

## PSTS '04 Wrapup:

### Accelerating Joint & Coalition Technology Advances for Precision Strike

The Precision Strike Association held its 14th Precision Strike Technology Symposium (PSTS) on October 12-14, 2004, in the Kossiakoff Conference Center at the Johns Hopkins University Applied Physics Laboratory (JHU/APL) located in Laurel, Maryland.

The annual symposium was well attended, as always, perhaps a testament to the growing recognition of the impact of precision strike weaponry on the art of warfare.

PSA Chairman Wayne Savage presented a special award to Secretary of Defense Donald Rumsfeld. It was accepted by his deputy, Honorable Paul Wolfowitz,



Deputy Secretary Paul Wolfowitz accepts PSA award for Defense Secretary Rumsfeld

on Oct. 12. The award recognizes the U.S. defense chief's "critical insight, vision and commitment to our nation in advancing and improving precision strike systems in defense of the United States."

In accepting the award for Mr. Rumsfeld, Deputy Secretary of Defense Wolfowitz said "work that the precision strike community has done is enormously critical, and I cannot thank you enough for helping the secretary of defense to ensure that precision strike systems will revolutionize the way we do business."

In his remarks, Mr. Wolfowitz recounted some historical lessons, commenting on their impact on the future of precision strike. "It is clear that the most effective way to do long range precision strike is through the integration of air and land forces," he concluded.

See **Wrapup**, Continued on page 3

## Honorable Ryan Henry to Keynote Winter Roundtable 2005

The *Way Ahead for Quadrennial Defense Review 06 and Precision Strike* is the theme of Winter Roundtable 2005 sponsored by the Precision Strike Association (PSA).

Scheduled for Wednesday, 26 January 2005 at the Crystal Gateway Marriott, the objective of this unclassified forum is to gain insight into how the precision strike community should plan to address and meet the future key security challenges facing the United States.

As always, Winter Roundtable 2005 provides an opportunity to

become better informed about current national defense policy, strategies, and national security issues related to precision engagement.

PSA presents Ryan Henry as the keynote speaker for this popular all-day annual event. He was appointed by U.S. President George W. Bush, confirmed by the U.S. Senate, and has served as principal deputy under secretary of defense for policy since February 2003. Mr. Henry's professional career spans 24 years of



Honorable Ryan Henry

military service, including work in government operations, leading-edge research and development, and policy analysis.

He is a key advisor to the senior Pentagon leadership on policy, strategy, transformation, force structure, and global posture. He also advises on the execution of deliberate and contingency plans in support of the national objectives.

In his strategy role, Mr. Henry is  
See **Ryan Henry**, Continued on page 11

# Chairman's Column



### Published by:

The Precision Strike Association  
2111 Wilson Blvd - Suite 400  
Arlington, VA 22201-3061  
tel: 703-247-2590 fax: 703-527-5094  
www.precisionstrike.org  
info@precisionstrike.org

### Officers:

*Chairman:* Wayne Savage  
*Vice-Chairman:* Bill Dalecky  
*Chair for Programs:* Ginny Sniegion  
*Chair for Communications:* Robert Houser  
*Chair for Membership:* Dr. Dean Larson

### Staff:

*Executive Director:*  
MG Paul L. Greenberg, USA (Ret)  
*Executive Administrative Assistant:*  
Dawn Campbell  
*Editor:* Ramon Lopez  
*Graphic Artist:* Renee Korbely-Maiz

### Board of Directors:

Tony Ammendolia, Aerojet • Tim Beard, BAE Systems Mission Solutions • LTC Ken Britt, USA, 18th Airborne Corps Artillery • RADM John Chenevey, USN (Ret) • COL John Croghan, USAF, Chief, Weapons-Air & Space Operations • Harvey Dahljelm, ITT Industries, Defense & Electronics • Bill Dalecky, Smiths Aerospace • Bob Dawson, Smiths Aerospace • Douglas Detwiler, PEO (W) • Mike Eddings, SAIC • Ross Hatch • Harry Heimple, Northrop Grumman • Bob Houser, Boeing • Maureen Koerwer, EDO Corp. • Dr. Dean Larson, CNA • RADM Walter M. Locke, USN (Ret) • Andy McHugh, Lockheed Martin • George M. McVeigh, SAIC • COL Lance Moore, USA, HQ, US Army • JT Morris, Whitney, Bradley & Brown, Inc. • CDR Cathal O'Connor, Global Strike, J-8 FAAD • CAPT Deke Philman, USN, OPNAV N780C • Ray Preston, Williams International Corporation • Earle Rudolph, ATK • Richard Rumpf, Rumpf Associates International • Wayne Savage, Raytheon • Ginny A. Sniegion, IDA • CAPT Vic Steinman, USN • Major Chad Stevenson, USAF, SAF/AQ • CAPT Scott Swift, USN, OUSD AT&L DS (AW) • Mike Underwood, Honeywell • Dr. John Walter, JHU/APL • Tom Weller, Raytheon Technical Services Company • Diane Wright, OUSD(AT&L)S&TS

The Precision Strike Digest is published bimonthly. Correspondence should be sent to the above address. The Association assumes no responsibility for unsolicited materials; these require return postage. Reproduction in whole or part is authorized with the appropriate credit. Copyright © 2004 by the Precision Strike Association, Inc. Postmaster: Please send any address changes received to the location identified above.

