



**PRECISION STRIKE
ASSOCIATION**
Affiliate, National Defense
Industrial Association

4th Quarter
2010
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"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."

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.

Precision Strike Annual Review at Ft. Walton Beach, FL

As our Administration continues to review its strategy in Afghanistan, economic stressors further complicate procurement of critical weapons systems. Requirements for precision engagement systems must be balanced to better align with budget constraints and operational needs based on priorities assigned to warfighter capabilities. Senior leaders from all Services are seeking efficiencies in the current fiscal environment while faced with the prospect of additional diminishing resources.

The Precision Strike Annual Review (PSAR-11) will be conducted on February 23-24, 2011 at the Emerald Coast Conference Center located near Eglin AFB. The co-hosts are USAF Major General Charles Davis, Commander, Air Armament Center and Air Force Program Executive Officer for Weapons, and Dr. John Wilcox, Associate Director for Weapons, Air Force Research Laboratory. The theme **Precision Strike with Coalition Partners** offers the precision strike community a unique opportunity to witness a vast and diverse group of coalition partners



Major General Michael Snodgrass, USAF



Major General Charles Davis, USAF



Dr. John Wilcox

discussing their precision strike needs.

Representatives from four of our Combatant Commands—PACOM, CENTCOM, SOUTHCOM and EUCOM—have been invited to chair precision strike coalition partner sessions. Further, PSAR-11 will showcase topics ranging from Shared Interests/Shared Responsibilities with Coalition Partners and Weapons Science and Technology Investment Areas to International Perspectives from the Services Program Offices.

USAF Major General Michael Snodgrass, Assistant Deputy Under Secretary of the Air Force for International Affairs, will keynote the two-day event on the opening day. The General will share his vision on coalition policy, cooperation and operations along with challenges regarding security and stability in various regions of the world. He will focus on

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Chairman's Column

I hope you were able to attend the Precision Strike Technology Symposium (PSTS-10) at the

JHU/APL Kossiakoff Center in Laurel, MD. PSA once again put together a very dynamic and powerful classified program.

The incredible lineup included: keynote speakers USAF Lt Gen Chris Miller, Air Force Deputy Chief of Staff for Strategic Plans & Programs and USN RADM Kurt Tidd, the Joint Staff's Vice Director for Operations (J-3); and, special presenters USN VADM Barry McCullough, Commander, U.S. Fleet Cyber Command/Commander, U.S. 10th Fleet and U.S. Army LTG John Mulholland, Commanding General, US Army Special Operations Command, who kept the symposium focused on USCENTCOM's needs in Afghanistan.

Panels on Afghan operations, Precision Strike Investments to meet USCENTCOM's current and future needs and the Nuclear Future kept the participants captivated and engaged. Another high point was the second annual presentation of the Richard H. Johnson Award. Acknowledging the accomplishments of those previously unheralded, the PSA annually bestows 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 year's award was presented to Robert J. Whalen, President and CEO of Decision Sciences, for his significant engineering accomplishments and outstanding mentorship of young engineers. Speaking of the younger crowd, once again we had the pleasure of hosting USNA midshipmen (pictured on page 8) visiting the Marotta display (many thanks to Tom Marotta for his continued support of PSA).

Cold weather has descended upon us with little warmth to be found in the world of Continuing Resolutions. We are

in the second quarter of the fiscal year languishing in the uncertainty of what is to follow in FY 2012. Defense Secretary Robert M. Gates gave us some idea of what lies ahead, but his announcement is surely not the end of it.


In an effort to defeat the cold and the memories of last year's record snowfall, we are conducting our Precision Strike Annual Review (PSAR) in Ft. Walton Beach, FL on Feb. 23-24. PSAR-11 will bring you more than 16 Coalition Partners who have been invited to address their top precision strike priorities and budgetary limitations.

In addition to Air Armament Center and Air Force Research Lab perspectives, the event will offer insights on: International Cooperation; Shared Interests/Shared Responsibilities with Coalition Partners; Acquisition at the Tip of the Spear — USSOCOM Perspective; Navy International Program Office Perspective; and, the U.S. Army Security Assistance Command Perspective.

There are many questions surrounding current U.S. and international defense requirements and budget constraints and PSAR-11 will provide an excellent opportunity to get the most up-to-date information that you can apply to your strategic business plan.

PSAR-11 will also highlight a major achievement for the precision strike community with the 15th presentation of the William J. Perry Award, recognizing 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 2010 Wrapup

The Precision Strike Association (PSA) held its 20th Annual Precision Strike Technology Symposium (PSTS-10) October 27-28, 2010, 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 Walter, George McVeigh and Harvey Dahljelm tri-chaired this very successful two-day SECRET/NOFORN symposium with the theme *Precision Strike Technology Improvements for Meeting USCENTCOM's Needs in Afghanistan*.

PSTS-10 focused on the large-scale, high priority security force assistance operations that are ongoing in Iraq and Afghanistan, considering the precision strike technological improvements to advance the ability to get needed capability to battlefield commanders now and in the future. PSTS-10 also included three hot-topic panels—*Precision Strike Operations in Afghanistan*, *Precision Strike Investments and the Nuclear Future*.

Dr. Ralph D. Semmel, JHU/APL Director, welcomed the PSTS-10 attendees to the 20th PSTS hosted at the Applied Physics Laboratory. He talked about Joint Vision 2010. He asked and reflected on what has been done relative to the development and implementation of Network-Centric Operations, which our warfighting abilities have leveraged and now depend for timely and accurate information for mission success.



