



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

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"From Cruise Missiles Association to Precision Strike Association we have been dedicated to advancing the art and science of precision engagement concepts and technology for more than 25 years."

VISION STATEMENT

We aspire to be the premier association dedicated to advancing the art and science of precision engagement concepts and technology.

To accomplish this, we will promote the development of systems and procedures in order to locate, fix, track, target, and attack fixed, moving, and relocatable targets.

We recognize that battlespace management, the network within which it functions, and the adjunct command and control requirements are crucial to success on the battlefield.

PSA has a global perspective and welcomes international participation.

Precision Effects & Technologies — Current & Future Contested Environments

By Ginny Sniegou, PSA Programs Chair

The precision strike community values your participation and looks forward to having you and your cleared colleagues join us to share in this crucial, stimulating and timely 27th annual SECRET//NOFORN Precision Strike Technology Symposium (PSTS-17) on 24-26 October 2017 at the JHU/APL Kossiakoff Center, at Laurel, MD. Please register soon.

"Mr. President, your military does not scare" declared Secretary of Defense James Mattis at the 9/11 Ceremony. Well, let me emphasize that the precision strike community is prepared to help meet that mandate. This year's theme *Precision Effects and Technologies in the Current & Future Contested Environments* allows us the opportunity to pursue many of the Administration's challenges and priorities by showcasing the following critical topics:

- **Intelligence Assessments...**Mid East, Russia, Iran, North Korea, China + South China Sea
- **Hypersonic Weapons...**The Threat, Offensive & Defensive Capabilities & Much More
- **Defense Rebuild Priorities...**More Capable, Lethal and Resilient Joint Force
- **F-35...**High End vs Permissive Fights
- **Geo-Strategic Security Environment...**Shaping
- **Precision Engagement...**Current & Future Fights

Don't miss out on this extraordinary 3-day symposium that will feature powerful military and civilian leaders including



General
Stephen "Seve" Wilson, USAF



Vice Admiral
Mathias "Mat" Winter, USN



Major General
William "Bill" Hix, USA



Rear Admiral
Mark Darrah, USN

See **PSTS-2017**, cont. on pg. 14

IN THIS ISSUE

PSTS-17 Preview 1

PSAR-17 Wrapup. 3

Perry Award Wrapup. 9

Johnson Award 11

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Chairman's Column

in threats coming from near-peers. If that were the extent of our issues we would call ourselves lucky.

Yet today the world is in full tumult. North Korea threatens nuclear annihilation. China continues to exert dominance over the South China Sea. Iran continues to exert its grip across the Middle East, and Russia has successfully expanded its influence across Eastern Europe, the Mediterranean and into the Middle East.

Our Pacific Commands are the tip of the spear facing the greatest threats to our nation. It is vital to connect the Precision Strike Community to the Warfighter starting down the threat as well as the resource sponsor assigning resources to Warfighter needs. It is our charge to find and develop the technology and systems that provide our Warfighters the means to prosecute this new contested fight.

The Precision Strike Association (PSA) is providing a powerful forum for the rich exchange of ideas, talent and energy between government, industry, laboratories and academia in the face of the growing threats.

This year our classified Precision Strike Technology Symposium (PSTS-17) theme is Precision Effects and Technologies in the Current & Future Contested Environments."

This event builds upon the Changing Strategic Environment theme and the Defense Leadership Panel's focus on precision engagement in the future fight from our Precision Strike Annual Review (PSAR-17).

Just a short year ago we were in the midst of a presidential election and an unprecedented increase

PSTS-17 promises to be a superb event offering a challenging exchange of ideas and a front row look at the threats. Please plan to join us at this unique event! For more information and to register, please visit our website: www.precisionstrike.org.

The Precision Strike Community is aging, and like many aerospace and defense sectors, we are facing a technical expertise gap in the coming years as engineers and professionals leave the workforce.

PSA events, like PSTS, offer a unique opportunity to develop up-and-coming mid-career industry and government professionals in the areas of business development, customer engagement, strategy, program management, and future executive leadership.

The PSTS provides an intimate and secure setting to listen to and network with senior leaders in the government community, government laboratories and industry as they discuss, in a classified, US-only setting, the strategic challenges and direction of our dynamic national security environment.

The insights gained, relationships developed and contacts developed, will over the years provide a substantial return on investment to mid-career employees moving up their organizations. I encourage PSA members to be deliberate in advocating for and assisting in providing this development opportunity to the next generation of Precision Strike Community leadership.

What else is going on at PSA? Our exclusive PSA Captains of Industry Roundtable Luncheon series continues. USN RADM David Hahn, Chief of Naval Research/

See **Chairman's Column**, cont. on pg. 13

PSAR 2017: The Versatility and Capability of Precision Munitions in a Changing Strategic Environment

The Precision Strike Association (PSA) held its Precision Strike Annual Review (PSAR-2017) March 28-29 at the Waterford at Springfield, Springfield, VA.

The high caliber of numerous relevant topics and superb speakers presented by the Precision Strike Annual Review Team chaired by Ginny Sniegion, CAPT David “Jumbo” Baird, USN, Dave Rice, Dick Rumpf and Ken Masson resulted in a highly challenging and extremely productive two-day Review that focused on *The Versatility and Capability of Precision Munitions in a Changing Strategic Environment*. Highlights of PSAR-17 remain worthy of your attention and consideration and are addressed below.

