The Precision Strike Digest

2nd Quarter 2005
Vol.18, No.2

"Dedicated to advancing the art and science of precision engagement concepts and technology"

PSA
PRECISION STRIKE ASSOCIATION
Affiliate, National Defense Industrial Association

VISION STATEMENT

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

Summer Forum to include PEO for Weapons

MG Robert Chedister, USAF

The Precision Strike Association (PSA) will host their PEO Forum on 27-28 July 2005 in Ft. Walton Beach, FL. With the theme *Precision Engagement-Creating Effects Based Operations for Future Battlefields*. The unclassified forum will explore the U.S. military's current and future precision strike capabilities and joint developments across the services.

Brigadier General James P. Hunt, USAF, the new deputy director for force application, J-8 Force Structure, Resources & Assessment Directorate, The Joint Staff, is set to address the Joint Staff's vision regarding future joint precision engagement operations. CDR Mark Bowman, USNR, will follow on the podium, discussing joint precision engagement requirements.

Precision engagement remains the main topic of discussion over the two days with representatives from the U.S. Air Force, U.S. Army, U.S. Navy and U.S. Marine Corps offering perspectives on their services' precision strike strategies and programs. Randy Bigum, vice president, strike weapons, Lockheed Martin Missiles and Fire Control, will offer industry's point of view on the subject. (More details on the program can be found on page 15.)

Our keynote speaker for day two of the forum and our conference host will be Maj. Gen. Robert Chedister, Air Force Program Executive Officer for Weapons, and Commander, Air Armament Center, Air Force Materiel Command, Eglin AFB, FL.

Born in Hazen, AK, he entered the U.S. Air Force in 1972 upon graduation from the University of Arkansas. During a distinguished career spanning 33 years, he has served as a test squadron commander, deputy commander of operations for a test wing, systems program director for a major weapons system, and test center commander. MG Chedister is a command pilot with more than 3,000 flying hours.

PSA's fourth major annual event is part of an effort to broaden the visibility of PSA beyond the Washington Beltway. It is designed to educate government officials, industry, academia and the public on the benefits of precision strike. The initial Precision Strike Summer PEO Forum took place at Patuxent River Naval Air Station, MD. Last year's Summer event was held in Huntsville, AL.

Mark your calendars now and plan to join your colleagues at this unique PSA event. ■

IN THIS ISSUE

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Chairman's Column

In Need of Support

I would like to thank all those who attended the Annual Programs Review (APR) 19-20 April 2005. I also offer a very special thanks to the corporate sponsors of the event.

On behalf of the entire association a sincere well done to the APR Committee: Ginny Sniegon; LTC Ken Britt, USA (Ret); Maureen Koerwer, CAPT Scott Swift, USN; CDR Cathal O' Connor, USN; COL Lance Moore, USA; CAPT Vic Steinman, USN; Col John Croghan, USAF; Maj Chad Stevenson, USAF; Dawn Campbell and MG Paul Greenberg, USA (Ret). These events would not take place without much hard work.

I believe it was a resounding success from a venue and agenda standpoint. But attendance for the APR and other Precision Strike Association (PSA) events earlier this year have been down slightly. I think this can be attributed (somewhat) to a scheduling conflict with our technology event in October. But we also face competition from an increasing number of 'for profit' events.

PSA is a non-profit organization created for educational and scientific purposes. We cover costs through event attendance fees and minimum membership dues. We offer top-notch speakers at a very reasonable cost to attendees. We will continue to provide good value, and we hope you consider this as you decide which events you need to attend this year.

Look at our agenda for the Summer PEO Forum 27-28 July 2005 at Fort Walton Beach, FL. We have a great lineup of speakers and the support of the local precision strike community. We need a full house. Check if your colleagues might also be interested in attending.

Please join me in welcoming our new and re-elected PSA Board of Directors: George M. McVeigh, Jr., SAIC; Alan Pickard, MBDA; LtCol Michael T. Sheerin, USMC; Dale Spencer, Kaman Aerospace; LtCol Christopher St. George, USMC, (CNO N780C8); CAPT Vic Steinman, USN, (OPNAV); CAPT Scott Swift, USN, (OSD); Tom Weller, Raytheon; and, Dick Wright, SeiCorp.

Been following the BRAC? The DoD base closing recommendations are now out. Some people see a "perfect storm" on the horizon involving the BRAC, the Quadrennial Defense Review, and formulation of the Fiscal Year 2007 defense budget and 2008 POM.

Precision engagement systems will certainly feel the impact of these ongoing activities. For example, the BRAC proposes major consolidation of weapon development and testing activities at three specific locations. Makes sense, but who would have guessed it a year ago?

Stay tuned. We may not be able to accurately predict the full outcome of a perfect storm. But we hope to keep everyone as well informed as possible.

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

Wayne F. Savage
Chairman of the Board
Precision Strike Association

Annual Programs Review Roundup

The Precision Strike Association (PSA) held its 2005 Annual Programs Review (APR) on 19-20 April at the Hilton Crystal City, Arlington, VA. The APR focused on precision strike weapons systems and capabilities—particularly those in development and being procured.

This year's APR theme *Precision Strike–Interdependency Across the Services* examined the concepts of interoperability as it relates to precision strike and the reasons for the substantial progress that has been made.

Leading off the first day of the APR was USN RADM Timothy L. Heely, PEO for Strike Weapons and Unmanned Aviation. The theme of his opening remarks was "interdependence across the services." He highlighted weapons and UAV roadmaps that leverage an investment strategy employing fiscal cooperation, joint development, joint employment and capabilities-based acquisition planning. He believes "the time for interoperability and interdependency is here."

Attendees were then treated to a keynote address from Major General Joseph F. Peterson, USA, vice director for operations, J-3, The Joint Staff. He discussed the operational criteria by which joint force requirements are currently defined.

