minutes, USAF tactical aircraft were on scene and engaging the enemy, said Army 1st Lt. Cason Shrode, COP Keating's fires support officer.

"We received a heavy volley of fire," Shrode said referring to the initial wave of enemy foces. However, "we had so many different assets up in the air ... they were stacked on so many different levels ... we had everything we needed."

An F-15E Strike Eagle, like the one pictured here and a B-1B Lancer, similar to the one above battled insurgents at combat outposts Keating and Fritsche, where nearly 100 militants were killed by the combined response that included Afghan soldiers as well as U.S. air and ground units Oct. 3, 2009.

Srode, working from his secondary tactical operations center because his primary location was on fire from the attack, was in contact with Senior Airman Angel Montes, a joint terminal attack controller (JTAC), and Airman 1st Class Stephen Kellams, serving as a radio operator maintenance and driver, or ROMAD for short. Both airmen were at a forward operating base about 20 miles away.

With buildings already on fire, a formation of two F-15Es rolled in overhead and immediately saw the enemy.

"They were on the surrounding ridges," said Olde, flying over the area and referring to the combat outpost surrounded by steep mountain peaks on three sides. "A major attack was apparent to us from the moment we showed up. I knew something big was unfolding before our eyes; all I could think about were the guys on the ground."

The first F-15Es on the scene were helmed by F-15E pilot Capt. Isaac Bell and Olde, as well as Capt. Dave Nierenberg, another Strike Eagle pilot, and British Flight Lt. James Siwicki, a weapon system officer. All aircrew were part of the 335th Expeditionary Fighter Squadron deployed from Seymour Johnson AFB, NC.

Capt. Mike Polidor and 1st Lt. Aaron Dove arrived later over the combat outpost and assumed the roles of tactical air controller.

"That's something we don't often train for, but they executed it perfectly by funneling all the JTAC's information to the other jets that showed up," Olde said. "They did an incredible job and no-doubt saved numerous lives on the ground due to their organized and methodical employment of airpower."

Communication on the ground was scarce initially due to the very harsh terrain, according to the F-15E aircrew. However, they quickly developed a way around this by splitting up their typical two-ship formation and placed one aircraft over a nearby forward operating base some 20 miles away. At this forward operating base, the JTAC teams were linked to Shrode, the fires support officer via F-15E aircraft.

"We were able to get comms with AH-64 Apache gunships supporting Keating and we relayed for them to the JTAC that (insurgents) were inside the wire," said Olde.

After a successful bomb run, Bell and Olde went back in with their cannon and employed a "single strafe pass, then had to head back to refuel," Olde said, handing the fight over to fellow squadron members.

"I cued the Sniper pod to the burning COP and it hit me how serious things were," said Dove. He and Polidor set themselves over the nearby forward operating base acting as a radio relay and coordinated air strikes of a B-1B Lancer bomber and F-15Es all while coordinating between two bases and Army Apache helicopters with a thunderstorm rapidly approaching.

"We coordinated and relayed many air strikes with various aircraft," Dove said. "By the time we got home, we had been airborne for eight hours, strafed mountainous terrain in dangerous weather, and integrated more than 30 bombs on targets around Keating; none of which caused any friendly injuries or fatalities or civilian casualties."

"My hat goes off to those Americans on the ground who fought so bravely, especially those who gave their lives serving their country," Olde said.. ■

Missile Retrofit Provides Better Accuracy

Members of the 86th Munitions Squadron at Ramstein AB, Germany, recently upgraded their AGM-65 Maverick H-and-K-model missile systems as part of an Air Force effort to modernize its weapons inventories.

With the help of an Air Force Reserve ammunition team and a Maverick Systems Program Office team from Raytheon Missile Systems, the project was completed in 10 days last August.

The project enhanced the effectiveness of more than 70 missiles by replacing the software circuit card in the guidance control section.

"Raytheon did an analysis on their software along with some live fire test at Hill AFB, Utah," said Tech. Sgt. Michael Montaldo, 86th MUNS conventional maintenance section assistant NCOIC. "They were hitting at about 83 percent, which wasn't good enough. They wanted to get closer to 100 percent. They undertook a tracker study over the course of three years and determined that if they upgraded the software card into the existing stockpile, it would increase the missiles' accuracy."

USAF Master Sgt. Eugene Rinaldi removes the guidance control section of an AGM-65 Maverick missile system for upgrades at Ramstein AB, Germany.

A member of the 86th Munitions Squadron removes the guidance control section of an AGM-65 Maverick missile system for upgrades at Ramstein AB, Germany. By July 2011, more than 2,000 AGM-65 Maverick H and K models will have been updated.