PSAR-17 highlighted critical topics and challenges to address precision strike’s way forward. Discussions with distinguished leaders, policy makers and acquisition experts highlighted the critical two-day event.

The speakers said maintaining dominance through technological innovation in a changing strategic environment is key, as precision strike community must continue to address known capability deficiencies to support advanced technology investments for precision strike engagements. They characterized the changing strategic environment, defined the national security and national military strategy, and addressed the requirements, capabilities and challenges to support the Third Offset Strategy innovations and initiatives undergoing development for use during anticipated future conflicts.

Precision concepts and technology ensure that the U.S. military keeps its strategic advantage, but emerging threats continue to jeopardize this advantage. The United States faces ever-increasing challenges to maintain its global leadership role, as tensions between the United States and North Korea have been rising in recent months over Pyongyang’s development of a nuclear program.

It remains imperative that the Trump Administration has the systems and munitions it needs to effectively deter and decisively win future conflicts. This will continue to require precision strike engagement across all spectrums of conflict. The Defense Industry Team must continue to focus on developing new technologies for emerging capabilities, promoting innovative concepts and investing in critical technological modernization while refining our federal acquisition processes.

A special feature of PSAR-17 was presentation of the 21st William J. Perry Award that recognizes significant contributions to the development and support of precision strike systems that have led to the strengthening of our vital national security interests.

This year’s award was presented to Chuck “Tooba” Kelly, a Senior Munitions Staff Specialist for the Under Secretary of Defense (Acquisition, Technology and Logistics), Tactical Warfare Systems, Office of Land Warfare and Munitions, on behalf of Dr. Bill Perry who provided special remarks at the award ceremony luncheon via video. (See article starting on page 9.)

This year’s Precision Strike Annual Review got underway with remarks from **Representative Rob Wittman (VA-1st District)**, Chairman of the Seapower and Projection Forces Subcommittee.



Rep. Rob Wittman
(VA-1st District)

He said the National Defense Strategy is “the baseline we need to focus on. For years we allowed the budget to drive the strategy. This year we are focused to have the strategy drive the budget. That has to be the scenario especially in today’s world when one views what’s happening in Russia, the Middle East, the South China Sea and North Korea.”

Wittman said North Korea “is on track to develop intercontinental ballistic missiles able to deliver nuclear warheads, and North Korean leader Kim Jong Un is unpredictable. That’s the scary part.”

He added: “These things are all problematic to the United States. We have to make some pretty difficult decisions in the next year or so on what our response will be. Our military options must be on the table. We need to know what we need to counter the growing capabilities of North Korea.”

The B-21 Raider is a heavy bomber under development by Northrop Grumman. As part of the Long Range Strike Bomber program (LRS-B), it is to be a very long-range, stealth strategic bomber for the US Air Force capable of deliver-

ing conventional or thermonuclear weapons. Expected to enter combat service by 2025, it will complement existing B-1 Lancer and B-52 Stratofortress bomber fleets in service and eventually replace these bombers. “The B-21 is essential for the strategic triad, as stealth is critical. We need this program to stay on track, on budget and on schedule,” he said.

Chief of Naval Operations Admiral John Richardson said the current trajectory of his shipbuilding program gets the Navy to 355 ships sometime in the late 2030s. Wittman said “that is where we need to be. I want to make sure that happens.”

Wittman also said the US Navy requires a dozen aircraft carriers. He said the five years it takes to build them needs to be shortened and they should be constructed two at a time to reduce costs.

As regards precision strike weapons, Wittman believes the Navy needs to replace the Harpoon with a system with more range and lethality and requires a surface-strike Tomahawk.

Acquisition reform is also on Wittman’s agenda. “We need to simplify the process to get technology to the Warfighter more quickly and do it in a more cost-efficient way,” he believes.

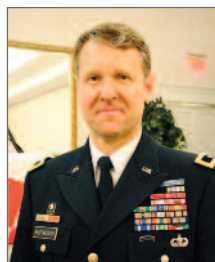
PSA Chairman Ken Masson said the PSAR reflected a changing macro-environment, as noted by Rep. Wittman. Masson said “it is important that we put the right focus on the military to meet the real threats, the needs of service



Ken Masson



Dave Rice



Major General
Chris McPadden, USA



Lieutenant General
Jack Weinstein, USAF

members. We must send the right message to our adversaries. We have to find ways to innovate and get capabilities out to our Warfighters.”

PSAR Annual Review Chair Dave Rice said the speakers were selected “to show how our lethal, versatile and flexible precision weapons are used in different ways, for different missions and in different environments.”

Next up at the podium was Major General Chris McPadden, USA, Deputy Director for Joint Strategic Planning, J-5, Joint Staff, who said there was a lot going on regarding National Military Strategy joint and strategic planning. He said “the NMS has all the key elements of the overall strategy, the ends, the ways and the means. The challenge is to make it a reality.” McPadden said the NMS is comprised of three elements: create a plan; set the vision; make it a reality; and, then assess how we are doing.

In the first day’s keynote address, Lieutenant General Jack Weinstein, USAF, Deputy Chief of Staff for Strategic Deterrence and Nuclear Integration (A10), HQ USAF, discussed how the strategic triad (ICBMs, SLBMs and bombers) are keeping the major powers in check.