"Achieving the objectives of protecting the U.S. homeland, preventing conflict and surprise attack, and prevailing against adversaries (when required) within an uncertain and complex threat environment requires a capabilities-based approach that focuses less upon a specific adversary or the region in which conflict may occur and more upon the manner in which an adversary will fight.

"The diverse and formidable threats posed by adversaries, especially those possessing weapons of mass destruction, require the U.S. to shape the security environment in ways that enhance multinational partnerships, deter aggression and set the conditions for success if deterrence fails. The maturity and uncertainty of today's potential adversaries mandate our need to plan with surprise in mind and to contend with uncertainty," Peterson believes.

"Effective global strike designed to damage, neutralize or destroy time-sensitive and time-critical enemy targets, or deny the sanctuary of rapidly mobile rogue adversaries, requires persistent surveillance and precision strike…The hallmarks of future strike forces must be full-spectrum lethality, standoff access, and prompt response, supported by effects-based planning tools and adaptive planning methodologies," Peterson added.

The Precision Attack to Ensure Dominant Maneuvers Panel was chaired by LTC Ken Britt, USA (Ret), who along with EDO's Maureen Koerwer, served as the Annual Programs Review Event Chairs. Updates were offered on various major U.S. Army precision strike weapons developments. Panel members included: LTC Bill Cole, USA, Deputy PM, Combat Ammo System (Excalibur); Rod Summers, (PM, NLOS Launch System); and, LTC Steve Lee, USA, (PM Guided MLRS Unitary).

U.S. Army PM LTC John Oxford described the Viper Strike weapon, which now arm Hunter unmanned aerial vehicles (UAVs) deployed in Iraq. The 48-pound precision munition, which uses a semi-active laser seeker, was developed as a derivative of the BAT submunition. The weapon is designed for operations that require a steep angle of attack, requiring someone to lase the target.

The first day's luncheon speaker was Harry E. Schulte, vice president, strike systems, Raytheon Missile Systems, who spoke of the need for persistent intelligence, surveillance and reconnaissance (ISR) and targeting across the effects chain. He believes persistence needs to be affordable, autonomous, responsive and precise.

David W. Duma, acting director, Operational Test and Evaluation, OSD, kicked off the afternoon session, discussing how precision strike weapons are being tested. He said weapons testing must be "operationally realistic and tested against 'smart' opposing forces".

USAF Col (S) West "Elvis" Anderson then briefed on the precision strike capabilities of the Rockwell International B-1 Lancer bomber, which continues to be modernized. A B-1 pilot since 1989, Anderson graphically described how the B-1 was employed in Operations Enduring Freedom and Iraqi Freedom.

A highlight of the Annual Programs Review was the Warfighters' Strategy Panel on the Quadrennial Defense Review (QDR), which was rescheduled from the 26 January Winter Roundtable.

USN CDR Cathal O'Connor from the Joint Staff's J-8 office moderated a flag and general officers panel consisting of four QDR leaders from the military departments who presented their particular

See **Wrapup,** Continued on page 4

Wrapup, Continued from page 3

service's perspective. The panel consisted of (in order of presentation) BG (P) Robert E. Durbin, USA, RADM Patrick M. Walsh, USN, Brig Gen Taco Gilbert, USAF, and MajGen Emerson N. Gardner, USMC.

In leading off the discussion, Army BG Durbin stated that the Army's approach to the QDR is yet to be defined. He admitted that the Army had moved off center in reference to the future spiral capability of the Family of Combat Systems.

Durbin was involved with the first preparation of the Army QDR in early August 2003. Durbin mentioned that Army Chief of Staff General Schoomaker has added three new focus areas to the earlier list of 16 relating to the need to be more adaptable in an irregular manner, more adaptable and flexible in a stability manner, and to be more capable for homeland defense. He questioned the right mix of capabilities. The Army is moving towards joint de-confliction and interdependency. The Army's objective is to take one-step further to joint synergy.

Next, Navy RADM Walsh noted that QDR 05 is a continuation of QDR 01. He focused on questions pertaining to how to resource the recently published National Defense Strategy and how to deal with challenges related to adaptability as we look at future resources. He also reflected on the desires of the U.S. related to joint coalition interoperability and strategic forces as addressed in the National Defense Strategy and the National Military Strategy.

Walsh noted that there would be a continuing demand for accuracy in precision strike systems and that we would need to focus on post Cold War and homeland defense engagement strategies such as less collateral damage as we conduct a comprehensive review in the precision arena.

USAF BG Gilbert said that the QDR has dual focus. The near term will focus on the global war on terrorism and the far term (20 years) is important because of the future total capability force. He noted that the Air Force is concentrating on modernization and recapitalization. The Air Force is going to be capabilities-based and focus on effects.

Gilbert stated that precision engagement is an essential piece in this age of interdependency, reflecting on the development of laser- and GPS-guided weapons and advanced data links. Gilbert noted that we have to continue to make improvements and invest more in 'soft' capabilities as well as look at disruptive capabilities of precision strike such as GPS jamming. Precision will be at the heart of everything, he believes.

USMC MajGen Gardner stated that he was looking for answers to challenges—particularly in the urban operation—since that will be the future. Gardner asked if we have optimized ourselves for future precision investment and wondered if we are over-relying on technology, e.g., science instead of state-of-war. He further noted that the touchstone is an effective individual Marine and smaller units to push capability further down.

The initial objectives are to prevent wars, be active in places where war erupts, and to develop effective warfighting force languages and cultural skills. Gardner believes that the QDR is a tremendous challenge as the DoD determines how to answer the hard questions, the associated metrics, and how to assess future capabilities.