Dr. Ralph D. Semmel

However, Dr. Semmel noted, that our Information Superiority is being greatly compromised by our lack of information assurance on our networks and our weapon systems. While our warfighting networks have become a key enabler, they also pose a serious point of failure, and he provided the view that Precision Strike Capabilities can advance, but today's and future mission success requires us to regain technological information superiority.

Rear Admiral Kurt Tidd, USN, Vice Director for Operations (J-3) on the Joint Staff, delivered the opening keynote address. In keeping with the symposium's theme, Admiral Tidd presented a dynamic



Rear Admiral Kurt W. Tidd, USN

presentation on the challenges for meeting USCENTCOM's needs in Afghanistan by focusing on precision strike kill chain concerns and technology improvements. He addressed critical impacts of Improvised Explosive Devices (IEDs) and talked about generic and actual enemy networks. In his closing remarks, Admiral Tidd emphasized the need to eliminate collateral damage to remain effective.

Vice Admiral Bernard J. McCullough, USN, Commander, U.S. Fleet Cyber Command/Commander, U.S. 10th Fleet, talked about Operationalizing Cyber as being a real golden opportunity.

He focused on the nature of the cyber threat and provided detailed examples of recent cyber attacks. He reflected on what is required to succeed in the cyber domain and the U.S. Fleet Cyber Command's leadership role. Admiral McCullough noted that the new Command was set up on May 24, 2010. Further, he described the new Joint Command and Control relationships and the way ahead for Department of Defense Global Information Grid Operations.

Glenn Perryman, the Navy's Deputy Program Executive Officer for Strike Weapons, (PEO(U&W)), provided a thorough and engaging account of important major strike weapons programs as well as linking their use and importance to current operations and the future of strike weapons in support of the Kill Chain.

Danny Price, Director, Spectrum & Communications Policy Directorate, OASD(NII), addressed the issue of Electromagnetic Spectrum and Precision Strike. He noted that EMS access is critical to all DoD operations – a limited resource with increasingly high demand. He focused on the challenges of standoff precision weapons and noted that targeting is increasingly spectrum dependent. Price further noted that military spectrum requirements are growing. Operations in Afghanistan require much more



Vice Admiral Bernard J. "Barry" McCullough, III, USN



Glenn Perryman



Danny Price

bandwidth than the Gulf War. Unmanned Aerial Systems (UAS) have increased dramatically since the year 2000. Regarding the current situation, Price stated that opportunities for economic growth are forcing U.S and other nations to make spectrum available for wireless growth.

Lieutenant General John F. Mulholland, Jr., USA, Commanding General, US Army Special Operations Command, made considerable effort to pulse his Operation Enduring Freedom (OEF) operators as to what they would need to improve operational success in the OEF fight. That request for information was also fully coordinated with Joint Special Operations Command (JSOC). He shared a number of classified needs, along with the plea (recurring throughout all presentations) for lighter weight, more energy dense devices to be carried (in this case by his Ranger and Special Forces elements). He specifically focused the audience on his concern for the continuing need for area saturation weapons as well as on small precision weaponry for tactical use.



Lieutenant General John Mulholland Jr., USA

PSTS-10 attendees were then treated to the second annual presentation of the *Richard H. Johnson Technical Achievement Award*, recognizing an individual from the public or private sector for outstanding technical achievements resulting in significant contributions to precision strike systems.

This year the PSA was honored to present the Johnson Trophy to **Robert J. Whalen**, President and CEO of Decision Sciences. Mr. Whalen could not attend the award luncheon, but was represented by his son, Robert Whalen, who received the trophy on his father's behalf. He offered terrific anecdotes about his father, insights that only a son could provide that were both animated and entertaining. Most of all they demonstrated his father's worthiness of this award. In addition to Robert J. Whalen's significant engineering accomplishments, he is noted for his mentorship and tutorship of younger engineers, never seeking the limelight, always making sure others received credit and positive exposure.



Bob Whalen (son of Robert Whalen) accepts 2nd annual Richard Johnson Award: Dale Spencer, Earle Rudolph, Bob Whalen, Andy McHugh and Steve Roerman



PANEL ON PRECISION STRIKE OPERATIONS IN AFGHANISTAN—SUPPORTING USCENTCOM'S NEEDS: Brig Gen Mike Holmes, USAF; CAPT Roy Kelley, USN; Col Patrick McKenzie, USAF; LTC Brooke Janney, USA; Lt Col Mike Martin, USAF; Col Mike Fantini, USAF

A big highlight of PSTS-10 was the panel on Precision Strike Operations in Afghanistan. The panel was moderated by **Brig Gen Mike Holmes, USAF**, Middle East Principal Deputy in OUSD(Policy) and assisted by **Colonel Mike Fantini, USAF**, Division Chief for Combat Force Application (AF/A5RC). Panelists hailed from the Military Departments, U.S. Special Operations Command (USSOCOM) and the Air Force Special Operations Command (AFSOC).

General Holmes immediately got into the heart of the theme related to Precision Strike Technology Improvements—USCENTCOM's needs in Afghanistan and focused on the challenges related to technology, tactics, and training. **USA LTC Brooke Janney** (USSOCOM Panelist) noted that training is the most challenging and stated that we have come a long, long way in nine years. **USN CAPT Roy Kelley** (Commander, Carrier Air Wing Seven) echoed Janney's challenge and said that we have come a long way with Joint training—especially interoperability. He stated that Link 16 is a huge asset. **USAF Lt Col Mike Martin** (SOF Panelist from AFSOC) stated that CAS is looking for JTAC guys to come work for them. **USAF Col Patrick McKenzie** (AF Legislative Liaison Weapons Div Chief) reflected on jointness and the huge difference it has made. Gen Holmes picked up again to discuss joint warfare and the team effort of the International Guard that relates to pre-deployment training. Then, all the panelists chimed in and talked about some of the threats that have increased dramatically and discussed a few hard requirements.