He said a new and “critical” Nuclear Posture Review is underway as the world is vastly different than in 2010 when the last NPR was completed. “As we gear up for the NPR, we must look at the value the strategic triad brings to the fight,” he

stated. Weinstein said the United States must protect itself against: an adversary’s breakout in nuclear weapons; a breakdown in any leg of our strategic triad; and, a breakthrough that can counter any segment of our strategic triad.

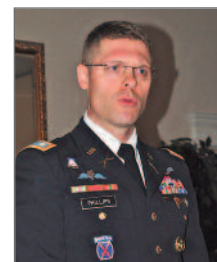
“No one need doubt the capabilities of the US strategic triad, but the systems are old and need to be modernized so they work in the future. Weinstein said the B-21 Raider, a stealthy long-range, heavy strategic bomber under development by Northrop Grumman and capable of delivering conventional or thermonuclear weapons is critical to the nation’s defenses.

“As we modernize, we need to make sure that flexibility is built into our new systems. I am confident where we are right now but we must keep the foot on the accelerator. We must hold the line,” he added.

“Our nuclear forces provide a foundational capability. Deterrence is an investment worth every nickel,” he stated.

Lieutenant Colonel Dwight “Buzz” Phillips, USA, the Army’s strategy advisor in OSD(Policy), Strategy and Force Development, discussed how the Third Offset Strategy applies to precision strike.

The Third Offset Strategy is designed to allow the US to maintain technological superiority as it transitions from one warfighting regime to another and bolster a weakened conventional deterrence. In addition to new technologies, the strategy requires innovative thinking, the development of new operational concepts, new ways of organizing, and long-term strategies.



Lieutenant Colonel
Dwight Phillips, USA

While the first and second offset strategies supported DoD well for 25 years, the margin of technological superiority, particularly for guided munitions, is eroding. Unlike the first two offset strategies, the third relies on commercially driven technology such as robotics, autonomously operating vehicles, advanced guidance and control systems, visualization, biotechnology, miniaturization, advanced computing, big data analytics and additive manufacturing.

LTC Phillips listed the five main building blocks of future technology trends that are important elements of the Third Offset Strategy. They are: autonomous learning systems; human/machine collaboration; assisted human operations; advanced manned/unmanned combat teaming; and, hardened networked autonomous weapons.

“The Third Offset is both technology and new concepts,” he stated. “The precision strike community must provide the Warfighter with the tools to astonish the world, deliver precision, win and deter aggression in the future.”

Michael Herson, President and Chief Executive Officer of American Defense International, offered an industry perspective on the evolving strategic environment, specifically addressing how much more funding the Pentagon can expect from the Trump Administration for precision strike systems purchases.

He sees “more uncertainty as the battle for resources will continue between procurement, research and development and operations and maintenance (O&M) spending. Acquisition reform will also continue. As such, there will be the need for continued engagement on Capitol Hill.” Herson believes “out of chaos comes opportunities. In time, because of the new mindset our leaders have, we will adapt with some certainty.”

The Defense Leadership Panel’s topic was precision engagement in the future fight. The session was moderated by **Major General H. Stacy Clardy III, USMC**, Deputy Director for Force Management, Application and Support, J-8 Joint Staff. The multi-service panel included: **Major General Peter Gersten, USAF**, Director of Strategic Plans, Office of DCS for Strategic Plans and Requirements, HQ USAF/A8X, **Colonel (P) Steve Maranian, USA**, Commandant, US Army Field Artillery School & Chief of Field Artillery, **Rear Admiral Roy “Trigger” Kelley, USN**, Director, Joint Strike Fighter Fleet Integration Office, and **Colonel John “Buss” Barranco, USMC**, APW Assault Support and Weapons and Integration, HQMC Aviation.

Major General Clardy said he hoped the event “advanced our understanding of gaps and opportunities that exist for precision strike. We must get beyond development of

incremental approaches that take too long to mature and are too costly for DoD to procure in large numbers.”

Major General Gersten addressed air power, specifically weapon selection for the desired effect, and how this is accomplished across the spectrum of conflict. “I say we’ve done a remarkable job through industrial partnerships and acquisition to put precision weapons on the mark. The world looks on us in awe.” He added: “I look for our industrial partners to assure weapons accuracy, maintain precision, increase range and stand-off capability, ensure survivability and keep the price point down.”

Rear Admiral Kelley discussed the naval vision for what the F-35 will provide to the Joint Force. “He said “when it comes to the profession of war, our tools mean everything to our success. We must bring the right weapons to the fight.” He outlined the current and future weapons load for the various F-35 variants.

Colonel Maranian discussed precision fires in multi-domain battle and how training at Fort Sill is overcoming some gaps identified over the past several years. He catalogued the current cannon artillery and future systems under development.

“Fires must be precise, responsive, effective and multi-functional. These tenets are time-tested and enduring,” he said. “The Army is continuing to modernize its munitions and platforms. In the short term, we look for a systems life extension program (SLEP) for the Army Tactical Missile System (ATACMS) as a bridge to development and fielding of Long Range Precision Fires (LRPF),” Maranian said.

LRPF, with a range greater than 400 kilometers, will eventually replace ATACMS. The Army also wants a launch pod missile container that holds a minimum of one missile



Michael Herson



The Defense Leadership Panel:

(l-r) Col Barranco, Col (P) Maranian, RADM Kelley, MG Gersten, MG Clardy

and is compatible with existing launcher platforms, such as the Multiple Launch Rocket System (MLRS) and the M142 High Mobility Artillery Rocket System.