PSA's Annual Meeting & Reception, which included great food, fine wine and special remarks, closed out the first day's activities.

The APR's second day focused on sessions related to a review of current and future precision strike weapons systems. They were moderated by some of PSA's military technical chairs, including Colonel John Croghan, USAF, and Captain Vic Steinman, USN.

These sessions represent a fundamental element of the Precision Strike Annual Programs Review and are very popular with the participants.

USAF Col Croghan kicked off the Joint Deep Strike Systems session. Presenters included the JASSM briefer, USAF Col James Geurts (JASSM PM); ATACMS briefer, COL Earnest Harris, USA, ATACMS PM); Tomahawk briefer, CAPT Bob Novak (PMA-280); and, Network Centric Weapon ACTD, Linda Rutledge (NCW PM).

This year's Sea Strike Systems Panel, chaired by Navy Captain Steinman, focused on weapons in the GiG (FORCENET). Panel members returning from 2004's APR Sea

See **Wrapup,** Continued on page 5

Wrapup, Continued from page 4

Strike Capabilities Panel were: USN CAPT David Dunaway (PMA-201), USN CAPT Bob Novak (PMA-280) and USMC LtCol Chris St. George (N780C8). USN CDR Larry Egbert (Deputy PMA-242) substituted for his boss, USN CAPT Mark Converse. USN CAPT MARK Guadagnini (CVW-17) rounded out the panel.

The second day's luncheon speaker was USMC LtGen Michael A. Hough, deputy commandant for aviation, USMC Headquarters. Soon to retire from active duty, Hough said a key enabler of precision strike is command and control. He defines precision "as a warhead on a forehead."

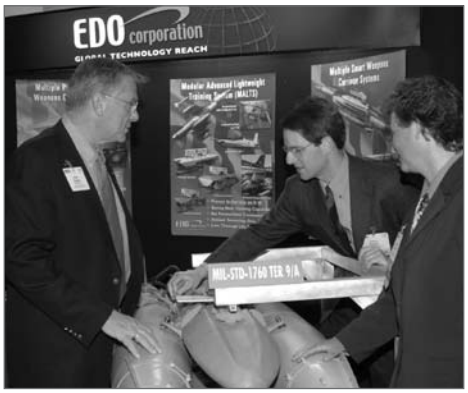
Hough believes the U.S. military still requires better situational awareness. "We need to drive down response time while compressing the kill chain," he said. He also believes "urban operations require greater precision."

General Benjamin S. Griffin, USA, commanding general, U.S. Army Materiel Command, presented the second day's keynote address, presenting his ideas regarding the Army's role in an interdependent environment.

Rounding out this year's APR was the Precision Strike Acquisition Panel moderated by CAPT Scott Swift, USN, PSA Programs Vice Chair. The panelists were: BG(P) Jeffrey Sorenson, USA (deputy for acquisition and systems management); RDML (S) Rick Wren, USN, Aviation & Aircraft Carrier Plans & Programs (N-780); Judy A. Stokley, deputy for acquisition, Air Armament Center, Eglin AFB, FL; Diane Wright, OUSD(AT&L) Defense Systems, Air Warfare Director; and, the National Geospatial-Intelligence Agency's Scott Robertson. ■

APR 2005 Exhibitors

Judy Stokley in the USAF booth



EDO provides bomb racks

USMC LtGen Hough with Kaman exhibitors

PM Combat Ammunition Systems at the APR

Raytheon returns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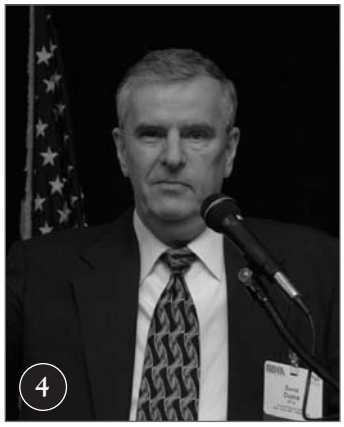
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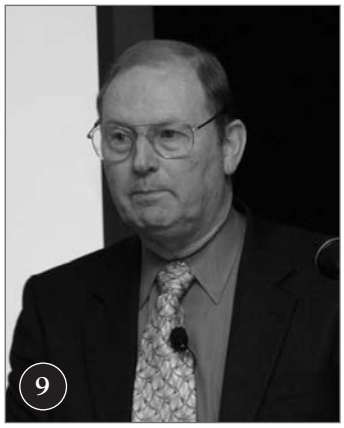
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Precision Strike APR

Precision Strike Association would like to thank everyone who helped make this event a success


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1 ***Rear Admiral Timothy L. Heely, USN***
PEO for Strike Weapons and Unmanned Aviation

2 ***Major General Joseph F. Peterson, USA***
Vice Director for Operations (J-3), The Joint Staff

3 ***Harry E. Schulte***—*Vice President Strike Systems Raytheon Missiles Systems*

4 ***David W. Duma***—*Acting Director, Operational Test and Evaluation, OSD*

5 ***LTC Bill Cole, USA***—*PM, Excalibur,* ***LTC Ken Britt, USA (Ret)***—*PSA Board Member & Event Chair,* ***LTC John Oxford, USA***—*PM, Viper Strike,* ***LTC Steve Lee, USA***—*PM, Guided MLRS Unitary,* ***Rod Summers***—*PM, NLOS-LS*

6 ***Lt Col West Anderson, USAF***—*Student, National War College*

7 ***Jon Estridge***—*InnoVision Directorate, Targeting & C4ISR Division Chief, National Geospatial-Intelligence Agency (NGA)*

8 ***LtGen Michael A. Hough, USMC***—*Deputy Commandant for Aviation United States Marine Corps Headquarters*