Before the upgrading process, or retrofit, could begin, airmen from the 86th MUNS had to prepare their workstations to create a controlled atmosphere while handling the missiles.

"We had to set up one of our maintenance bays for a clean air environment where the Raytheon SPO team set up a specialized tent in case humidity was too high," Montaldo said.

The airman pulled them out of storage, filtered them through the work area and put them back into storage. Each missile weighed either 466 or 654 pounds, depending on the model.

In order to complete this upgrade, the five-person Air Force Reserve ammunition team and 12 86th MUNS airmen removed the guidance control section of the missile, and positioned it in the clean room. There the five-person Raytheon SPO team upgraded the card and tested the section to make sure the circuitry was installed correctly.

Not only does the upgrade allow for increased accuracy, but also the new software card now gives the pilot an in-flight abort option.

"The pilots will now have a fail-safe, so they can, at the last minute, hit abort and the missile will veer off," said Staff Sgt. Nicholas Dillenbeck, 86th MUNS conventional maintenance element crew chief. According to Montaldo, the better accuracy and abort option also helps control the amount of collateral damage caused.

And, upgrade of the missiles also has an added monetary benefit. "Other than the increased reliability of the assets, the Air Force will save $42.8 million by upgrading their existing stockpile," Montaldo said. "They won't have to pay for more new missiles or the shipping costs involved."

The AGM-65 Maverick is used on fighter aircraft for the Air Force, Navy and Marine Corps, the AGM-65 Maverick H and K models use a camera to track their targets, sending a picture of what it sees back to the pilot. Once the pilot identifies and selects a target and the missile locks on, the pilot will release the missile to seek its designated target.

"This missile (the H model) is a blast-fragment missile. It's designed for taking out personnel on the ground; things like that," said Tech. Sgt. Benjamin Fiske, an Air Force Reserve ammunition team munitions inspector. "The K model is a penetrator missile. It's designed for taking out things like heavy armored tanks. It will punch a softball-sized hole through several inches of armor plating and pretty much incinerate anything inside."

Ramstein AB was the fourth base to participate in the retrofit program so far. By July 2011, more than 2,000 AGM-65 Maverick H and K models will have been updated across the Air Force. ■

News Briefs

Sniper ATP Continues Successful B-52 Integration

Lockheed Martin recently completed Phase 2 of its Sniper Advanced Targeting Pod (ATP) B-52 integration program at Barksdale AFB, LA. Sniper pod integration on the B-52 will provide aircrews with critical long-range, positive target identification and video downlink capability to forward-deployed forces for non-traditional intelligence, surveillance and reconnaissance.

In the latest series of flights, Sniper ATP demonstrated its ability to operate on the B-52, proving its extended laser range capability, precision long-range target tracking and moving multi-target track.

The Sniper pod is operational on USAF, ANG and multinational F-16, F-15, B-1, F-18, Harrier, A-10 and Tornado aircraft. Its common software and hardware interface design enables users to "plug and play" across services and multiple platforms, providing greater interoperability. Deployed in theater since January 2005, Sniper ATP has been selected by 12 international air forces and coalition partners.. ■

Advanced Bunker Buster in Development

The Defense Department is developing an advanced "bunker-buster" bomb that should be ready for deployment soon.

The Pentagon is developing a massive penetrator bomb designed to pulverize underground facilities that may store weapons of mass destruction and related systems.

At a hefty 30,000 pounds, the new penetrator bomb weighs almost four tons more than the U.S. military's former heavyweight champion, the nearly 22,000-pound massive ordnance air blast conventional bomb, known by the acronym MOAB. The massive penetrator bomb will be in a class by itself and represents a unique capability. ■

Future Weapons: Adaptable and Less Costly

Future U.S. military weapons are going to have to be relevant, adaptable and affordable, the nation's second highest-ranking military officer told defense contractors recently.

Gone are the days of spending millions of dollars on technology and equipment that is all but obsolete by the time it is fielded to troops, said Marine Gen. James E. Cartwright, the vice chairman of the Joint Chiefs of Staff.

And no longer can the United States afford to cut out large chunks of its defense budget for weapons systems that provide only a niche capability, he said.

The prolonged wars in Iraq and Afghanistan have fundamentally changed the construct of the force that for decades was built on the idea of having to fight two large enemies at the same time.. ■

Cobham Demos New Bomb Rack

Cobham has successfully demonstrated a new, cleaner, reusable technology capable of ejecting light stores from bomb racks. The Cold Gas Cartridge was successfully demonstrated at the Overberg Test Centre in South Africa in November.