Gen Holmes followed this discussion by talking about new precision weapons systems and how we will need to do things differently, as well as what needs to be strengthened based on foreseeable threats. Gen Holmes closed this awesome and very valuable panel by asking the panelists "what was your weapon of choice." Answers ranged from the 20mm cannon, to Laser JDAM, as well as what is airborne at the time, and anything applicable to the

COIN environment. Focus was on hitting the bad guys without harming the good guys. Bottom Line: continue to make choices and limit collateral damage.

Brandon Engle, Program Engineering Manager, BAE Systems, provided an exceptional presentation on his firm's lead effort to develop an Multi-Service Long Range Land Attack Projectile (MSLRLAP). The development effort is focused on affordable precision munitions for Army, USMC and Navy use. It takes advantage of breakthroughs in GPS receiver technology that can withstand the significant forces associated with large caliber guns and cannons. The MSLRLAP system gives the warfighter a long-range, high volume of fire, precision weapon. BAE is continuing to refine their design and it appears to be a promising weapons capability for the range of military operations from a variety of large caliber guns.



Brandon Engle

Lieutenant Colonel Patrick Sutherland, USAF, Branch Chief, Targeting Doctrine and Policy, Joint Staff, J2, provided an outstanding briefing on An Introduction to Calculating Collateral Damage. He explained collateral damage is a concern because of the laws of war, national values, and strategic risk to national goals. Lt Col Sutherland briefed the targeting cycle and how collateral damage estimation fits within the cycle. He followed that by a description of the Collateral Damage Estimate (CDE) methodology. Ultimately, commanders use CDE to inform their decisions when determining if, when, and how to employ fires in order to help mitigate civilian casualties while accomplishing their assigned missions.



Lieutenant Colonel Patrick Sutherland, USAF

Dr. Randy Simpson, Associate Program Leader for Weapons, Lawrence Livermore National Laboratory, presented on the Precision Lethality (PL) Mk-82, now referred to as the BLU-129/B, and other 3rd Generation Weapon concepts. Dr. Simpson discussed the requirements of the BLU-129/B, along with the technological background and theory of the weapon's characteristics, including a reduced collateral damage footprint. The BLU-129/B program is a Quick



Dr. Randy Simpson

Reaction Capability currently in development to fulfill a Joint Urgent Operational Need in Afghanistan.

3rd generation weapons are described as weapons that deliver desired effects on target, and only those desired effects. 1st generation weapons were bombs that primarily killed through indiscriminate fragmentation. In 2nd generation weapons guidance kits enabled precision targeting yet the bombs themselves remained 1st generation fragmentation weapons.

The vision of 3rd generation weapons is ultimately to enable operators to have selectable weapons effects. Spiral development efforts may enable one weapon to kill by either enhanced blast or focused fragmentation, and to have a dial-a-yield capability.

In keeping with the symposium's theme, **Chris McGrath** from the Defense Threat Reduction Agency (DTRA) provided the audience with a timely topic dealing with deep and buried cave targets. McGrath is the Target Intelligence Community Technologies Branch Chief. He addressed DTRAs current efforts in Point Positioning Capability in the Integrated Munitions Effects Assessment. The ability to precisely target weapons against cave targets is critical to achieving desired effects. This topic is particularly timely with the increased focus on cave targets in Afghanistan.



Chris McGrath

USAF Colonel Phillip Pratzner, Commander, Air Force Targeting Center (AFTC), spoke of the challenges of integrating six squadrons into the effort to provide timely and accurate targeting data to the warfighter. The AFTC was created to be a "one stop shop for all things targeting in the USAF." It is composed of two directorates (operations and mission support)



COL Phillip Pratzner, Jr., USAF

and the six squadrons, and since standing up in Dec 2009, it has grown dramatically and become more capable every month to conduct its mission: provide targeting and geospatial products and services, expertise and advocacy to Air Force and Joint Warfighters. Its key products and services include target development (core target materials, weaponeering, collateral damage estimations), Multi-Spectral Imagery, precise point mensuration (PPM), targeting and effects studies, combat identification, and training and certification of PPM personnel.

Mark Munsell, currently with the National Geospatial-Intelligence Agency (NGA), walked attendees through

a classified briefing on new technologies enabling 3D targeting of global threat locations. Geospatially — enabled overlays make target knowledge clearer and greatly more precise. Munsell opined that our current state of the art geospatial targeting tools are in their infancy, with significant advances at hand and constrained only by cost.



Mark Munsell

The USAF's Deputy Chief of Staff for Strategic Plans and Programs, **Lieutenant General Christopher Miller, USAF**, presented the keynote address on the second day of PSTS-10. LtGen Miller captivated the attendees with his insightful and fascinating address on precision strike technology improvements. The perspective he provided led to an excellent Q&A session and generated some terrific dialogue among attendees during the following networking break.



Lieutenant General Christopher Miller, USAF

Another highlight of PSTS-10 was the Precision Strike Investments—Meeting USCENTCOM's Current and Future Needs Panel that was requested by numerous interested parties.



PANEL ON PRECISION STRIKE INVESTMENTS—MEETING USCENTCOM'S CURRENT & FUTURE NEEDS: Lt Col Tim "Coma" Farquhar, USAF; Jim Watson; CAPT Larry "Buck" Burt, USN; Maj Matthew Sale, USMC, Col Jack Forsythe, USAF

This panel invited members from the U.S. Army, USAF, USN, and USMC to address Service requirements and precision strike investments. The investments panel consisted of **Jim Watson** (HQDA G-8), **USAF Colonel Jack Forsythe** (AF/A8PC), **USN Captain Larry Burt** (OPNAV N880C), and **USMC Major Matt Sale** (HQMC Aviation).