9 ***Raleigh Durham***—*Deputy Director for Joint Force Application, OUSD (AT&L)/DS*

10 ***Cdr Cathal O'Connor, USN***—*PSA Board Member,* ***BG (P) Robert E. Durbin, USA***—*Director, Army QDR;* ***RADM Patrick M. Walsh, USN***—*Director, Navy QDR Support Office,* ***Brig Gen Taco Gilbert, USAF***—*Deputy Director, Air Force Strategic Planning Directorate,* ***MajGen Emerson N. Gardner, USMC***—*Director, USMC QDR*

11 ***Gen Benjamin S. Griffin, USA***—*Commanding General, U.S. Army Materiel Command*

12 ***Col James Geurts, USAF***—*JASSM PM,* ***Col Earnest Harris, USA***—*PM, Precision Fires Rockets & Missiles, PEO Space and Missiles Command,* ***Linda Rutledge***—*NCW PM,* ***CAPT Bob Novak, USN***—*PMA-280,* ***Col John Croghan, USAF***—*PSA Board Member*

13 ***Capt Scott Swift, USN***—*OUSD (AT&L) Defense Systems,* ***RADM (S) Rick Wren, USN***—*Aviation & Aircraft Carrier Plans & Programs(N-780),* ***Judy Stokley***—*Deputy for Acquisition, Air Armament Center, Eglin AFB,* ***Diane Wright***—*OUSD (AT&L) Defense Systems, Air Warfare Director, BG(P)* ***Jeffrey Sorenson, USA***—*Director, Systems Management & Horizontal Technology Integration,* ***Scott Robertson***—*Director, Future Warfare Systems Office, National Geospatial-Intelligence Agency (NGA)*

14 ***CAPT Bob Novak, USN***—*PMA-280,* ***Capt Vic Steinman, USN***—*PSA Board Member,* ***CAPT David Dunaway, USN***—*PMA-201,* ***CAPT Mark Guadagnini, USN***—*CVW-17,* ***CDR Larry Egbert, USN***—*PMA-242,* ***LtCol Chris St. George, USMC***—*N78*

Transformational Navy Capabilities Deliver Precision Strike From the Sea

The U.S. Navy's new long-range precision missiles and guns will sail aboard transformational platforms to conduct strike missions from the sea.

The new Block IV variant of the Raytheon Tomahawk cruise missile, with a range of 1,000 miles, can reach a target area and loiter until a target is assigned. Also known as Tactical Tomahawk, the missile can be reprogrammed while in-flight, striking any one of 15 pre-programmed alternate targets. The missile can also be redirected to any Global Positioning System (GPS) target coordinates. The Tactical Tomahawk weapon is not only more capable, but it costs about half as much as previous Tomahawk versions.

The Navy's future multi-mission destroyer, DD(X), will feature a revolutionary new gun, called the Advanced Gun System (AGS). This highly-automated 155mm (6.1-inch) gun will fire GPS-guided, rocket-assisted Long Range Land Attack Projectiles (LRLAP) at targets up to 100 nautical miles away, with a sustained rate of fire of up to 10 rounds per minute. By comparison, the maximum range of the 5-inch/54 caliber Mk 45 naval gun currently used in the fleet is 13 nautical miles.

In addition to the considerable range advantage over current naval guns, "AGS has a Multiple Round Simultaneous Impact (MRSI) capability to coordinate simultaneous delivery of multiple rounds," says John Perry, of United Defense, the company that builds AGS. "You can fire six rounds, one right after the other, at the same target, with slightly different trajectories so each round impacts the target at the same moment."

Multiple rounds can be fired simultaneously at targets up to 75 nautical miles away.

The gun and magazine will be completely automated. Its water-cooled barrel enables a high and sustainable rate of fire.

AGS is one of the DD(X) Engineering Development Models (EDMs). The first AGS installation on DD(X) is planned for FY 2008, and will achieve its initial operating capability (IOC) in 2013. LRLAP completed two successful guided flights at Point Mugu in January and February 2005. Integrated gun mount and magazine testing are scheduled for Summer 2005 at Dugway, Utah.

Artist's rendering of DD(X)

Naval Surface Fire Support (NSFS) provides critical long-range precision firepower from the sea for fast-moving expeditionary forces and joint forces ashore. Naval fires complement and augment the capabilities of the Marine Air Ground Task Force (MAGTF), providing essential target destruction, neutralization, harassment, interdiction, and suppression and creating smoke screens. The range and capabilities of these new naval guns will allow for the preparation of the battlefield before expeditionary forces arrive, and will deliver rapid and accurate close support once they have arrived.

The AGS-equipped DD(X) will complement the towed M198 howitzer, now in-service with the U.S. Army and U.S. Marine Corps, and the Army's M109 tracked howitzer. Indeed, the Navy's selection of the 155mm gun was made with an eye toward ordnance family commonality.

The DD(X) will be able to defend itself against current and projected surface and undersea threats while projecting power ashore. It will have a capability optimized for the littoral, while presenting just one-fiftieth the radar cross section as an Arleigh Burke.

"The DD(X) is critical to the Navy's future," says Chief of Naval Operations Admiral Vern Clark. "Our future cannot unfold without it. DD(X) is the heart of our Family of Ships." ■

"Virtual Integration Facility" Simulates DD(X) AGS

United Defense has developed a Virtual Integration Facility (VIF) at Fridley, MN to design, develop and test the Advanced Gun System (AGS) for the U.S. Navy. AGS will be the main gun aboard the future DD(X) destroyer.

The VIF uses three commercial off-the-shelf PC computers to create a ship and gun environment that can be operated in realistic situations, providing engineers the opportunity to work with a virtual prototype of their design long before the first hardware is produced.