The Cold Gas Cartridge was fitted to Cobham's Carrier Bomb Light Stores (CBLS) on a South African Air Force Hawk light attack jet. Four 12.5kg practice stores were released from the aircraft flying at a speed of 450 knots in both level and dive flight profiles.

The Cold Gas Cartridge has been designed to be reusable and will achieve the equivalent performance of traditional single-shot pyrotechnic cartridges. The system is "inherently clean" because without pyrotechnics to eject the stores, acidic debris does not accumulate, thus reducing the need for launcher maintenance and associated spares consumption.

This has the advantage of significantly reducing the lifecycle cost of the system. Added benefits of the Cold Gas Cartridge include simplified logistics support in comparison with pyrotechnics.

Installation of the Cold Gas Cartridge into an ejector release unit is a simple and quick process requiring no modification to the aircraft whilst offering weight and space saving compared to compressor and accumulator systems.. ■

CALENDAR OF EVENTS

Precision Strike Winter Roundtable
Date: February 10, 2010
Theme: *Strategic Challenges for Precision Engagement*
Location: Marriott Crystal Gateway Arlington, VA

Precision Strike Annual Review
Date: April 20-21, 2010
Theme: *Iron Discipline in Acquisition to meet Precision Engagement Requirements*
Location: Waterford at Springfield

Precision Strike Technology Symposium (PSTS-10) SECRET/NOFORN
Date: October 26-27, 2010
Location: Johns Hopkins University Applied Physics Laboratory, Kossiakoff Center, Laurel, MD

Sponsorships and exhibition opportunities available for all events. For more information email info@precisionstrike.org or visit our website: www.precisionstrike.org

Army Tests New Mortar System

Fort Benning's Maneuver Battle Lab is part of the effort to decrease the weight soldiers carry on missions.

Soldiers recently evaluated a lightweight base plate being developed for the M224 Lightweight Company Mortar System during a series of live-fire, static and movement exercises at McKenna Urban Operations Complex, Fergusson and Buckner ranges.

The current M8 base plate limits the direction and distance a mortar can be fired and soldiers still have to carry the M7 base plate — weighing more than 14 pounds — in order to fire in any direction and at maximum range.

The new base plate will reduce the need to carry both during offensive operations when there may be a need to fire beyond hand-held range. It can support firing at maximum range, which could eliminate the need to carry the M7 base plate, significantly decreasing the weight of the soldiers' total equipment load.

Factoring in the cannon and bipod, the current 60mm M224 mortar system weighs 46 pounds. The M8 X is 4.8 pounds, so the goal is to get the entire package down to about 33 pounds. ■

LM Delivers First F-35 E-O Targeting System

Lockheed Martin has marked successful entry into low rate initial production on the F-35 Lightning II Electro-Optical Targeting System (EOTS). The first production units have been delivered to Lockheed Martin Aeronautics in Fort Worth, TX, for integration onto the aircraft.

Embedded into the F-35's fuselage with an innovative faceted sapphire window, the low-drag, stealthy EOTS is the world's first and only sensor combining forward-looking infrared and infrared search and track functionality. The F-35 EOTS will provide Lightning II pilots with significant air-to-air and air-to-ground situational awareness in a single compact and completely passive sensor.

The F-35 EOTS production is ramping up to produce up to 200 units a year. The latest generation infrared sensor technology, the F-35 EOTS builds upon the success of Lockheed Martin's Sniper Advanced Targeting Pod. ■

TALON/OH-58D Demo

The U.S. Army recently fired two TALON Laser-Guided Rocket guided test vehicle rounds during an Aviation Multi-Platform Munition Demonstration.

TALON LGR is a cooperative development effort between Raytheon and Emirates Advanced Investments of the United Arab Emirates.

The TALON LGR rounds were launched from a U.S. Army OH-58D Kiowa Warrior and hit targets at 2.17 miles. This exceeded accuracy requirements for the Department of Defense's Advanced Precision Kill Weapon System II program.

The TALON LGR is a low-cost, semi-active laser guidance and control kit that connects directly to the front of the legacy 2.75-inch unguided rockets fired from the OH-58D Kiowa Warrior. It requires no software or hardware modifications to the launcher or aircraft platform and can be fired from any aircraft that fires 2.75-inch unguided rockets. ■

PSTS-09, Continued from page 1

the future of precision strike. Other speakers will address wide-ranging challenges and activities of paramount interest to the precision strike community.