Maranian said “precision munitions will always be in high demand by our commanders. We must find a balance in precision, near precision and area effects. In the future, we must significantly increase US fires capability, lethality, and range to provide overmatch against our adversaries.”

Colonel Barranco discussed the USMC’s new concept, Distributed STOVL Operations, which seeks to provide the Joint Force Commander with options in the Anti-Access / Area Denial (A2/AD) environment. It calls for distributed short takeoff-vertical-landing (STOVL) using U.S. Marine Corps F-35B Lightning II fighters. F-35Bs will operate from shifting networks of mobile forward arming and refueling points (MFARPs). All these sites are considered “mobile” and are intended to maintain elements of “deception and decoy” – in keeping with the idea that the aircraft are supposed to be distributed and difficult to find and target.

Rear Admiral Mark Darrah, USN, Program Executive Officer for Unmanned Aviation and Strike Weapons, discussed how to advance weapons capabilities in multi-domain environments as enabled by his Mission Area Lead Integrator for Surface and Strike Warfare (MALISS) program.



Rear Admiral Mark Darrah, USN



Colonel Eric Forsyth, USAF

He said MALISS ensures system of systems (SoS) mission wholeness for the Surface and Strike Warfare (SUW/STK) mission areas. Challenges include disaggregated databases with no common interpreter and a culture of platform focused resourcing and development. But he said the challenges can be overcome by maximizing the number of systems that can access and execute multiple functions using common data and direct application of autonomy across systems.

With weapons collaboration, said Darrah, networked sensors work together to build a complete picture, providing increased mission effectiveness and lethality for platforms and weapons. “We must focus on data needed to fill multiple roles, not the platforms,” he believes.

The second day of PSAR-17 began with Colonel Eric Forsyth, USAF, PEO for Fixed Wing Programs, HQ US Special Operations Command (USSOCOM), showing what fielded special operations fixed-wing tactical aircraft are bringing to fight.

He also discussed future capabilities under development. They include a Small Glide Munition (SGM), a 60-lb tactical weapon able to be fitted on a variety of platforms, including AC-130 gunships or unmanned aircraft systems. The munition armed with a 35-lb warhead should be operational this year, said Forsyth.

USSOCOM also plans to arm A-130 gunships with the Small Diameter Bomb II, Smart 105mm artillery and a guided 30mm round. USSOCOM also expects to demonstrate a high energy laser weapon on the AC-130J in the next 2-3 years, he added.

Captain Mike Smith, USAF, Chief of Weapons & Tactics, 720th Special Tactics Group, Air Force Special Operations Command

(AFSOC), discussed a new concept for special tactics in anti-access/area denial (A2AD) environments.



Capt Mike Smith, USAF

The concept, he explained, involves use of a low-altitude small unmanned aerial system (SUAS) swarm combined with a high-altitude balloon network.

A digital tether of up to eight orbiting small drones would provide targeting support, communications, noise decoy capabilities and weather information. The drones would also have lethal payloads for kamikaze missions.

The balloon network, on the other hand, would be a distributed sparse array that is either ground-launched or airdropped to provide command and control and precision navigation and timing (PNT). It would also provide jamming mitigation, targeting services and resupply of isolated special tactics teams (STTs). Smith said the balloon network could be survivable or expendable and low cost. “A whole day’s operation would cost less than \$100,000. It could replicate what a satellite network does. That’s a really good savings,” said Smith.

Dr. Jerry McGinn, Acting Deputy Assistant Secretary of Defense, Manufacturing and Industrial Base Policy, OUSD(AT&L), provided some insight into trends for the



Dr. Jerry McGinn



Vice Admiral James Foggo II, USN

defense industrial base under the Trump administration.

He said challenges include “fragile” industrial base sectors and lagging research and development spending. But he said the companies making up the US defense industrial base “are by and large incredibly healthy and financially performing very well and there is robust competition in all major programs.”

Vice Admiral James Foggo III, USN, Director, Navy Staff, keynoted the second day’s program, reaching back to his time with the Sixth Fleet to discuss precision strike from the sea.

Foggo showed how naval strike forces led by aircraft carriers, surface combatants and submarines provide long-range sea-based strike capabilities. “The pillar of naval power projection includes conventional strike against targets ashore, integrated kinetic strikes and non-kinetic fires against enemy forces,” he said.

The US Navy was tasked in 2011 to enforce UN Security Council Resolution 1973, which called for a no fly zone over Muammar Gaddafi’s Libya. Operation Odyssey Dawn involved multi-domain precision strikes against integrated air defense systems, using Tomahawk missiles.

Five years later, Operation Odyssey Lightning involved strikes against ISIS in Libya. Foggo said the USN provided distributed lethality using AV-8B Harrier II jump jets from the USS Wasp amphibious assault ship.

Foggo said “distributed maritime operations, stealthy operations and simply getting more bang for the buck” led to success in both naval strike operations.”

The Precision Engagement in the Current Fight Panel was moderated by **Captain David “Jumbo” Baird, USN**, and included: **Commander**

James “Sleestak” Reeve, USN, N98 Air Warfare Weapons Section Head, OPNAV, **Lieutenant Colonel Ryan “Thriller” Schiller, USMC**, Air to Ground Weapons (APW-72), HQMC Aviation, **Lieutenant Colonel (Sel) Brian “Sloth” Baker, USAF**, Air and Space Interoperability Council (ASIC), Regional Plans & Posture Division, A8XX, HQ USAF, and **Lieutenant Colonel Kenneth Britt, USA (Ret)** Office of DCS G-8, US Army HQDA.