## Changes Arrive with the Autumn Leaves

**W**e certainly have had an exciting fall. The presidential election is over with U.S. President George W. Bush poised for his second term.

While the chief executive remains in office, I am sure over the next few months we will see some changes in the Bush administration. My bet is that most of the cabinet members will be around through the year with a gradual changing of the guard starting in early 2005. We will also see changes over on Capitol Hill in several committee and leadership positions. Place your bets as appropriate.

The other big event this fall was the 2004 edition of the Precision Strike Technology Symposium. Preparations for this event were not quite as long as the Presidential campaign, but were just as intense. The event was first rate, as always, and well attended.

My special thanks to everyone involved, including your Board of Directors, the Association staff, PSA Programs Chair Ginny Sniegion, and USN RADM (Sel) Jim Hart, programs vice-chair. Kudos are also extended to the PSTS-04 tri-chairs, technical chairs and warfighter representatives for a job very, very well done. And of course let's not forget the keynote speakers and the other pres-

enters for their insight and involvement.

We were extremely pleased to give Secretary of Defense Donald Rumsfeld special recognition for his enduring and steadfast support to the art and science of precision strike. We are pleased that Paul Wolfowitz, Secretary Rumsfeld's deputy, was able to attend part of PSTS-04 to accept the award for the U.S. defense chief, while providing kind words regarding the efforts of the Precision Strike Association.

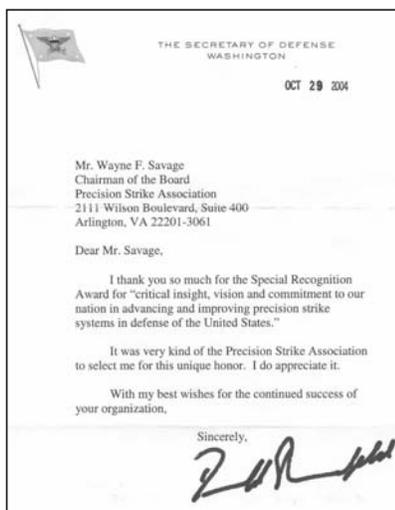
Meanwhile, the war on terrorism continues. Have you been paying attention to the impact (no pun intended) of precision engagement? Our troops in both Iraq and Afghanistan are using precision engagement techniques, procedures and weapons with dramatic and positive results. Clearly collateral damage and fratricide have been kept at bay.

Now on to the New Year. I look forward to January 2005 when we will have a presidential inauguration, convening of a new session of the U.S. Congress and, of course, PSA's Winter Roundtable. A preview of

the well-attended annual one-day event is contained in this issue of the *Precision Strike Digest*. Don't miss out. Mark your calendars now. You won't regret it.

That's the view from Wayne's World... ■

Wayne F. Savage  
Chairman of the Board  
Precision Strike Association



**Wrapup,** Continued from page 1

He said the U.S. military's precision strike capabilities have improved dramatically in recent years, but more work must be done to address the challenge of hitting mobile targets.

"Precision targeting is relatively easy for fixed targets. But the most important targets are the ones that move around, staying put for only short periods of time. It's not just a matter of finding the information. It's a matter of finding it in a timely way," said Wolfowitz.

On the first day, opening remarks from David K. Sanders, the Navy's deputy program executive officer for strike weapons, noted the "promise and pitfalls" of precision strike net-centric weapons, using Tactical Tomahawk's DT&E results to make his case. "Net-centric weapons are much different animals than what we dealt with in the past."

Following Sanders at the podium was Army LTG William Wallace, commanding general, U.S. Army Combined Arms Center, who offered his personal observations on Operation Iraqi Freedom. "There is absolutely no question that we can be extraordinarily precise. But the real issue is how to apply that precision on a contemporary environment, against an enemy that is increasingly imprecise, in an environment where decision-making is becoming a bit more difficult."

Dyke Weatherington, the Pentagon's unmanned aerial vehicle expert, discussed how UAVs continue to populate the battlefield, with more than 400 drones now fielded with U.S. military forces.

Dr. Lee Willett, an expert on the

UK Royal Navy, updated PSTS-04's attendees on the continued slide in UK warship procurement that is making it "increasingly difficult for the Royal Navy to bring its best game to coalition operations."

Clay Davis, Air-to-Surface Weapons Staff Specialist, OUSD (AT&L)/Defense Systems presented a timely and informative review of level attack weapons capabilities.