"The entire ship is modeled, so that ship movement, wave motion and the underway environment is faithfully reproduced," says United Defense's John Perry. "This is an end-to-end real-time simulation of the AGS. We call it an Operational Virtual Prototype. The AGS is embedded in the virtual DD(X), providing us with a system integration test bed. It allows for rapid prototyping and integration of both software and hardware designs."

The use of mockups, scale models, and computerized modeling and simulation (M&S) reduces the risk involved in developing, building, and testing new combat systems. With M&S, training is more available, effective, and realistic. New rules of engagement and future concepts of operations can be validated today. Evaluating system performance on a test range allows for a "single point test," valid for the environmental conditions on that given day. M&S can allow for a full range of simulated conditions, such as humidity, heat, wind, and other variables.

New simulation tools are helping designers, engineers and users simulate integrated software, hardware and human operators in a realistic tactical-scenario environment.

The VIF allows for multiple engagement scenarios. The DD(X) carries two AGS systems, designated Mounts 61 and 62 each with a magazine carrying approximately 300 LRLAP rounds, as well as 20 Mk 57 Advanced Vertical Launch System four-cell modules. DD(X) also has two 57mm Mk 110 naval guns for close-in defense. The Mk 110 has a rate of fire of 220 rounds per minute, with 120 rounds carried in each mount, which are normally fired in three to five-round bursts. When conducting a simulation, Perry is able to designate any of the DD(X) weapons to engage selected targets.

The virtual hardware includes recoil models, thermal models, electric drive motion and power models, and reliability models. The VIF let's Perry and his team run the system to find sequencing logic faults and potential hardware collisions.

"No where at any land base is the entire objective AGS system brought together prior to ship construction. This is it," Perry says.

The VIF looks like a theater, with a wrap-around screen. The simulations can be displayed in many aspects, and can be run in real time or at higher or slower speeds. The VIF is driven by three laptops, which can be transported to an off-site location as needed. ■

The U.S. Navy's new DD(X) will be a multi-mission destroyer. In addition to two Advanced Gun System (AGS) 155mm guns, it will have 80 Vertical Launch System (VLS) cells to carry a variety of defensive and strike weapons. At 14,000-tons, DD(X) will be significantly larger than an Arleigh Burke-class DDG. But unlike the DDG, with its 320 crewmembers, DD(X) will require a crew less than half the size.

In May 2002, the USN awarded Northrop Grumman Ship Systems the lead contract to engineer and design the revolutionary warship. Other companies on the DD(X) National Team include Raytheon, United Defense, General Dynamics and Lockheed Martin. They have successfully completed over a dozen incremental design review milestones.

Raytheon recently received a $3 billion contract to develop standardized, interoperable combat systems for the DD(X). Also awarded was a $376 million contract to United Defense to continue development of the AGS for the next-generation naval combatant.

News Briefs

Excerpts of Remarks by President Bush at USNA Commencement May 27, 2005 Annapolis, MD

President Bush

To meet the threats of the 21st Century, we are developing new technologies that will make our forces faster, lighter, more agile, and more lethal.

Since taking office, my administration has invested $16 billion to build transformational military capabilities. We've requested an additional $78 billion for these efforts over the next four years. We've invested $240 billion in research and development, so we can build even more advanced capabilities in the decades ahead. We requested $275 billion for these efforts over the next four years. These investments will help us keep the peace by redefining war on our terms.

In the 1991 Persian Gulf War, aircraft taking off from a carrier deck could engage about 200 targets per day. In Operation Iraqi Freedom, that number jumped to over 600 targets a day. And those capabilities are becoming more and more precise. In Iraq, we used a new Hellfire missile for the first time, which can take out enemy fighters hiding on one floor of a building, without destroying the floors above and below. This missile is capable of reaching around corners to strike enemy forces that hide in caves, and bunkers and hardened multi-room complexes. In the coming years, there are going to be some awfully surprised terrorists when the thermobaric Hellfire comes knocking.

Revolutionary advances in technology are transforming war in our favor. And in the decades ahead, the changes will be even more dramatic. We will deploy unmanned underwater vehicles that can go where no submarine can go today. We will deploy advanced destroyers capable of shooting down ballistic missiles, and transformed strike submarines that can silently carry special operation forces and cruise missiles within striking distance of our adversaries. We are developing joint sea bases that will allow our forces to strike from floating platforms close to the action, instead of being dependent on land bases far from the fight.

Transformation requires more than high-tech weapons – it requires creativity, ingenuity, and a willingness to try new things. All the advanced technology in the world will not transform our military if we do not transform our thinking. ■

Sappers Become IED Hunters in Iraq

When soldiers conduct convoys in Iraq, they try to watch out for and stay far away from improvised explosive devices or IEDs.

For the Sappers of Company B, 65th Engineer Battalion attached to Task Force 1- 27 Infantry, 2nd Brigade Combat Team, it's a little different. When the Sappers perform route clearances, their intent is to hunt down these IEDs and make sure they get destroyed.

Route-clearance missions are carried out daily inside Task Force 1-27's area of operations. "The main thing about the route clearances is ensuring that the (multinational forces) can use the main supply routes safely and also to help out the civilians. We make sure no one gets hurt or hit by an IED," said Army Staff Sgt. Earl Mendoza, a squad leader with the unit.

To find IEDs, the Sappers drive in the middle of the roadway at about 10 to 15 miles per hour. If something looks suspicious along the roadway, they stop and investigate. Disturbed dirt and trash with wires or antennas protruding from it are other things they look out for along the roadside.

When the Sappers do find an IED, they secure the area, look for secondary explosive devices, find the triggerman and call explosive ordnance detachment personnel, who either disarm the IED or destroy it.