Lieutenant Colonel Tim Farquhar USAF, Kinetic Weapons Branch Chief, Force Application Division, Joint Staff, J-8 moderated the panel. Each Service provided a presentation highlighting their current and future precision strike requirements, investments, and challenges.

Following their presentations, the panel fielded questions from the audience, which focused on capability gaps, the potential for a "hallow force", capability portfolio reviews, and decreases in procurement objectives— among others. The panel acknowledged the most difficult aspect of precision strike investment — balancing requirements with available funds while minimizing risk.

Dr. Peter Huessy, President of GeoStrategic Analysis & Senior Defense Consultant, National Defense University Foundation, provided a sobering and thought provoking presentation on The Terror Masters. Dr. Huessy is no stranger to PSA events. He calls it as he sees it and is always enlightening. Providing the luncheon address on Day Two, he did not disappoint. His presentation on state-sponsored terrorism, the masters of terror versus the foot soldiers normally left behind to be captured and draw away our focus, was intriguing. His excellent and detailed discussion on nuclear proliferation, the EMP threat and the need for a realistic modern strategy to address terrorism was a bucket of cold water providing a reality check to those attending.



Dr. Peter Huessy

The next speaker was **Les Basak**, Principal Systems Engineer, for Lockheed Martin Missile Systems Ship and Aviation Systems. He addressed a multiple industry effort lead by Lockheed Martin to develop Electro-Magnetic Launch Technologies with Multiple Mission Applications. This game-changing technology will hopefully bring the warfighter a means to launch multiple types of munitions without the current chemical propellants and their associated hazards. Electro-magnetic launch capability will allow ships to precisely launch a variety of weapons with a rapidly rechargeable power source. The technology also brings the potential for reduced logistics and life cycle costs associated with legacy launch systems.



Les Basak

Chuck "Tooba" Kelly from Land Warfare & Munitions in AT&L discussed the Defense Department's effort to develop a series of roadmaps that will cover the conventional weapons portfolio. These roadmaps will clearly link capability areas, to current and future



Chuck "Tooba" Kelly

weapon systems, to the S&T investments that support these weapon systems. He pointed out that such a view of the weapon's portfolio was unprecedented and would not only provide better information for DoD leadership, but would also generate, through greater visibility, the opportunity between Services to leverage ongoing S&T efforts. He also pointed out that a complete understanding of the weapons portfolio will require an understanding of these capability based roadmaps and the DoD Munitions Requirements Process which produces the weapon inventory requirements for all Services.

Greg Hulcher, Deputy Director for Strategic Warfare, Portfolio Systems Acquisition, OUSD (AT&L), provided an update on progress by DoD to develop a new weapon system for Conventional Prompt Global Strike. This system will be a timely and effective weapon against a variety of emerging global threats and would be an alternate to using nuclear strategic weapons, yet achieve similar strategic objectives.



Greg Hulcher

The concluding panel of PSTS-10 focused on a hot topic that would give further insight into the nuclear future. **Dr. John Harvey**, Principal Deputy Assistant to the Secretary of Defense for Nuclear, Chemical & Biological Defense Program, chaired the panel. Panel members included representatives from OSD and the Air Force Global Strike Command.



NUCLEAR FUTURE PANEL: Greg Hulcher; Brigadier General Jeffrey Smith, USAF; Dr. John Harvey; Dr. Brad Roberts; Steve Henry

Dr. Harvey kicked off the session by introducing the panelists and noted that the nuclear plan that is in place is being implemented. He presented nuclear posture review highlights and talked about nuclear weapons capability, including the funding for DoE and DoD.

Dr. Brad Roberts, DASD for Nuclear & Missile Defense Policy in OSD Policy, addressed the Administration's Nuclear Strategy by bringing the audience up-to-date on

the Schlesinger Commission nuclear strategy and the options for working the political agenda. Roberts noted that the 2001 Nuclear Posture Review (NPR) was signed but he declared that the leadership was not in place to advance the agenda. He stated that the 2010 NPR took the options forward. Roberts informed the audience that the 2010 NPR will strengthen the security of the United States and its allies and partners and bring us significant steps closer to the President's vision of a world without nuclear weapons. Further, Roberts reviewed and discussed the five objectives that are addressed in the current NPR- 1) Preventing nuclear proliferation and nuclear terrorism; 2) Reducing the role of U.S. nuclear weapons in U.S. national security strategy; 3) Maintaining strategic deterrence and stability at reduced nuclear force levels; 4) Strengthening regional deterrence and reassuring U.S. allies and partners; and 5) Sustaining a safe, secure, and effective nuclear arsenal.

Next, **Brig Gen Jeffrey Smith**, USAF, Director of Plans, Programs and Requirements, Air Force Global Strike Command, focused on the operations plan and discussed some of the serious challenges and issues faced across the USAF. He highlighted the strategic way ahead by focusing on the B-2A, B-52H, and MM-III by pinpointing key current challenges and talking about training and required expertise, as well as risks and timelines. Smith also discussed future challenges related to the next-generation platform, infrastructure modernization and sustainment, and the future strategic environment.

Steve Henry, DASD for Nuclear Matters in OSD, presented highlights related to the U.S. Nuclear Infrastructure. Henry noted that nuclear weapons remain safe and secure, but they have exceeded their planned deployment period, making them more difficult to maintain and certify. Additionally, several of the facilities necessary to service these weapons are 50 years old and are in need of repair or replacement. He talked about the need to increase funding to maintain the weapons and infrastructure. Henry reported that the nation is committed to the President's statement that as long as nuclear weapons exist, the U.S. will sustain a safe, secure and effective nuclear arsenal.