COL Dave Minster, USAF, Deputy Director for Targets, the Joint Staff (J2T) discussed the joint staff vision for targeting.

Dr. Ted Bially, the director of DARPA's Information Exploitation Office (IXO), opened the second day of the symposium by focusing on DARPA's Enabling Technologies.

His discussion gave the precision strike community greater insight into DARPA's mission for bridging the gap for the Military Services' science and technology programs.

The Targeting Session focused on technologies to accelerate joint and coalition precision strike, discussing sensors, platforms, operational concepts, mathematical models, communications and control links that are responsive to precision engagement and our ability to precisely deliver the right payload at the right time.

Nicholas Barresi from JHU/APL followed with a presentation with film clips of actual test launches documenting Tomahawk IV missile effectiveness against moving targets. Northrop Grumman's Jeffery Cavins closed out the session by discussing future technologies for the enhancement of target location systems.

The C4ISR Session included an "Enable Precision Engagement" presentation by Jon Dorn of BAE SYS-

TEMS. By leveraging best commercial practices BAE Systems Mission Solutions has developed a pilot system, Enterprise Targeting and Strike System (ETSS), to demonstrate the innovative concepts and architectural features needed to transform the systems of today into the network-centric capabilities of tomorrow.

Kevin Peppe of Raytheon presented an overview on the Time-Sensitive Target Mission Solution—Integrated Real-Time Targeting System involving the as is, to be, and could be Battlespace with a focus on defining characteristics of that future Battlespace. Rick Ludwig followed with an overview of the X-47B, Northrop Grumman's entry in the Joint Unmanned Combat Air Systems (J-UCAS) program.

JHU/APL's Doug Crowe believes today's battle space is characterized by a collection of independently developed combat systems designed to meet very specific mission goals. His presentation described this situation and the limitations it places on the warfighter. Attributes for a net-centric end-to-end architecture that would bridge these stove-piped systems to form a theater wide view of the entire airspace was described.

In a luncheon address, VADM Thomas R. Wilson, USN (Ret.), senior vice president, Alliant Techsystems, and a former director of the Defense Intelligence Agency, discussed "the nexus between precision strike and precision intelligence." He said "there is an absolute requirement that precision strike be well supported." Regarding the debate on national level intelligence, Wilson warned "against programmatic or budgetary 'flip flops' between national intelligence versus support for military operations."

The Weapons Session included three topics: the Advanced Anti-



Ted Bially



LTG William Wallace, USA

See **Wrapup,** Continued on page 4

**Wrapup,** Continued from page 3

Radiation Guided Missile (AARGM), the Viper Strike precision guided munition and next generation gunship technologies. These presentations provided the opportunity to update and expand discussion and knowledge of the “end game” of precision strike.

ATK Missile Systems’ Darcy McGinn presented options to grow the HARM missile into a more autonomous, precision weapon. Improvements such as greater geospecificity, increased accuracy and significantly reduced reliance on a cooperative signal are just some of the increase capabilities.

Northrop Grumman’s Richard Schultz’s presentation addressed challenges warfighters are dealing with today in attacking targets with demanding collateral damage con-

straints as well as expanding their capability to exploit more readily available, very accurate targeting data. The potential that Viper Strike brings to the warfighter is significant in both the lethality and flexibility it could provide across a spectrum of platforms.

Those platforms include gunships, which provided a segue into ongoing work at the Naval Surface Warfare Center. The presentation by Bill Elliot focused more on the importance and value of process in developing capability either through hardware, software or tactical improvements. There was a direct correlation between these last two presentations, highlighting the value and synergy of close collaboration and communication between government and industry in bringing precision to the warfighter.

In the Effect Session, Freidrich “Bobby” Koch presented a briefing on the unique capabilities of the Taurus KEPD 350 standoff missile. The presentation covered the penetration capabilities of the missile as well as video documenting some test shots. The weapon is equipped with a layer-counting and void-detecting hard target fuze.

While the Taurus KEPD 350 presentation examined hard target attack from the weapon system perspective, the next presentation focused on the fuze required to attack hard and deeply buried targets. Dale Spencer described Kaman Aerospace/TDW Buried Target Fuze (BTF). The presentation described how the BTF evolved and how it performs. It also covered the capabilities, features, and benefits of BTF.

Drapier Laboratory’s Tim Easterly presented a description of the GPS/INS-guided LCGEU that is designed for use on both Extended Range Guided Munition (ERGM) and Ballistic Trajectory Extended Range Munition (BTERM) war-

heads. Both ERGM and BTERM are candidate warheads for rounds fired by naval guns and the LCGEU has been tested on both ERGM and BTERM rounds. The results of some of these tests were presented.

During the classified technical sessions, Steve Dowling from DTRA addressed WMD Counterproliferation/Counterforce and Hard Target Defeat Programs. He provided an update on current DTRA weapons effects tests conducted to date to defeat hard targets and WMDs. DTRA has active programs in these areas that are making excellent progress. Testing is proceeding.