A special feature of our Winter Roundtable each year is the pride we enjoy in presenting the William J. Perry Award to a very deserving individual or team of experts who have made significant contributions to the development and support of precision strike systems that have led to the strengthening of our vital national security interests.

The recipient of this prestigious award for Winter Roundtable 2010 is the Lockheed Martin Sniper Advanced Targeting Pod Team and the US Air Force. Sniper's advanced targeting technology and features are changing the way our armed forces operate in theater.

Please join our distinguished leadership speakers as they highlight key national security challenges facing our great nation.

Lockheed Martin Sniper Advanced Targeting Pod

Review page 19 of this *Precision Strike Digest* for a snapshot of major topics to be addressed during WRT-10. Also, please note briefing topics already confirmed for our April 20-21, 2010 **Precision Strike Annual Review (PSAR-10)** that will take place at The Waterford in Springfield, VA. ■

Schedule at a Glance

WINTER ROUNDTABLE 2010

10 FEBRUARY 2010

CRYSTAL GATEWAY MARRIOTT — ARLINGTON, VA

Strategic Challenges for Precision Engagement

Roundtable Highlights

Quadrennial Defense Review (QDR-10)
Congressional Perspectives
The Strategic Environment
National Security Reform—Implications for Precision Strike
Congressional Staff Members Priorities & Issues Panel
Joint Strategy Review & National Military Strategy
William J. Perry Award Ceremony
Cost-Effective Weapons
Maritime Strategy & Carrier Aviation
Strike & Targeting Challenges in CENTCOM's AOR
USAFRICOM's Engagement Strategy

ANNUAL REVIEW 2010

20-21 APRIL 2010

THE WATERFORD — SPRINGFIELD, VA

Iron Discipline in Acquisition to meet Precision Engagement Requirements

Review Highlights

Precision Weapons Requirements
Fulfillment of Urgent Operational Needs
Connecting Current Capabilities to Future Concepts
Services Technical Sessions—Precision Strike Weapons Systems
International Programs Session
Accelerating Acquisition—USSOCOM's Perspective
Army's Modernization Program
Precision Strike Test Challenges Panel
ISR in Weapons Systems Acquisition
Combating WMD Across the Kill Chain
Vast Logistics Network to Support Afghanistan Surge
Advanced Precision Weaponry
Conventional Weapons S&T Joint Assessment Team Process
Precision Fires

IN THE NEXT ISSUE

Wrapup on Winter Roundtable 2010

PRECISION STRIKE ASSOCIATION CORPORATE MEMBERS

GOLD

Aerojet
Alliant Techsystems
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Barr Associates, Inc.
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Textron Inc.
The Boeing Company
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SILVER

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Decisive Management Professionals International, LLC
Lonestar Aerospace
Marotta Controls, Inc.
Software Engineering Associates, Inc.
Ultra Electronics

Membership Application – Precision Strike Association

I hearby apply for membership in the Precision Strike Association. My understanding is this entitles me to invitations to appropriate Association activities, the quarterly newsletter and other benefits.

Corporate Membership

❏ Gold Sponsor $750 annual dues (annual sales in excess of $10M): includes 20 individual memberships
Include $10 for each individual membership requiring mailing outside of North America.

❏ Silver Sponsor $300 annual dues (annual sales less than $10M): includes 10 individual memberships
Include $10 for each individual membership requiring mailing outside of North America.

❏ Bronze Sponsor $100 annual dues (only available to Gold Sponsor members). This allows operating units, field offices, or divisions of large corporations to add 5 additional members to their list. There is no limit on Bronze sponsorships.
Include $10 for each individual membership requiring mailing outside of North America.

Individual Membership

❏ One Year $40 ❏ Two Years $75 *Include $10 for each individual membership requiring mailing outside of North America.*

❏ Government Membership: Free 3-year

Name _____ Affiliation _____

Address _____

City, _____ State, _____ Zip Code _____

Telephone _____ Fax _____ E-mail _____

Is this a renewal ❏ or a new membership ❏ ?

Payment: ❏ Check (Payable to Precision Strike Association)
❏ Visa ❏ M/C ❏ Amex

Card # _____ Exp. Date _____

Signature _____ Date _____

Please Mail to:
Precision Strike Association
2111 Wilson Blvd - Suite 400
Arlington, VA 22201-3061
703-247-2590 / Fax 703-527-5094
E-mail: info@precisionstrike.org
Website: www.precisionstrike.org

PRECISION STRIKE ASSOCIATION
Affiliate, National Defense Industrial Association

Precision Strike Association
2111 Wilson Blvd - Suite 400
Arlington, VA 22201-3061

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