“Sloth” Baker led off the panel, discussing precision engagement as applied in the ongoing Operation Inherent Resolve (OIR), the USAF operation against ISIS. He also spoke on USAF precision engagement trends and precision strike weapons expenditures, noting that since OIR was initiated, over 51,000 munitions have been expended, with JDAM comprising the majority of OIR expenditures.

“Sleestak” Reeve offered a progress report on the Lockheed Martin Joint Air-to-Ground Missile (JAGM), which replaced the AGM-169 Joint Common Missile that was cancelled due to budget cuts. JAGM will replace the current air-launched BGM-71 TOW, AGM-114 Hellfire and AGM-65 Maverick missiles.

The US Army, Navy and Marine Corps plan to buy thousands of JAGMs. Recent milestones include JAGM being fired from the MQ-1C Gray Eagle and from the AH-64D gunship. JAGM is intended to reach

initial operational fielding in 2018.

“Thriller” Schiller offered insight into the Advanced Precision Kill Weapon System (APKWS), which turns a standard unguided 2.75-inch (70 millimeter) rocket into a precision laser-guided rocket, giving Warfighters a low-cost surgical strike capability.

It uses semi-active laser guidance technology to strike both soft and lightly armored targets in confined areas, providing greater accuracy and mission effectiveness. Already arming the AH-1W, AH-1Z and UH-1Y, the USMC is moving ahead with plans to integrate the BAE Systems APKWS II on the F/A-18A/D Hornet strike fighter. Schiller described the APKWS as “the coolest weapon in MC inventory.”

Finally, Ken Britt updated PSAR-17 attendees on the wide-ranging portfolio of the Program Executive Office Missiles and Space, which includes the new Lethal Miniature Aerial Missile System (LMAMS), the proven Guided Multiple Launch Rocket System (GMLRS), ATACMS SLEP and LRP Increment 1.

AeroVironment is providing the Switchblade LMAMS, designed to provide the Warfighter with a back-packable, non-line-of-sight precision strike solution with minimal collateral effects. The kamikaze drone is designed to crash into targets with an explosive warhead to increase precision firepower for platoon-sized infantry units.



The Precision Engagement in the Current Fight Panel: (l-r) Ken Britt, LTC (Sel) Baker, LTC Schiller, CDR Reeve, CAPT Baird

The loitering munition can also rapidly provide a powerful, but expendable miniature flying intelligence, surveillance and reconnaissance (ISR) package on a beyond line-of-sight (BLOS) target within minutes. The Switchblade is folded up inside a tube with wings unfolding once it gets airborne. It can be controlled up to 10 km, but its small size limits its endurance to 10 minutes.

Meanwhile, the LRPF Missile will attack, neutralize, suppress and destroy targets using missile-delivered indirect precision fires. LRPF will provide field artillery units with long-range and deep-strike capability while supporting ground combat units in full, limited or expeditionary operations.

The LRPF will replace the aging ATACMS, which is impacted by cluster munition policy. The 24/7, all weather, 200-plus pound weapon will be able to attack beyond 300 km, including area targets and point targets, such as air defense batteries, missile launchers and staging areas.

The warhead will include optimized compliant cluster munitions with multiple fuzing options. The Army is rapidly running out of ATACM unitary rounds. Increment 1 LRPF would sustain and advance the Army's capabilities to 2050 and beyond at an affordable cost.

In a luncheon address, **Dr. Peter Huessy** called for a new Iranian and Middle East security strategy.

"2017 may be, ironically, a particularly propitious time for US security policy to move in a different direction

— while also preserving what is right about US policy and changing what is wrong," he stated.

"Iran's hostile behavior is of a long standing nature, having been initiated in 1979 and continued through this past decade. It is not new and is not a reaction to bad American actions. It is rooted in the very nature of the Iranian regime. Unless we face that reality, our efforts to eliminate Iran's pursuit of both nuclear weapons and a hegemonic role in the Middle East will be for naught," he added.

"Better policy options for dealing with Iran are available to the United States. I envision combining current policy initiatives already put forward by the new administration into a counter-Iran security policy," said Dr. Huessy.

He believes "a serious initiative to take down and freeze the financial assets of Iran, its ally North Korea and their terror group friends could go a long way to slow Iran's march toward regional hegemony."

Dr. Huessy said: "A new national security strategy on Iran has to squarely face the true nature of the regime. Imbedded in its constitution is its call for revolutionary political Islam. And for the use of whatever violent tools it can obtain to achieve such ends including nuclear weapons.... If we do not, we will have only delayed not ended the emergence of Iran as a full-fledged, nuclear armed, revolutionary Islamic state, dedicated to our destruction and armed with the most awful weapons every invented."

Russian President Vladimir Putin was on the mind of **Dr. Stephen Blank**, a senior fellow at the American Foreign Policy Council, as Putin emphatically denies allegations of Russian meddling in the US presidential election.

"They have a longstanding tradition of innovative tactical adaptation, strategic originality and a completely different concept of war, which embraces not just military action, but total political action across the entire spectrum, and that includes media information warfare, he said.

"The Russian government must know that it can't go on in this fashion. Tensions that corrode the system from within will force change. I want to see this system taken down," he stated.