Next, Michael White presented the latest JHU/APL efforts in characterizing concepts for the employment and development of high-speed missiles to reduce reaction time from target identification to the striking of targets.

Bill Craig from SeiCorp then presented an update on the GRID-LOCK Advanced Concept Technology Demonstration. GRID-LOCK provides Unified and Joint Task Force Commanders the capability to quickly and automatically tie the time-sensitive advantage of tactical sensors

to geospatial coordinates in support of precision guided munitions. This capability will involve the rapid georegistration of motion imagery from unmanned air vehicles and the immediate extraction of precise coordinates for targeting or follow-on surveillance tasking.

Then, CDR Calvin Craig from OPNAV (N-81) presented the latest events in the development of a High Speed Anti-Radiation Missile replacement. Current efforts were detailed.

Alan Gauzens from ATK and Willy Toledo from ARDEC closed out the second day by discussing Mid-Range Munitions – Kinetic Energy. They presented information

**Precision Strike Association  
would like to thank the  
following PSTS 2004  
Sponsors & Exhibitors**

Aerojet  
ATK Alliant Techsystems  
EDO Corporation  
General Dynamics  
Goodrich  
Honeywell  
Kaman  
Lochheed Martin  
MBDA Missile Systems  
NAVSEA Warfare Center  
Northrop Grumman  
Orbital  
QinetiQ  
Raytheon Company  
The Boeing Company  
Ultra Electronics

on the latest efforts in use of kinetic energy munitions to defeat current and projected target sets. Modeling and Simulation of such weapons were reviewed.

Charles Watson from the Air Force Intelligence Center at Wright Patterson AFB kicked off the third and final day, presenting a wide-ranging threat assessment review of current and projected precision strike weapons developments by numerous countries.

USMC LtGen Bob Magnus then took the stage, noting that since allied action in Kosovo there has



LtGen Magnus

been an exponential increase in precision strike capability. Precision strike is the synergy between fires and maneuver, especially enacted over great distance. The increased

capabilities inherent in today's precision strikes have placed great stress on joint command and control, and all services are applying effort towards improved C4 systems he stated.

LtGen Magnus stressed that the USMC has placed specific emphasis on expeditionary strike as well as command and control in order to harness the results of precision fires from the individual Marine through carrier based aviation. He challenged the precision strike community to concentrate on the real issues related to the complex decision-making techniques that must be applied to full spectrum operations as we witness changes to the threat.

Next, Navy Captain Chuck Wright from OSD's Operational Test and Evaluation Office presented a very informative perspective on the operational level of war. Operational Lessons Learned from OIF and OEF included re-learning "old" lessons

such as the effect of weather on laser guided weapons and training how you fight, and "new" lessons, such as how to work with unmanned aerial vehicles and non-line of sight close air support of friendly ground forces.

Key improvements over the past ten years are a) jointness as observed in the Joint Force Headquarters and in the field works in combat and b) our investments in precision weapons have paid off in an order of magnitude improvement in targets destroyed per sortie.

Captain Wright stated that our ability to track and identify friendly forces on the battlefield is not as good as it should be. Further, our joint intelligence capability to keep track of the enemy and provide battle damage assessment is also not as good as it needs to be.

USSTRATCOM's Brig Gen Kevin Kennedy, USAF, offered the precision strike community a fine synopsis of the fact that long-range precision strike has come a long way—because of technology, tactics, doctrine and jointness.

In the future, Kennedy believes that the U.S. needs to combine precision strike with even greater speed and/or persistence (loitering in/over/near the battle area) to deliver non-kinetic or kinetic precision strike ordnance in near real-time.

He stated that STRATCOM's future successes are predicated on working well with a Joint Team—Industry to produce the force capabilities; interagency organizations to produce the accurate knowledge; and, components to execute flawlessly—with speed-of-light—anywhere in the global sphere of operations.

USAF Maj Gen Chuck Simpson from USJFCOM said jointness among the services is now a reality and is essential on today's battlefield. As this concept matures, the Joint Force Commander will be able to bring together a more cohesive, tai-

lored force to meet the demands of today's asymmetric threat.

Calvin Hickey from the National Geospatial-Intelligence Agency and Michael Krechel from the Aberdeen Proving Ground discussed the need to know exactly where and what your target structure looks like inside and out.

Dr. David Keese of the Sandia National Laboratory closed out the symposium by showcasing some of the new nanotechnology under development at SNL. This will take the Predator's SAR radar, for example, to a system less than half the weight with no loss in very fine resolution. This MESA SAR technology was shown to have application to unattended sensors that will continue to play an even larger role in pinpointing moving targets for engagement.

For the second consecutive year, a few midshipmen from the U.S. Naval Academy attended the annual symposium. The middies stated that



Middies with USAF Maj Gen Simpson and USN Capt Wright

much of the subject material of the symposium was a good fit to their academic coursework.