The closing speaker was **Greg Hulcher**, Deputy Director for Strategic Warfare, Portfolio Systems Acquisition, OSD. He addressed Nuclear Systems by highlighting many of the capabilities of the strategic systems in the inventory and those being planned for the future. Next generation warheads were addressed. High precision including enhancing safety, security and reliability were highlighted. ■

Exhibitors for PSTS-10



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United States Naval Academy cadets take time from exams to attend PSTS-10.

Digital CAS Improvements On the Way

Airmen on the ground whose mission is to help deliver close air support will soon receive a set of tools that will help them do their jobs better while lightening their loads.

Tactical Air Control Party (TACP) airmen are assigned to U.S. Army tactical units and to command elements at operations centers. The TACP is a vital link between the ground commander and the combat pilot who delivers close air support to troops on the battlefield.

The upgrade is a Small Wearable Computer (SWC) that replaces the laptop TACPs now used for digital CAS communications. It is much more compact, weighing two pounds rather than eight.

The wearable computer will be fielded as soon as TACP Close-Air Support System software version 1.4.2 comes online, said USAF Capt. Sean Carlson, the program manager for the CASS software.

The new CASS software greatly improves the operating picture viewed by close air support aircraft and the one viewed by the TACPs themselves. "The previous CASS software had a limited digital capability, where the new software paints a more complete picture of the engagement area: 'friendlies,' threats, targets, attack headings, etc.," Carlson said.

According to Master Sgt. Chris Spann, a TACP assigned to the program office, this helps build the pilot's situational awareness prior to entering the engagement area. "In a troops-in-contact situation, this enables the pilot to more rapidly identify and engage ground targets," he said. "And the TACP on the ground can now see that

same operating picture on his computer."

"Version 1.4.2 allows our TACPs to operate on foot and retain the situation awareness that our guys in the tactical operations centers have," Spann added. "SA is critical to safe and effective CAS missions and ensures bombs are on target, while reducing collateral damage."

The new software also increases interoperability with Army units by making it easier for TACPs to augment close air support strikes with Army artillery fire against enemy forces or other sensitive or mobile targets.

"Version 1.4.2 streamlines the entire CAS request, coordination and control process," said Rob Bubello, program manager for TACP Modernization. "It helps TACPs get aircraft on target faster and reduces the probability of human error."

The Electronic Systems Center at Hanscom AFB, MA is developing a fielding plan now, and mobile training teams are already starting to deploy around the globe to bring users up to speed on the new software and its advantages. ■



USAF Master Sgt. Chris Spann demonstrates use of Small Wearable Computer equipped with the latest version of CAS software. Sergeant Spann is a JTAC assigned to the TAC Party-Modernization Office at the Electronic Systems Center at Hanscom AFB, MA.

Warfighters Plan for Future Fight

Warfighters serving abroad and defending the homeland, gathered in Arizona last October to tell their Guard and Reserve senior leaders what they need to improve capability in the air reserve component.

"Legacy Platforms, Future Fight," was the theme of the Weapons and Tactics Conference (WEPTAC) held at Tucson International Airport, home of conference hosts, the Air National Guard-Air Force Reserve Command Test Center (AATC) and the Arizona Air National Guard's 162nd Fighter Wing.

Nearly 1,800 Guard and Reserve airmen were in atten-

dance. "We bring in people from the field who know what is needed to make us better," said Col. Richard Dennee, the AATC commander. "These are the people who have gone to Iraq and Afghanistan and have come back with learned lessons on what they need to do their job better."

The week-long conference consisted of 28 working groups meeting to compile a list of needs for each airframe and weapon system. It concluded with group chairmen briefing their findings to Lt. Gen. Harry Wyatt III, the director of the Air Guard, and to Daniel B. Ginsberg,

See **Warfighters Plan**, Cont. on page 14

Giving Soldiers Protected Firepower

A device developed at Picatinny Arsenal, NJ was recently named a Top 10 Army Greatest Invention of 2009. The Objective Weapon Elevation Kit, or OWEK, allows soldiers to engage super-elevated targets, at up to 80 degrees, while remaining in a protective posture.



ARDEC's Objective Weapon Elevation Kit

The Armament Research, Development and Engineering Center (ARDEC) started work on the OWEK in 2008 in response to an urgent request from U.S. soldiers. ARDEC sent a working prototype to troops in Afghanistan within a month of the request.

“The warfighters were pleased with our solution and asked for immediate production and fielding of these kits,” said Sanjay Parimi, ARDEC project officer. “After receiving this feedback, ARDEC worked with the Project Manager for Mine Resistant Ambush Protected (MRAP) Vehicles, to produce and deliver 500 systems. U.S. Special Operations Command also requested 200 kits for Operation Enduring Freedom, which were fielded shortly thereafter.”

The OWEK is a two-piece kit that consists of a bearing sleeve spacer and a ballistic skirt. The sleeve spacer interfaces seamlessly with the M-2 common crew-served weapon mount to raise the entire weapon assembly by 5.25 inches, while the ballistic armor skirt covers the gap between the front gun shield and the vehicle roofline.

“By increasing the mounting height of the M-2 machine gun, the kit improves the maximum elevation from 67 degrees to 80 degrees, enabling warfighters to engage super-elevated threats

without exposing themselves to enemy fire,” Parimi said.

Used in Afghanistan to support Operation Enduring Freedom, the OWEK integrates with all major tactical vehicles, including M1114s, M1151s, M1152s, and the suite of MRAPs that use a standard crew-served weapon’s mount and an Objective Gunner Protection Kit (OGPK).