Dr. Blank believes "democracy is the greatest threat to the stability and security of today's Russian leadership. What they see is an attempt by the US to refuse to accept Russia's legitimate right to do as it pleases in world affairs, to be a great power which they believe is pre-ordained."

Presentations regarding US foreign military sales (FMS) policy was the final topic of discussion at PSAR-17. The U.S. Army was represented by **Ann Cataldo**, Deputy Assistant Secretary of the Army for Defense Exports and Cooperation, OASA (ALT). Her counterpart with the USAF, **Major General Lawrence Martin Jr.**, USAF, Assistant Deputy Under Secretary of the Air Force, International Affairs, OUSAF, provided additional perspective on the topic.

Cataldo offered an overview regarding military sales of Army precision strike munitions, security assistance and security cooperation. She noted that the Army is execut-



Dr. Peter Huessy



Dr. Stephen Blank



Maj Gen Lawrence Martin Jr., USAF and Ann Cataldo

ing about half of all FMS cases, government-wide, to include precision strike weapons in the areas of fire support (ATACMS, HIMARS and GMLRS), air-launched missiles (Hellfire), close combat tactical missiles (TOW and Javelin) and artillery.

She expects additional FMS cases at “flashpoints” in the South China

Sea and the Middle East and as the result of transnational terrorism. Cataldo offered to help industry navigate the technology transfer process.

Major General Martin described how “a versatile security cooperation framework with our partners is going forward, including precision strike

FMS transactions in the fight against ISIS. “Martin said the USAF is working to provide emergent close air support assets to allies and the F-35 to select foreign partners. Future FMS transactions will involve network enabled operations and interoperability. ■

“Tooba” Kelly Receives Perry Award

Charles “Tooba” Kelly, a Senior Munitions Staff Specialist for the Under Secretary of Defense (Acquisition, Technology and Logistics), Tactical Warfare Systems, Office of Land Warfare and Munitions, is the recipient of the 21st William J. Perry Award.

The award honors Mr. Kelly’s “superb contributions to precision strike systems.” He is a weapon systems acquisition manager with over thirty-two years of experience in the Department of Defense (DoD), including military service and civil service in acquisition management. He provides expert technical analysis and recommendations on major defense acquisition programs in the Land Warfare & Munitions Directorate. In this position, he is the lead for DoD Munitions Requirement process to produce the inventory requirements for all DoD munitions across the Military Services and the US Special Operations Command.

Mr. Kelly was presented the award during a luncheon award ceremony, a highlight of the Precision Strike Association’s Precision Strike

Annual Review (PSAR-17), which was held 28-29 March 2017 at the Waterford Conference Center, Springfield, VA.

The PSA’s Perry Award recognizes public or private sector leadership or achievement that results in significant contributions to the development, introduction or support of precision strike systems. It is named after the former U.S. defense secretary and precision strike weapons advocate.

This year marks the 21th consecutive year that the Perry Award was presented to a deserving individual or team of experts who have led to the strengthening of U.S. national security interests.

PSA Chairman Ken Masson said “there were a number of great nominees this year for the Perry Award, but in the end the choice of “Tooba” Kelly was clear.”

Masson added: “We are honored to recognize Mr. Kelly for his many contributions to our nation – both in service and for ensuring Warfighters have the right precision munitions available. The breadth and quality of his work have had a strong and enduring impact on the Precision Strike community providing a solid continuity of focus and unwavering support for our nation’s Warfighters. Mr. Kelly exemplifies the warrior ethos; it is a high honor to recognize



Charles Kelly & Ken Masson

someone who has so selflessly devoted his time and effort to providing for our soldiers, sailors airmen and marines in harms way.”

Unable to attend the ceremony, Dr. Perry provided thoughtful remarks via video. He said Kelly has had “an immediate and enduring impact on precision strike systems. His leadership has had a powerful effect on our country’s ability to get the right precision munition into the hands of the Warfighter in a timely manner.”

He continued: “The breadth and quality of “Tooba” Kelly’s contributions to the Precision Strike Community are a continuation of the highest standards set for this award and I am proud to have my name on his award.”

The Perry Award citation read by Dick Rumpf, a PSA board member, noted that Mr. Kelly chairs the DoD Fuze Integrated Product Team (IPT), leading representatives across the Department in analyzing issues and solutions to help attain the goals of the

**PSA thanks
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for sponsoring PSAR-17**



The Kelly Family

IPT while maintaining a healthy U.S. contractor and fuze technology base.

Mr. Kelly provides guidance on many current and future precision strike programs to include: the M142 High Mobility Artillery Rocket System, M31 Guided Multiple Launched Rocket System, M982 Excalibur, Hydra 70 Rocket, AGM-114 Hellfire air-to-surface missile, Joint Air-to-Ground Missile, and Long Range Precision Fires. He assists the Military Services for those programs, reviewing acquisition documentation to ensure that all the key items are in place prior to milestone reviews.

Mr. Kelly has had a particularly strong impact through developing, and maintaining, updating, and implementing a DoD Fuze Strategic Plan based on collaborative input from the Military Services, OSD, Department of Energy, and an Industrial Base Panel comprised of the major fuze vendors.

This strategic plan is key to identifying potential and current issues with fuze technologies and capabilities vital for DoD weapons systems, and providing recommendations for mitigations to solve those issues. Mr. Kelly leads and provides oversight of the Joint Fuze Technology Program.