PSTS-04 was great for their training as junior officers. This was an ideal time to witness presentations on many of the precision strike systems they will be operating after they graduate.

The students are interested in participating in PSA's "Winter Roundtable" scheduled for 26 January. The intent is to eventually invite students from the other U.S. military academies as well. ■





1 **Keith Sanders**—Deputy PEO for Strike Weapons & Unmanned Aviation

2 **Bill Dalecky**—PSA Vice Chair, **Wayne Savage**—PSA Chairman, **LTG William “Scott” Wallace, USA**—Commanding General, U.S. Army Combined Arms Center and Fort Leavenworth, **Gimny Sniegon**—PSA Programs Chair, **Dr. John Walter**—PSTS Tri- Chair

3 **Dyke Weatherington**—Deputy, UAV Planning Task Force, OUSD(AT&L)/Defense Systems

4 **Dr. Charles Holland**—DUSD (S&T)

5 **Dr. Spiro Lekoudis**—Director, Weapons Systems, DUSD (S&T)

6 **Dr. Lee Willett**—Head of Military Capabilities Programme, Royal United Services Institute for Defence & Security Studies, Whitehall, London

7 **Clay Davis**—Air-to-Ground Weapons Staff Specialist, OUSD(AT&L)/Defense Systems

8 **Colonel Dave Minster, USAF**—Deputy Director for Targets, The Joint Staff (J2T)

9 **Alan Gauzens**—ATK

10 **Dr. Jeffrey Cavins**—Northrop Grumman, PSTS Targeting Chair: **Manny Garrido**—Battlespace, Inc, **Dr. Ted Bially**—Director, DARPA/IXO, **Nicholas Barresi**—JHU/APL

11 **Doug Crowe**—JHU/APL, **Rick Ludwig**—Northrop Grumman Corp., PSTS C4ISR Chair: **Tim Beard**—BAE Systems, **Kevin Peppe**—Precision Engagement, Raytheon Missile Systems, **Jon Dorn**—BAE Systems Mission Solutions

12 **Bill Elliott**—Naval Surface Warfare Center Dahlgren Division, **Richard Schultz**—Northrop Grumman Corp., **Darcy McGinn**—ATK Missiles Systems Co. LLC, PSTS Weapons Chair: **Captain Scott Swift**, USN, OUSD(AT&L)/Defense Systems, Air Warfare

13 **PSTS Effects Chair: Dr. Dean Larson**—The CNA Corp., **Dale Spencer**—Kaman Aerospace, **Friedrich-W. Koch**—TAURUS Systems GmbH, **Timothy Easterly**—Draper Laboratory

14 **CDR Calvin Craig, USN**—OPNAV N81, **Linda Johnson**—SeiCorp., PSTS Chair: **George McVeigh**—SAIC, **Bill Craig**—SeiCorp, Inc., **Steve Dowling**—Chief, WMD Counterforce Branch, Technology Development Directorate, Defense Threat Reduction Agency

15 **Willy Toledo, USA**—ARDEC, MS & TD, Aeroballistic Division

16 **Charles Watson**—Air Force Intelligence Center, Wright Patterson Air Force Base

17 **VADM Thomas R. Wilson, USN (Ret.)**—Senior Vice President, Alliant Techsystems

18 **CAPT Chuck Wright, USN**—Office of the Deputy Director Air Warfare, OT&E

19 **BG Kevin Kennedy, USAF**—Director, Strike Warfare, United States Strategic Command

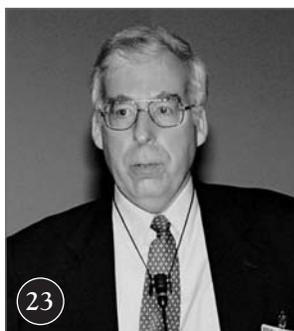
20 **Harvey Dahljelm**—PSTS Tri-Chair, **Dr. Richard Roca**—Director, APL, **Hon. Paul Wolfowitz**, **Gimny Sniegon**—PSA Programs Chair, **Dr. John Walter**—PSTS Tri-Chair, **George McVeigh**—PSTS Tri-Chair

21 **Northrop Grumman**—Sponsors and Exhibitors at the 14th Annual PSTS

22 **Dr. David Keese**—Deputy Director, Aerospace Systems Development Center, Sandia National Laboratory

23 **Calvin Hickey**—Future Warfare Systems Office, NGA InnoVision Directorate, National Geospatial-Intelligence Agency

24 **Michael Krechel**—Technical Manager, Joint Technical Coordinating Group for Munitions Effectiveness, Aberdeen Proving Ground



# U.S. Navy Places Another Arrow in its Quiver

The U.S. Navy in late September formally welcomed Raytheon's Tomahawk Block IV cruise missile into the Navy's arsenal at a fleet introduction ceremony at the Pentagon.