Unfortunately, being in harm's way has taken a toll on the Sappers. "There have been times where we've found IEDs the hard way," Mendoza said. "We've been lucky only to have very minor injuries." ■

Airmen keep B-2 Spirits Safe

The Northrop Grumman B-2 Spirit bomber's capabilities to penetrate an enemy's most sophisticated defenses and threaten its most heavily defended targets depend on airmen who help maintain the aircraft's stealth characteristic.

Mechanics of the 509th Maintenance Squadron's low observable section apply sheets and strips of radar-absorbent coating on the jet. The majority of the airmen are aircraft sheet metal technicians who said they did not know what to expect when they first arrived at Whiteman AFB, Missouri.

"I was ready to put my metals technology skills to test," said Senior Airman Bruce Vaughn. But he was surprised to discover that the aircraft

is made of composite materials—strong lightweight fibers bonded together chemically, reducing the overall weight of the aircraft. It also helps to make the B-2 difficult to detect, track and engage.

The sheet metal specialist had to learn a new set of skills to qualify as a low observable technician. Maintaining and repairing the LO capabilities of the B-2 Spirit is a slow, lengthy and difficult process.

After a stealth aircraft flies, maintainers must perform safety inspections and weekly assessments. They repair tiny dings and scratches that increase the planes radar signature. The B-2 uses an anti-radar system that depends on a smooth

B-2 Stealth Bomber

outer skin. That, in turn, requires that the usual access panels must be covered with tape and special paste to make it smooth.

Unlike when using sheet metal, where tolerances are more forgiving, here the gaps have to be almost perfect.

And unlike B-1 and B-52 bombers that have active defensive countermeasures like flares and chaff, the B-2's only defense is its stealth characteristics. Squadron airmen have to be more critical when working on the jet to ensure it is picture perfect.

Boeing Center Offers Better Network-Centric Analysis

Boeing recently completed a $4.5 million expansion of its Modeling Simulation and Analysis Center (MSAC) in Philadelphia, providing military customers with a state-of-the-art simulation environment supporting design and product integration.

The expansion will offer the latest modeling and integration capabilities for a variety of Boeing programs, including the U.S. Army's Future Combat Systems (FCS).

The expanded MSAC merges multiple government, industry and FCS laboratories into a single network environment of equipment and facilities across the country. That environment will allow Boeing, its industry partners and military customers to host multiple, simultaneous integration exercises through-

Boeing's MSAC Center

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PEOPLE

John D. Negroponte has become the nation's first national intelligence director. USAF Lt. Gen. **Michael V. Hayden** is serving as principal deputy intelligence director. Congress created the director of national intelligence position last year. The DNI is now the nation's top official responsible for intelligence operations.

Gordon R. England, formerly the secretary of the navy, has taken over the duties of deputy secretary of defense, succeeding **Paul Wolfowitz** who is now the World Bank president.

President Bush has nominated Gen. **Peter Pace** as the first U.S. Marine to serve as chairman of the Joint Chiefs of Staff. Pace is currently the vice chairman. If confirmed by the Senate, Pace will succeed Air Force Gen. **Richard B. Myers** when he steps down in September. The president also nominated Navy Adm. **Edmund Giambastiani Jr.** to serve as vice chairman. Giambastiani currently serves as the commander of U.S. Joint Forces Command.

President Bush has announced his nomination of Gen. **T. Michael Moseley** as chief of staff of the Air Force, succeeding Gen. **John P. Jumper**. Moseley is currently the vice chief.

The White House intends to nominate **Eric S. Edelman** to succeed **Douglas J. Feith** as undersecretary of defense for policy. Edelman, a career foreign service officer, is U.S. ambassador to Turkey and previously served as principal deputy assistant to the vice president for national security affairs.

Kenneth J. Krieg has been confirmed and commissioned by the President to be the Under Secretary of Defense (AT&L), replacing **Michael Wynne**. **Brad Berkson** will assume Ken's former position as Director, Program Analysis and Evaluation.

Army Lt. Gen. **William S. Wallace** earns his fourth star with assignment as commanding general, U.S. Army Training and Doctrine Command. USMC Lt. Gen. **Robert Magnus** has been nominated for appointment to the rank of general and assignment as the assistant commandant of the Marine Corps.

President Bush has nominated Air Force Brig Gen **Kevin J. Kennedy** to the rank of major general, the deputy director of ISR, Deputy Chief of Staff Air & Space Operations, Headquarters USAF.

Boeing has named **Darryl W. Davis** the first vice president of Air Force Systems Global Strike Solutions. Davis successfully led the Joint Unmanned Combat Air Systems (J-UCAS) X-45 program, positioning Boeing in the unmanned systems arena.

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out the United States. It also gives warfighters the ability to provide feedback about the design, development and analysis of equipment they will eventually operate.

Roger Krone, vice president and general manager of Boeing Army Systems, says "the expansion of the MSAC to include an FCS portal as well as rotorcraft and other military capabilities will allow customers to see firsthand how ultimate users will interact with systems and products that are still being designed before the items complete development and can be procured and deployed into operational use."

The MSAC features a high bay area capable of housing vehicles and equipment connected to the MSAC networks. It also features dome simulators; gaming, control and briefing rooms; and various laboratories linked together through a common communications area. The facility includes a new closed viewing area seating 37 people that supports engineering and testing interactions with several Boeing centers and the FCS Defense Research Engineering Network (DREN), a national network providing viewing, integration and interaction capabilities.

Through the MSAC, for example, engineers and customers in St. Louis can observe and participate in a maneuver simulation in Huntington Beach, CA while flying an Unmanned Aerial Vehicle (UAV) in Mesa, AZ, and observing hardware and computer systems in Philadelphia. ■

Laser JDAM Hits Moving Target in Flight Test

Boeing tested its 500-pound Laser Joint Direct Attack Munition (JDAM) for the first time in May against a moving target at Eglin AFB, FL.