The citation states: "Mr. Charles (Tooba) Kelly is the embodiment of the Precision Strike credentials for the William J. Perry Award."

Mr. Kelly said he was "very deeply honored and humbled to receive this award on behalf of all the people working in the trenches in the Pentagon" and he thanked Dr. Perry "for sowing the seeds for precision strike."

He offered some thoughts on precision strike. "What we need to do as a department, as an industry, is recognize what we want from our weapons systems, the desired effects. We hit a home run when we figure out the best way to deal with a target."

Kelly said interaction between government and industry is a "two way street" and government can help industry by providing procurement policy that makes sense. "We need production capacity that helps industry sustain business," added Kelly.

As regards combat in the future, Kelly said: We don't want to just win. We want to overwhelmingly win. We want to kick ass. The only way to do that is to make the stuff we have better."

Prior to service in the Office of the Secretary of Defense, LtCol Kelly was a U.S. Marine Corps aviator who held numerous leadership and operational billets. While he appreciates the large brass instrument, his call sign (Tooba) is actually short for "to be announced".

Mr. Kelly holds a bachelor's degree with Iona College in New Rochelle, NY, and is Defense Acquisition University certified Level III in Program Management. Mr. Kelly's achievements include a Navy and Marine Corps Achievement Medal, two Navy and Marine Corps Commendation Medals, a



"Tooba" Kelly

Meritorious Service Medal, a Defense Meritorious Service Medal, and an Office of the Secretary of Defense Award for Excellence. Named after the former U.S. defense chief and precision strike weapons advocate, the other winners of the prestigious Perry Award include: Dr. Perry, the first recipient (1997); former Vice President Dan Quayle (1998); RADM Walter M. Locke, USN (Ret.) (1999); The Johns Hopkins University, Applied Physics Laboratory (2000); NAVSTAR Global Positioning System Joint Program Office (2001); Rep. James V. Hansen (R-UT) (2002); Terry Little, a well-respected acquisition reform pioneer (2003); USAF/USN/Boeing JDAM Program Team (2004); U.S. Warriors of Operation Enduring Freedom and Operation Iraqi Freedom (2005); The Tactical Tomahawk Team (2006); The Small Diameter Bomb Team (2007); Guided Multiple Launch Rocket & High Mobility Artillery Rocket System Team (2008); U.S. Special Operations Command Stand-Off Precision Guided Munitions (SOPGM) Quick Reaction Team (2009); Sniper Advanced Targeting Pod (2010); Project Dragon Spear Joint Acquisition Task Force (2011); Massive Ordnance Penetrator (MOP) Team (2012), JAMS/Lockheed Martin Hellfire II Team (2013); BLU-129/B Team (2014); Dr. Paul Kaminski (2015); and James "Hondo" Geurts (2016). ■



Ken Masson, Ginny Sniegion, Charles Kelly, Dick Rumpf

Scott O'Neil Wins PSA Technical Achievement Award

Scott O'Neil, previously NAVAIR executive director for research and engineering, will receive the Precision Strike Association's 2017 Richard H. Johnson Technical Achievement Award on Wed., Oct. 25, during the organization's three-day Precision Strike Technology Symposium (PSTS-17) in Laurel, MD.

"We are honored to recognize Mr. O'Neil for his many contributions to our nation across his storied precision weapons career – ensuring warfighters always have the right precision munitions for the fight," said Ken Masson, chairman of the Precision Strike Association, an affiliate of the National Defense Industrial Association.

O'Neil had worked as a civilian with the Navy for 43 years before he retired in January 2016. For 10 years before his retirement, O'Neil was executive director and director for research and engineering of the Naval Air Warfare Center Weapons Division at China Lake, CA.

He currently is executive director of the Indian Wells Valley Economic Development Corp., and the China Lake Alliance. He is proprietor of S.M. O'Neil Consulting LLC, and a member of the Naval Research Advisory Committee, an independent, civilian, scientific advisory group that gives senior Navy leadership objective analyses in science, research, and development.

Masson credited O'Neil's work as having a strong and enduring impact on the precision strike community, "providing a solid continuity of focus and unwavering support for our nation's warfighters. Scott exemplifies the spirit and contributions of Dick Johnson."

The Richard H. Johnson Technical Achievement Award is named after the first recipient and is presented annually to recognize an individual from public or private sector for outstanding personal technical achievements resulting in significant contribution to precision strike systems.

The trophy is awarded based on nominations received and the deliberations of a distinguished jury of industry, government and military members of the PSA Johnson Award Selection Committee. Nominations for the Johnson Trophy are open to any US or allied individual.

During his career, Richard H. Johnson worked as an aircraft and missile designer for Temco Aircraft, Texas Instruments, Raytheon and other defense companies. Johnson received the first Johnson Trophy posthumously for leading the design or redesign of more precision strike airframes than any contemporary designer.

The other winners of the prestigious Richard H. Johnson Technical Achievement Award include: Robert J. Whalen (2010); Robert H. Widmer (2011); Keith Sanders (2012); Gary Polansky (2013); Chris E. Geswender (2014); Wade Dyer and Paul Manz (2015) and James 'Frank' Robbins (2016). ■

PSA Holds Roundtable Luncheon

On August 24, 2017, the Precision Strike Association (PSA) hosted a Captains of Industry Roundtable Lunch with USN RADM David Hahn, Chief of Naval Research/ Director of Innovation, Technology Requirements and Test & Evaluation (OPNAV N94), at the Orbital ATK Washington Operations Office.