The Block IV officially achieved initial operating capability (IOC) on May 27, 2004, with the loading of the first missile onboard USS Stethem (DDG-63), a guided missile destroyer.



“The Block IV Tomahawk provides a substantial battlefield edge to our warfighters,” said Navy Capt. Bob Novak, Tomahawk All-Up-Round program manager. “It is a great day for the Navy to formally celebrate the hard work of the Navy-Raytheon team that enabled the fleet introduction of this revolutionary weapon, whose flexible targeting and loitering capabilities build on the tremendous 32-year tradition and success of the legacy Tomahawk program.”

Louise L. Francesconi, Raytheon Missile Systems president said “The Block IV Tomahawk is the result of the collective commitment of the Navy and Raytheon to provide affordable, operational capabilities for critical long-range, precision strike missions.”

John Young, Navy assistant secretary, called the missile system “an elegant solution” that adds new capabilities to the fleet while costing

taxpayers half of what the current Tomahawk costs.

Also known as the Tactical Tomahawk (TacTom), the Block IV Tomahawk is the centerpiece of the Navy's new Tomahawk Baseline IV Weapons System. The system integrates the Block IV missile with improved mission planning and platform weapons control capabilities. This latest version of the Navy's

surface- and submarine-launched precision strike standoff weapon incorporates innovative technologies to provide unprecedented operational capabilities while dramatically reducing acquisition, operations and support costs.

The Block IV costs less than half the price of a newly built Block III missile. Additionally, the Block IV missile will have a 15-year warranty and recertification cycle, compared to the Block III variant's eight-year recertification cycle.

The new capabilities that Block IV Tomahawk brings to the Navy's sea strike capability are derived from the missile's two-way satellite data link that enables the missile to respond to changing battlefield conditions. The strike controller can “flex” the missile in flight to preprogrammed alternate targets or redirect it to a new target. This targeting flexibility includes the capability to loiter over the battlefield awaiting a more critical target.

The missile can also transmit battle damage indication imagery and missile health and status messages via the satellite data link. For the first time, firing platforms will have the capability to plan and execute Global Positioning System-only missions. Block IV will also introduce an improved anti-jam GPS receiver for enhanced mission performance.

The Navy and Raytheon have entered into a five-year multi-year procurement contract to replenish the Tomahawk inventory. Over 800 Block III Tomahawks were expended in Iraq and Afghanistan. The total buy is up to 2,200 missiles. Each missile will cost about \$729,000, down from the \$1.4 million each for the Block 3 Tomahawks, now in the fleet.

The Tomahawk cruise missile is the “weapon of choice” for engaging well-defended targets,” said Young. Tomahawks were first used at the beginning of Operation Desert Storm in 1990. They have been used in all conflicts since then. The missile is extremely accurate and has a 1,000-mile range. It hugs the earth and travels at 550 miles per hour. The missile can be launched from surface ships or submarines and carries a 1,000-pound warhead. ■

**With publication of this issue, the *Precision Strike Digest*, the official newsletter of the Precision Strike Association, goes quarterly. Future editions will grow from 12 to 16 pages, offering more news and feature articles regarding the issues and developments of most interest to the precision strike community.**

## News Briefs

### Air Force Spectre Gunship

Alliant Techsystems has received an \$8.8 million USAF contract to develop and evaluate a modified Mk 44 30mm automatic cannon on the AC-130U gunship.



Air Force Spectre Gunship

This will be the first time that the weapon is used on a fixed-wing aircraft. It is currently used on the

USMC's Advanced Amphibious Assault Vehicle. Northrop Grumman's Viper Strike system is also expected to be tested on the AC-130U, which already incorporates a side-firing cannon. ■

### Raytheon Completes JSOW Operational Test and Evaluation

Raytheon's unitary/penetration variant of the Joint Standoff Weapon (JSOW-C) has completed operational test (OT) firings with nine of 10 shots successful against a wide range of targets.

JSOW-C incorporates a Raytheon-developed uncooled, long-wave infrared seeker with automatic target acquisition algorithms, providing the Navy a launch-and-leave weapon with a long-range standoff precision strike capability.

JSOW-C will be the first U.S. weapon to incorporate the two-stage Broach blast fragmentation/penetration warhead, developed by the UK's BAE Systems. Thales provides the fuze. JSOW-C has a unique capability for a glide weapon in its ability to attack a hardened target in a near-horizontal mode.

Operational testing took place primarily at the Naval Air Systems Command's Pacific Land Range at China Lake, CA. Delivery began in September of the first production missiles ordered under a low-rate initial production contract.

JSOW-C was tested against a wide array of targets ranging from radar sites to caves and hardened bunkers including targets where concealment and other methods were used to attempt to deceive the missile. ■

### Airmen Use GBU-38 in Combat

The USAF recently conducted the first successful drop of two 500-pound GBU-38 bombs in combat.

Two F-16 Fighting Falcons performed a simultaneous GBU-38 release on the same target in central Iraq. The bombs precisely hit a two-story building with minimal collateral damage.