“The innovative design of the elevation kit is integral with the OGPK, so it doesn’t require any modifications to the weapon or mounts,” Parimi said. “It’s a modular design with minimal dynamic components. It’s robust, effective, and conducive to high-rate manufacture. It was entirely designed, developed and produced by soldiers and government personnel at government facilities.” ■

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News Briefs

F/A-18 DTS Makes First Flight

A USN/Boeing F/A-18F Super Hornet equipped with the Distributed Targeting System (DTS) completed its first one-hour test flight Sept. 1 at Naval Air Station China Lake, CA.

The DTS is a hardware and software system designed to provide precision strike capability against re-locatable, stationary targets, such as mobile surface-to-air missile units. The system uses sensor imagery gathered from the radar or infrared signatures emitted by potential targets. It then compares those images to reference imagery stored within DTS to accurately geolocate the potential targets.

This new targeting capability is part of the U.S. Navy's F/A-18E/F Network Centric Warfare Upgrades Program and F/A-18E/F flight plan, a program designed to ensure that the Block II Super Hornet will stay ahead of known and emerging threats through 2025 and beyond.



F/A-18F Super Hornet equipped with DTS

Captain Mark Darrah, F/A-18 and EA-18G program manager said, "This is a major architectural implementation for the flight plan upgrade and it will be a huge enhancement to the F/A-18 fleet aircraft. DTS provides real time precision strike capability to the

warfighter, where no similar capability exists today. This ability to strike threat targets with precision minimizes collateral damage to supporting ground forces in close contact."

The system is designed to reduce the time it takes to search, identify, classify, pinpoint and attack a target as well as assess the damage. With



USN Capt. Mark Darrah at NAS China Lake, CA before first flight of F/A-18F equipped with DTS.

onboard communications, a single aircraft equipped with DTS can provide multiple target points to other aircraft.

The DTS program, which will be fielded on all Block II F/A-18E/F Super Hornets, was initiated in 2004. Initial operational capability is slated for fall 2012 with operational

fielding in 2013. ■

JAGM Duel Continues

Lockheed Martin's Joint Air-to-Ground Missile (JAGM) successfully completed flying qualities tests in late 2010 on USN/Boeing F/A-18E/F Super Hornet strike aircraft.

The test series consisted of six flights from Patuxent River NAS, MD, between Oct. 5 and Nov. 2 with a total flying time of 11.2 hours.

The JAGM test articles were six instrumented measurement vehicles (IMVs) equivalent in weight, size and dimensions to tactical JAGM rounds and outfitted with resistive temperature devices, acoustic sensors and accelerometers to measure the flight environments experienced by the launchers and the missiles. The firm's JAGM candidate also scored a hit on a main battle tank at six kilometers in a company-funded, multiple-mission firing at White Sands Missile Range, NM in late November, demonstrating the ability of the imaging infrared (I2R) sensor

in the missile's cooled tri-mode seeker to lock on before launch at extended range.

At the same time, the Raytheon-Boeing JAGM contender completed the third company-funded missile launch, setting the stage for the firms to enter engineering and manufacturing development (EMD).

During the Oct. 23 test, the JAGM was fired using the Boeing-ATK rocket motor, which was designed for EMD. The test met all primary objectives including updating the flight control software and providing data to incorporate into the simulation software.

The Raytheon-Boeing JAGM features a fully integrated tri-mode seeker that incorporates semi-active laser, uncooled imaging infrared and millimeter wave guidance. The weapon leverages proven components from other Raytheon and Boeing programs, such as the Raytheon Small Diameter Bomb II and the Boeing Brimstone.

The Raytheon-Boeing team has completed six successful tests of the missile to date. Three of the tests used company funding to reduce program risk. The other three tests fulfilled a contractual obligation to the government to complete the competitive prototyping flyoff.

JAGM, designed to replace three legacy systems, offers the warfighter improved lethality, range, operational flexibility, supportability and cost savings compared with older, Cold War era weapons like the Hellfire missile.

Threshold aviation platforms include the U.S. Army's AH-64D Apache attack helicopter, the Extended Range Multi-Purpose (ERMP) Sky Warrior UAS, the USMC's AH-1Z Super Cobra attack helicopter, the USN's MH-60R Seahawk helicopter and the F/A-18

Super Hornet. The tri-service Joint Strike Fighter also is under consideration as an objective platform.

The initial operational capability of JAGM on the AH-64D, AH-1Z and F/A-18E/F is scheduled for 2016, and the IOC for the MH-60R and ERMP is 2017. ■

JASSM-ER Excels in Test Flights

Lockheed Martin's Joint Air-to-Surface Standoff Missile-Extended Range (JASSM-ER) recently flew successful test flights at White Sands Missile Range, NM, increasing the program's success rate to 91 percent in 11 flights. The live 2,000-pound class missiles, released from B-1B bombers, effectively navigated to and destroyed their intended targets.

The primary flight test objectives were to demonstrate end-to-end system performance while exercising the missile's alternate terminal engagement profile and Time-on-Target (TOT) mode: the ability to control time of flight to engage time critical targets. During the TOT first-time event for JASSM-ER, the missile adjusted its cruising speed throughout the flight profile based on winds and other atmospheric data.

The first JASSM-ER missile was released from an altitude of 13,000 feet and a speed of 0.72 Mach, while the second missile was released from 30,000 feet at 0.88 Mach.

USAF Col. Steve Demers, the JASSM program manager, said, "in my 25 years of Air Force Acquisition, I have never seen a more successful air launched cruise missile developmental test program! I'm confident JASSM-ER is ready for production."

The Initial Operational Test & Evaluation phase, comprising 16 flights, would commence in the second quarter of 2011, with produc-

tion missile deliveries beginning in late 2012.