"The U.S. Air Force and Navy are very interested in a near-term flexible weapon that can simultaneously be used against stationary targets in adverse weather and moving targets in clear weather, and this test shows that Laser JDAM can meet those requirements," said JDAM Program Manager Rick Heerdt.

Bombs away

For the test, a Laser JDAM was released from a USAF F-16 flying at 20,000 feet approximately four miles from an unmanned truck moving at 15 miles per hour. A second F-16 trailing the test aircraft targeted the truck with a laser. The inert JDAM tracked the laser to the target and scored a direct hit on the truck.

The laser sensor is a modular kit that is easily installed in the field to the front of existing JDAM weapons. If a laser isn't needed for a given mission, a standard JDAM can be used. The laser-guided JDAM simply adds additional capability to the outstanding GPS/INS all-weather capability current JDAMs offer, turning the JDAM into one of the most versatile weapons available.

Flight tests for the Laser JDAM are planned through February 2006 to demonstrate the system is ready for production. ■

Initial GMLRS Unitary Rockets Delivered

Lockheed Martin has delivered the first 72 Guided Multiple Launch Rocket System (GMLRS) Unitary rockets to the U.S. Army. Guided

See **News Briefs,** Continued on page 13

CALENDAR OF EVENTS

Summer PEO Forum
Date: July 27-28, 2005
Theme: *"Precision Engagement–Creating Effects Based Operations for the Future Battlefields"*
Location: Emerald Coast Conference Center, Ft. Walton Beach, FL

Precision Strike Technology Symposium
Date: October 18-20, 2005
Theme: *"Accelerating Precision Strike Technology for Stability Operations and Protection of Coalition Forces"*
Location: The Johns Hopkins University/Applied Physics Laboratory, Kossiakoff Center, Laurel, MD
Call for Papers available on PSA website

Winter Roundtable
Date: January 25, 2006
Theme: *TBD*
Location: Crystal City Marriott Forum, Arlington, VA

Annual Programs Review
Date: April 2006
Theme & Location: *TBD*

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

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website: www.precisionstrike.org

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MLRS Unitary integrates a 196-pound unitary warhead into the rocket, giving battlefield commanders the ability to attack targets up to 70 kilometers away with high precision.

GMLRS is a Future Force system with a modular design intended to incorporate future growth. The system incorporates a GPS-aided inertial guidance package integrated on a product-improved rocket body. Small canards on the guided rocket nose provide basic maneuverability and enhance the accuracy of the system. ■

Final Joint STARS Aircraft

The Electronic Systems Center at Hanscom AFB, MA, delivered the 17th and final E-8C Joint Surveillance Target Attack Radar System aircraft to the 116th Air Control Wing at Robins AFB, GA in March. The Joint STARS aircraft is the world's most advanced wide-area airborne ground surveillance, targeting and battle management system. The E-8C is a modified Boeing 707-300 series commercial aircraft with radar, communications, operations and control subsystems.

Keeping the Missiles Working

Separated from the rest of Minot AFB, ND, by miles of fence topped with razor wire and high-tech surveillance equipment, certain airmen see few people during the duty day other than their military counterparts. For that, their daily efforts go largely unnoticed.

They are assigned to the 5th Munitions Squadron, and once inside their weapons storage area, the reason becomes clear for the isolation and protection – they keep the missiles working.

Examining an air-to-ground missile in the weapons storage area. The B-52 Stratofortress can hold up to 20 of these missiles.

Missile and space systems electronics maintainers work on jet engines, flight controls and explosive components, programming computers and doing body work and paint touch-ups.

"When you put all the pieces together, and your end result is a missile or piece of equipment that's up and running that wasn't before, it's very rewarding," said one maintainer. ■

Bagram Airmen Build Bombs

Building up flares and guided bombs is all in a day's work for ammunitions troops at Bagram AB, Afghanistan, as it is for conventional munitions technicians throughout the region.

Being assigned to the 455th Expeditionary Aircraft Maintenance Squadron ammunitions unit is about keeping the munitions supply lines flowing, officials said. "Ammo" airmen work around the clock daily to keep the A-10 Thunderbolt IIs stocked with powerful payloads.

Working such real-world missions with about half of the manning ammo units typically function with at home station means that they must work twice as hard.

Accuracy is the highest calling for ammo units. Maintaining 100 percent accountability of every munition is not optional – it is mandatory. Following instructions down to the most minute detail is one step in minimizing collateral damage when pilots must pull the trigger.

One airman said his job isn't glamorous, but it's important. "Without ammo, (Bagram) would just be an airport." ■

Inspecting rocket fins to ensure they will open correctly when needed.

Mid Range Munition

Alliant Techsystems has received a $23 million contract for work on dual mode seeker technologies including a semi-active laser for the Mid Range Munition (MRM) program, a precision-guided 120mm weapon designed to defeat enemy targets at line-of-sight and beyond-line-of-sight ranges. This new contract will fund further development efforts culminating in a technology demonstration flight test in April 2006. ■

Lockheed Martin Opens Center for Innovation

Lockheed Martin recently opened its Center for Innovation – a unique,

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collaborative laboratory that offers the tools, environment and expertise to help create new operational concepts and powerful net-centric solutions.

The 50,000-square-foot facility, located in Suffolk, VA, provides proximity and connectivity with a number of military commands, national security and other government customers.

The Center offers capabilities unique to this industry. The initial work focuses on rapid prototyping, collaborative experimentation and exhaustive analysis to address customers' most pressing needs and future requirements. These efforts include: advanced command, control and communications and information operations; joint force projection; logistics; surveillance and reconnaissance; missile defense; and homeland security.