This was "a successful precision strike on a confirmed Abu Musab al-Zarqawi terrorist meeting," Coalition Press Information Center officials said. The introduction of the GBU-38 gives coalition leaders a smaller precision weapon.

Composed of a MK-82 with the joint direct attack munitions guidance system, the GBU-38 is considered a "lightweight" compared to most of the other munitions loaded on F-16s.

The accomplishment was soon matched by the USN, which also

See **News Briefs**, Continued on page 10

## PEOPLE

**Tina W. Jonas** has returned to the U.S. Department of Defense as the under secretary of defense (comptroller). She previously served as an assistant director and chief financial officer of the Federal Bureau of Investigation, a position she held since August 2002. Prior to that, Jonas served as the deputy under secretary of defense for financial management.

LTG **Benjamin S. Griffin**, USA, receives his fourth star with assignment as commanding general, U.S. Army Materiel Command. He had served as the Army's deputy chief of staff, G-8. VADM **Kirkland H. Donald**, USA, is promoted to admiral when he becomes director, Naval Nuclear Propulsion Program.

U.S. Army Lt. Gen. **James J. Lovelace, Jr.** is being reassigned as the Army's deputy chief of staff, G-3, while VADM **Lewis W. Crenshaw, Jr.**, USN, is promoted to vice admiral when he becomes deputy chief of naval operations for resources, requirements and assessments (N-8).

The U.S. Senate has confirmed the promotion of MG **Raymond T. Odierno**, USA, to lieutenant general with assignment as assistant to the chairman of the Joint Chiefs of Staff. He had served as commanding general, 4th Infantry Division (Mechanized), Fort Hood, TX.

Anteon has appointed USAF Lt. Gen. (Ret.) **Richard E. Brown** as group senior vice president, Air Force Programs. **R. James Woolsey** has joined the board of advisors of BioDefense Corp. Retired USN RADM **Robert C. Williamson** has joined Raytheon's Network Centric Systems as director, naval integration and transformation. Former Marine aviator **Mark Gibson** is appointed Bell Helicopter's vice president for advanced concept development.

## News Briefs, Continued from page 9

dropped its first two 500-pound JDAMs during combat operations in Iraq. The weapons destroyed the unnamed target where insurgents were known to be operating in Iraq.

The GBU-38 completed its initial operational evaluation in September,



Unloading a GBU-38 from an F-16 at a forward-deployed location.

resulting in an early operational capability a month later and eight months ahead of its scheduled initial operational capability. Navy JDAM Program Manager Capt. Dave Dunaway says "the 500-pound JDAM is perfect for urban warfare." ■

## CALENDAR OF EVENTS

### Winter Roundtable

**Date:** January 26, 2005

**Theme:** "The Way Ahead for QDR 06 and Precision Strike"

**Location:** Crystal Gateway Marriott, Arlington, VA

### Annual Programs Review

**Date:** April 19-20, 2005

**Location:** The Hilton Crystal City at Ronald Reagan National Airport, Arlington, VA

For more information on these events, and other activities please contact the PSA office directly.

Precision Strike Association, 2111 Wilson Blvd - Suite 400, Arlington, VA 22201-3061  
tel: 703-247-2590 fax: 703-527-5094  
e-mail: [info@precisionstrike.org](mailto:info@precisionstrike.org)  
website: [www.precisionstrike.org](http://www.precisionstrike.org)

## United Defense Defeats RPGs

United Defense Industries says its Close-In Counter Measure (CICM) active protection system successfully intercepted and destroyed incoming Rocket Propelled Grenades (RPGs) during end-to-end testing at the U.S. Army's Redstone Technical Test Center at Redstone Arsenal, AL.

This successful counter-RPG development was accomplished in less than nine months through targeted research and development and rapid prototyping. The firm is offering the CICM system to the U.S. military as a force protection measure.

United Defense has teamed with BAE Systems, Applimotion, Vista Controls, Pacific Scientific Energetic Materials and CTC. The CICM system uses a variety of innovative technologies, including passive



RPG test firing

cueing sensors, low-cost tracking radar, a compact high-speed launcher, lightweight and precise non-bursting countermeasure, and new Nickel-Metal-Hydride batteries to supply pulse power.

Meanwhile, Metal Storm has taken the lead role in a U.S. Navy program to develop a system to defeat RPGs.

Metal Storm aims to design and demonstrate the feasibility of producing an RPG defense system that integrates Metal Storm's electronic ballistics technology with a sensor, mount and fire control system made by Northrop Grumman.

Phase I of the program aims to develop the system concept, and will

span a six-month period that began in August. If successful, the program would then proceed to Phase II, during which a demonstrator system would be developed. ■

## Boeing Develops MOP

Boeing has been tapped to design and test a Massive Ordnance Penetrator (MOP) to penetrate and destroy hardened and deeply buried targets.