JASSM-ER is an autonomous, air-to-ground, precision-guided standoff missile. It shares the same powerful capabilities and stealthy characteristics of the baseline JASSM, but with more than two-and-a-half times the range. ■

LM Bids for CIRCM

Lockheed Martin Missiles and Fire Control, DRS Technologies and Daylight Solutions are partnering to address the U.S. Army's Common Infrared Countermeasure (CIRCM) technical development requirement. The CIRCM program will provide laser defeat capability to rotary-wing aircraft operating in close terrain flying missions where man portable air defense systems represent a significant threat.

Lockheed Martin's CIRCM solution is a lightweight laser defeat system that incorporates a pointer tracker and commercial off-the-shelf processor and quantum cascade laser. It has been successfully integrated with the existing Common Missile Warning System and is compatible with next-generation missile warning systems.

The system's compact, streamlined design and modular open system architecture make it adaptable to a wide range of rotary-wing platforms and expandable to new threats and missions. CIRCM platforms will include the U.S. Army AH-64, UH-60 and CH-47 rotary-wing aircraft.

DRS Technologies' Reconnaissance, Surveillance and Target Acquisition business group is an experienced provider of advanced electro-optic infrared technology. Daylight Solutions has developed and demonstrated quantum cascade laser (QCL) technology for Defense and Security applications. ■

RAAF Employs JSOW C

The Royal Australian Air Force recently launched two Raytheon Joint Standoff Weapon Cs from the RAAF's new F/A-18E/F Super Hornet, marking the first time a U.S. ally has operationally tested a JSOW C. This test series also marked the first time the JSOW C variant has been employed outside the continental U.S.

The RAAF has placed an order for the JSOW C-1, which is currently in production; deliveries are expected to begin in 2011. The JSOW C-1 maintains the land attack capability of JSOW C and adds a moving maritime target capability by incorporating a datalink. This enables the JSOW to receive target updates as it flies to its target.

JSOW is a family of low-cost, air-to-ground glide weapons with a range of 70 nautical miles (80.5 statute miles) that employs an integrated GPS-inertial navigation system and terminal uncooled infrared seeker that guides the weapon to the target. The JSOW C carries a single BROACH warhead that has blast, fragmentation and penetration effects. JSOW is integrated on all variants of the F/A-18 and will be integrated on the Joint Strike Fighter. ■

Next-Gen Aegis Missile

Boeing, Lockheed Martin and Northrop Grumman have submitted competing proposals to the U.S. Missile Defense Agency (MDA) for the concept definition and program planning phase of a Next Generation Aegis Missile (NGAM).

NGAM is a key component of the Obama administration's Phased Adaptive Approach for missile defense in Europe, providing capability against emerging longer-range ballistic missile threats.

The Next-Generation Aegis Missile will provide early intercept capability against some short range ballistic missiles, all medium range ballistic missiles, all intermediate range ballistic missiles and non-advanced intercontinental ballistic missiles threats as a key element of the Phased Adaptive Approach, which will provide robust defensive capabilities against regional threats on a global basis. It will be designed for integration into the Aegis Weapon System, with the Aegis BMD 5.1 and the MK 41 Vertical Launching System, both ashore and at sea.

The MDA said the 32-month concept definition and program planning phase will begin in 2011, with deployment scheduled for the 2020 time frame. This phase will focus on defining design objectives, conducting trade studies to establish a technical baseline, reducing technology risk and developing an executable program plan. A competitive product development phase will follow. ■

New Warhead for Tomahawk Block IV Missile

The U.S. Navy last August completed the first live test of the Joint Multi-Effects Warhead System (JMEWS), meeting all performance objectives for the new warhead for the Tomahawk Block IV tactical cruise missile.

The JMEWS program is designed to deliver a warhead that will give the Tactical Tomahawk Land-Attack Missile all of the same blast-fragmentation capabilities that make it a formidable weapon today and to introduce enhanced penetration capabilities into a single warhead.

"This static test of the JMEWS program brings this powerful capability one step closer to potential inte-

gration into the Tactical Tomahawk Block IV missile, delivering enhanced capabilities to the operationally proven system," said Captain Dave Davison, the U.S. Navy's program manager for the Tomahawk Weapon System. "This first test demonstrates that the program is on schedule and moving forward as planned."

During the August 16 test, the warhead detonated, creating a hole large enough for the follow-through element to completely penetrate the concrete target and pass through two witness plates.

"The future of the Tomahawk Block IV missile includes a series of affordable enhancements to make the system more capable for the warfighter," said Gary Hagedon, Raytheon's Tomahawk program director. "JMEWS is the first of the planned system enhancements, and this test demonstrates that we have the right team in place to deliver these capabilities." ■

Scorpion Stings in Live Fire Tests

Textron Defense Systems says its XM1100 Scorpion networked ground munitions system successfully completed U.S. Army hot environment performance testing at Yuma Proving Ground in Arizona, marking a key milestone in the verification of Scorpion system performance across all operational environments.

The Scorpion system performed successfully during live-fire engagements against moving main battle tanks and medium armored personnel carrier targets, scoring hits with its highly lethal explosively formed penetrator warhead in 100 percent of these live fire tests.

The Scorpion system consists of an advanced munition control station that provides the soldier with situational awareness and positive

control of the Scorpion munitions, and the Scorpion munitions' dispensing module (DM). It fuses sensor data from a single DM or a field of multiple networked DMs in order to detect, track, classify, report, engage and destroy targets. ■

New Weapon for UAS

Raytheon has successfully flight tested a Small Tactical Munition (STM), a new weapon specifically designed to be employed from unmanned aircraft systems (UAS).