"Our intent with the Center is to provide a collaborative environment for commanders, policy makers, operators, analysts and engineers to assess and experiment with new operational concepts and capabilities," says Stan Sloane, executive vice president of Lockheed Martin's Integrated Systems & Solutions business area.

"Its extensive technical resources, including the first of its kind Global Information Grid testbed, ensure that the collaborative solutions developed here will push the boundaries of the information era and have a profound effect on our nation's ability to plan and execute vital national operations." ■

Predator Converted for Urban Assault

Lockheed Martin has expanded the capabilities of its Predator anti-tank weapon, modifying the shoulder-fired, short-range anti-tank weapon into a direct-attack urban assault weapon. Renamed the Short-Range Assault Weapon-Multiple Purpose Variant (SRAW-MPV), the new urban assault missile has a multiple-purpose blast warhead, enabling it to defeat a variety of targets such as buildings and bunkers, as well as light-armored vehicles. ■

$18.5M Initial Production Contract for SDB

Boeing has received an $18.5 million USAF contract to begin low-rate initial production of the Small Diameter Bomb (SDB). Under this contract, Boeing will produce 201 SDBs and 35 carriages. At 71 inches long, this 250-pound weapon quadruples the weapons load on tactical aircraft. The SDB will first be deployed on the F-15E Strike Eagle in 2006. ■

SFW for Maritime Missions

Textron Systems says its Sensor Fuzed Weapon (SFW) was successfully dropped from an F-16 over littoral targets during recent testing at Eglin AFB, FL. One SFW hit both of the test targets - stationary 36 ft. Mini Armored Troop Carriers (MATCs). The SFW was successful in achieving multiple, hull piercing hits on both targets. Textron Systems newly developed target recognition algorithms permit individual Skeets to recognize and adjust to a littoral environment while maintaining current land combat capability. Subsequent testing is planned for moving maritime targets using a B-1B bomber's ground moving target tracking radar. ■

Max Range SLAM-ER Test

A Boeing Stand-Off Land Attack Missile-Expanded Response (SLAM-ER) weapon was recently launched from its maximum range, scoring a direct hit. In another long-range test, a SLAM-ER was launched for the first time from an S-3B Viking, again scoring a direct hit. Both tests were at the Navy's Sea Test Range on San Nicolas Island, CA. The maximum-range test was from an altitude of 40,000 feet from an F/A-18B more than 170 miles from a mobile ship target. For the S-3B launch, the SLAM-ER was released from 15,000 feet, approximately 115 miles from the target. ■

Smart Mortar

BAE Systems has been selected by the Defense Advanced Research Projects Agency (DARPA) to convert a 60 millimeter mortar into a precision guided munitions system.

The Optically Directed Attack Munition (ODAM) program is a technology development and integration initiative to demonstrate a laser-guided, low cost optical seeker for the 60mm mortar. ■

In the next Issue

Wrapup on PSA's Summer PEO Forum

Precision Strike PEO Forum

Emerald Coast Conference Center
Emerald Ballroom II
1250 Miracle Strip Parkway, Ft.Walton Beach, FL

July 27-28, 2005

Theme:
Precision Engagement-Creating Effects Based Operations for Future Battlefields

Confirmed speakers include:

MG Robert Chedister, USAF—PEO Weapons and Commander Air Armament Center, Air Force Materiel Center, Eglin AFB, FL
RADM Timothy Heely, USN—PEO for Strike Weapons & Unmanned Aviation
COL Earnest Harris, USA—ATACMS PM (invited)
BG Martin Post, USMC—Assistant Deputy Commandant for Aviation
BG Phillip Coker, USA—Director, Capabilities Developments, Futures Center U.S. Army Training and Doctrine Command
Randy Bigum—Vice President, Strike Weapons, Lockheed Martin Missiles & Fire Control
Thomas Robillard—Director, Air-to-Air Missile Systems Wing, Eglin AFB, FL
Lynda Ruthledge—Program Manager NCW-Network Weapons ACTD

For more information or to register for this event, please go to our website: www.precisionstrike.org. Exhibition and sponsorship opportunities available.

PSTS-05 18-20 OCTOBER 2005
Kossiakoff Conference Center, JHU/APL, Laurel, MD

Accelerating Precision Strike Technology for Stability Operations & Protection of Coalition Forces

Invited Keynote & Select Speakers include:
Honorable Francis J. Harvey—Secretary of the Army
General James L. Jones, USMC—Commander, USEUCOM & SACE
Honorable Dale E. Klein—Assistant to SECDEF for Nuclear, Chemical & Bio Defense
Honorable James A. Tegnelia—Director, Defense Threat Reduction Agency
Honorable James S. Gilmore III—Former Governor of Virginia
RADM Tim Heely, USN—PEO for Strike Weapons & Unmanned Aviation, NAVAIR
Sue Payton—DUSD, Advanced Systems & Concepts, OUSD(AT&L)
Dr. Charles Holland—DUSD, Science & Technology, DDR&E
United States Joint Forces Command Military Leader
United States Strategic Command Military Leader

Unclassified sessions will address:
- Strike Weapons and Unmanned Aviation
- Accelerating Technologies for Precision Engagement
- Stability Operations & Protection of Coalition Forces
- Technological Strategies among the Army & its Sister Services
- Technical Sessions on Targeting, C4ISR, Weapons & Effects
- Implementation of Congressional Advisory Panel Decisions Involving WMD
- Precision Engagement—Future Operations
- International Technology Programs
- Vision for NATO's Transformation

Classified sessions will address:
- Threat Assessment Update
- Countering the Proliferation of WMD
- Nuclear, Chemical & Biological Defense Programs
- Creating Effects Based Operations for Future Battlefields
- Technical Session
- Improving Target Location Error
- Precision Global Strike

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