The Air Force Research Laboratory awarded Boeing a \$20 million contract for the R&D effort. The MOP will be guided, weigh up to 30,000 pounds and be carried internally on the B-2 and B-52 bombers. The MOP would surpass the 21,000-pound Massive Ordnance Air Burst (MOAB) weapon developed for use in Iraq but not used. ■

## Navy Retires AIM-54 Phoenix Missile

After 30 years of service, the U.S. Navy is retiring its first long-range air-to-air missile, the AIM-54 Phoenix. The U.S. Navy's F-14 Tomcat is the only operational aircraft that carried the weapon.

The AIM-54 Phoenix was the first radar-guided air-to-air missile that could be launched in multiple numbers against different targets from an aircraft, making the Phoenix the Navy's main fleet air defense long-range weapon. ■



F-14 fighter fires Phoenix missile

Mark your calendar for...

**WEDNESDAY, 26 JANUARY 2005**

When PRECISION STRIKE ASSOCIATION presents

## **WINTER ROUNDTABLE 2005**

CRYSTAL GATEWAY MARRIOTT  
Arlington, VA

### **Theme: The Way Ahead for QDR 06 and Precision Strike**

*Gain insight into how the precision strike community should plan to address and meet the future key security challenges facing the United States. Highlight of the day—presentation of the prestigious William J. Perry Award.*

#### **Keynote:**

**Honorable Ryan Henry**—Principal Deputy Under Secretary of Defense for Policy

#### **Select topics by other confirmed & invited speakers:**

- **New Administration & Congress:** Peter Huessy—NDU Foundation
- **Congressional Perspective:** Rep Curt Weldon—PA, 7th District (invited)
- **National Military Strategy:** CAPT Jeff Hesterman USN—The Joint Staff (J-5)
- **Experimentation Strategy:** MG John Wood USA—USJFCOM (J-9)
- **Joint Concept Development:** Colonel Patrick Shaw USAF—The Joint Staff (J-7)
- **Distinguished Remarks:** Dr. Bill Perry—Former Secretary of Defense
- **Congressional Panel:** SASC, SAC, HASC, HAC—Professional Staff Members
- **Systems & Mission Integration:** Dr. Glenn Lamartin—OUSD(AT&L)
- **Warfighters' Strategy Roundtable—Policy Implications for the Future of Precision Strike Weapons:** QDR Leaders—Military Departments

**Ryan Henry**, Continued from page 1 one of those responsible for drafting the next Quadrennial Defense Review (QDR). Under Secretary of Defense Donald Rumsfeld's guidance, military and civilian leaders in the Pentagon already have begun discussion and advance work on QDR 06. At Winter Roundtable 2005, Mr. Henry will highlight the objectives of QDR 06, sharing his thoughts with the precision strike community on what we should do to meet future security challenges.

Further, each of the U.S. military services has put in place a dedicated staff to work on the new QDR and

has appointed a senior officer to spearhead the effort. PSA has invited these QDR directors to participate in a Warfighters' Strategy Roundtable on Policy Implications for the Future of Precision Strike Weapons.

Additionally, we will honor the warriors of Operation Enduring Freedom and Operation Iraqi Freedom, presenting them with the ninth annual William J. Perry Award during a luncheon ceremony. The award recognizes significant contributions regarding precision strike systems. ■

## **PRECISION STRIKE ASSOCIATION CORPORATE MEMBERS**

### **GOLD**

Aerojet Corporation  
Alliant Techsystems  
Applied Research Associates  
BAE Systems Mission Solutions  
Ball Aerospace & Technologies  
Barr Associates, Inc.  
EDO Corporation  
General Dynamics  
Honeywell International  
Kaman Aerospace  
L-3 Communications Corporation  
L-3 Government Services, Inc.  
Lockheed Martin Corporation  
MBDA  
Northrop Grumman Corporation  
Northrop Grumman Mission Solutions, Inc.  
QinetiQ  
Raytheon Company  
Rockwell Collins  
Science Applications Int'l Corporation  
Smiths-Aerospace  
Southeastern Computer Consultants  
Taurus Systems  
Teledyne Continental Motors  
Textron Inc.  
The Boeing Company  
Whitney, Bradley & Brown, Inc.

### **SILVER**

CarterCopters, LLC  
Chugach Support Services  
Software Engineering Associates, Inc.  
Ultra Electronics

### **BRONZE**

BAE Systems RO Defense  
BF Goodrich Aerospace  
Raytheon Technical Services  
Science Applications Int'l Corporation

# Membership Application – Precision Strike Association

I hereby apply for membership in the Precision Strike Association. My understanding is this entitles me to invitations to appropriate Association activities, the bimonthly 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.*

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**  
2111 Wilson Blvd - Suite 400  
Arlington, VA 22201-3061

PRSR STD  
U.S. Postage  
**PAID**  
Permit #20  
Leonardtown, MD  
20650