STM is a 13-pound guided bomb that is approximately two-feet long, making it the smallest bomb in the Raytheon family of weapons. The bomb's dual-mode, semi-active laser seeker and GPS-inertial navigation

CALENDAR OF EVENTS

Precision Strike Annual Review

Date: February 23-24, 2011

Location: Emerald Coast Conference Center, Ft. Walton Beach, FL

Precision Strike Summer Forum

Date: June 21-22, 2011

Location: Huntsville Marriott, Huntsville AL

More information TBD — Please check our website: www.precisionstrike.org

Precision Strike Technology Symposium

Date: October 26-27, 2011

Theme: Precision Strike Improvements to Support US Global Influence

Location: Johns Hopkins University Applied Physics Laboratory—Kossiakoff Center, Laurel MD

This symposium will be held at the SECRET/NOFORN Level

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

system enable the weapon to engage both fixed and moving targets around-the-clock, regardless of weather conditions.

Raytheon flight tested two STM weapons on two separate passes from a Cobra UAS. The GPS-INS guided the weapons to a mid-course position where the semi-active laser seeker precisely guided the weapon to the target, achieving all test objectives. ■

Phalanx Completes Live-Fire Demo on Land

Raytheon and Oshkosh, partnering with the U.S. Army and U.S. Navy, proved the maneuverability,

integration and performance of the Mobile Land-Based Phalanx Weapon System (MLPWS) during a recent live-fire demonstration.

The MLPWS integrates the Centurion Land-Based Phalanx Weapon System on a Heavy Expanded Mobility Tactical Truck (HEMTT) A3. All functions of the Centurion design featuring the Phalanx Block 1B are maintained on the MLPWS, which provides a more flexible component to the U.S. Army's Counter-Rocket, Artillery and Mortar initiative.

The system successfully tracked, engaged and destroyed nine inert mortars. MLPWS also maneuvered more than 28 miles on paved and

off-road conditions without any damage to the system. All MLPWS functions were integrated with the HEMTT platform and performed flawlessly.

In the MLPWS configuration, Phalanx uses a 20 mm M61A1 Gatling gun that fires M-940 self-destruct rounds at a rate of 4,500 shots per minute. The system features an advanced search and track radar with closed-loop spotting technology that enables autonomous target detection and engagement. Phalanx can be interfaced with other sensors and systems to provide overarching protection of high-value sites on the ground. ■

Warfighters Plan,

Continued from page 9

the assistant secretary of the air force for manpower and reserve affairs.

AATC engineers find low-cost, highly-capable, off-the-shelf solutions. One example was an early model F-16 Fighting Falcon equipped with the latest technology in precision weapons.

"We're putting the newest weapons and latest LITENING targeting pods on the oldest aircraft in the inventory," said Lt. Col. Todd Seger, the combined test force director for AATC. "We have small weapons racks that carry four Small Diameter Bombs on each wing. This

is the first time they've been integrated on the F-16."

WEPTAC helps AATC officials ensure they are prioritizing projects that are relevant to everyone, not just for the F-16, said Seger, so that Air Force mission is better served as a whole. "It's the best job in the world," he said. "We get to use new aircraft weapons software, new pods, new weapons and produce capability that makes the warfighter safer and more lethal."

Test center engineers applied input from the field to improve combat search and rescue operations. They upgraded the HH-60G Pave Hawk helicopter with dual smart-color

multi-function displays for pilots and co-pilots, replacing outdated monochrome displays.

The new touch-screen LCD displays are full color and offer an array of tools including moving maps, forward-looking infrared and a turret camera.

"It's an awesome system," said Lt. Col. Jeff Peterson, the CSAR program manager for AATC. "I can run a full-up situational awareness data link, I can link a helmet-mounted cueing display and I can access a full moving map, which makes it so easy. I used to fly with a (computer) on my lap and pass it back and forth with the co-pilot. Now we both have linked displays that make everything safer and more efficient." ■

Annual Review,

Continued from page 1

many of the challenges faced by our coalition partners.

Our co-hosts invite us to beautiful Ft. Walton Beach to get away from the pressures of Washington, D.C. for a couple of days of professional

exchange. Their intent is for PSAR-11 to showcase select precision strike requirements and systems in a relaxed atmosphere as DoD continues to seek efficiencies in the current fiscal environment.

And you won't want to miss the presentation of the 15th Annual

William J. Perry Award that will take place on the opening day of PSAR-11. So, please join our tremendous speakers from across the joint spectrum for this unique opportunity. See page 15 for focus areas during PSAR-11. We look forward to seeing you at Ft. Walton Beach! ■

Program Highlights

PRECISION STRIKE ANNUAL REVIEW (PSAR-11)

23-24 FEBRUARY 2011

EMERALD COAST CONFERENCE CENTER — FT. WALTON BEACH

Eglin AFB CO-HOSTS

Air Armament Center & Air Force Research Laboratory

Theme:

Precision Strike with Coalition Partners

— Showcasing Select COCOM Regional Sessions —

COCOM representatives to chair four Coalition Partners Sessions

More than 16 Coalition Partners have been invited to address their top precision strike priorities and budgetary constraints

— *Other Riveting Agenda Topics* —

International Cooperation

National Military Strategy-Shared Interests/Shared Responsibilities
w/Coalition Partners

Coalition Policy, Cooperation & Operations

Weapons Systems Acquisition

Acquisition at the Tip of the Spear — USSOCOM Perspective

Air Armament Center Perspective

Weapons S&T Investment Areas

NIPO, SAF/IA & USASAC Perspectives

Presentation of 15th Annual William J. Perry Award

IN THE NEXT ISSUE

Wrapup on Precision Strike Annual Review 2011

PRECISION STRIKE ASSOCIATION CORPORATE MEMBERS

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