This intimate event, classified at the Secret U.S. Only level, provided a valuable opportunity for the Navy and Industry to candidly discuss many of the pressing challenges

affecting our nation, and how we can partner more effectively to meet these myriad challenges rapidly and affordably.

PSA intends to hold additional Captains of Industry Roundtables in the near future. These events are limited to the first 25 people to sign up, with one representative per company – so be sure to RSVP early so you can participate in these highly valuable sessions!



RADM David Hahn, USN

Ken Masson, PSA's Chairman of the Board, said: "We look forward to your participation in PSA activities. To effectively seize the opportunity in the challenges and uncertainty

before us, it is incumbent on each of us to actively contribute to the process of change. I encourage you to bring your ideas on how PSA can help make the road to a stronger US smooth and straight." ■

Precision Weapons at the Tip of the Spear

The U.S. military on April 13 dropped the most powerful non-nuclear bomb in its arsenal against the Islamic State in Afghanistan, marking the first ever combat use of the massive ordnance.

An Air Force MC-130 special operations aircraft dropped the 21,000-pound GBU-43/B Massive Ordnance Air Blast, or MOAB, bomb against militants affiliated with the Islamic State of Iraq and Syria's branch called Khorasan, or ISIS-K, which operates in Afghanistan and Pakistan, according to U.S. Central Command.

The strike was designed to minimize the risk to Afghan and U.S. forces conducting clearing operations in the area while maximizing the destruction of ISIS-K fighters and facilities.

“As ISIS-K’s losses have mounted, they are using [improvised bombs], bunkers and tunnels to thicken their defense,” said Army Gen. John W. Nicholson, commander of U.S. Forces Afghanistan. “This is the right munition to reduce these obstacles and maintain the momentum of our offensive against ISIS-K.”

US President Trump previously ordered a missile strike on a Syrian airbase April 6 in reprisal for a deadly

chemical weapons attack by the regime of Syrian President Bashar al-Assad.

Two U.S. Navy warships launched over 50 Tomahawk cruise missiles at Al-Shayrat air base, home to both Syrian and Russian warplanes.

President Trump said the strike on the airbase was in the “vital national security interest of the U.S. to prevent and deter the spread and use of deadly chemical weapons.” It was the first direct American assault on the Syrian government and Trump’s most dramatic military order since becoming president.

The U.S. strikes — 59 missiles launched from the USS Ross and USS Porter — hit the government-controlled base in central Syria, where U.S. officials say the Syrian military planes that dropped the chemicals had taken off. The missiles targeted the base’s airstrips, hangars, control tower and ammunition areas, officials said.

Meanwhile, the U.S. Navy said its



The guided-missile destroyer USS Porter conducts strike operations while in the Mediterranean Sea.

electromagnetic railgun is out of the laboratory and ready for field demonstrations at the Naval Surface Warfare Center Dahlgren Division’s new railgun Rep-Rate Test Site at Terminal Range.

The revolutionary railgun relies on a massive electrical pulse, rather than gunpowder or other chemical propellants, to launch projectiles at distances over 100 nautical miles—and at speeds that exceed Mach 6, or six times the speed of sound. That velocity allows projectiles to rely on kinetic energy for maximum effect, and reduces the amount of high explosives needed on ships.

The railgun shoots the high-velocity projectile (HVP), a next-generation, low-drag, guided projectile that can be used in different gun systems. With its increased velocity, precision guidance and extended range, the railgun realizes the full range of the HVP’s scalable lethality. Together, both technologies will enable naval forces to address threats in the mission areas of surface fire support, anti-air and anti-surface warfare. ■



The MOAB is a precision-guided munition weighing 21,500 pounds, the largest non-nuclear conventional weapon in existence.

News Briefs

ER JSOW

Raytheon Missile Systems recently received a \$8.9 million contract for flight test demonstrations of an extended range version of the Joint Standoff Weapon AGM-154C-1 All-Up-Round.

The Joint Standoff Weapon, or JSOW, is a GPS-guided and IR terminal-guidance glide bomb that can carry a variety of warheads, including cluster munitions, high explosives and specially designed munitions for destroying hardened targets.

The AGM-154C-1 is a new variant being tested as a naval strike version of the weapon. It includes a two-way Common Weapon Datalink that allows the weapon system to target moving naval targets. It is network-enabled and has a range of more than 60 miles.

GPS artillery

Orbital Alliance Techsystems Operations was recently awarded a \$53.6 million modification to an existing contract for procurement of M1156 precision guidance kits.

The modification will provide PGKs for converting standard Army unguided 155mm artillery shells into GPS-guided munitions used by conventional artillery.

Work will be performed in Plymouth, Minn. and is projected to be completed by April 27, 2020. Fiscal 2017 funds of \$53.6 million were obligated upon award.

The M1156 PGK is a GPS guidance and fusing system that is designed to provide low-cost precision-guided artillery for conventional ground units. It is a bolt-on package that allows for easy installation in the field with little training required.

It has a circular error probable of 10 meters or less, providing much greater accuracy and effective range while reducing risks to friendly forces and civilians.

Show of Force

In September, in a blistering speech to the United Nations General Assembly, North Korea's foreign minister called U.S. President Donald Trump "mentally deranged" and said a strike on the American mainland was "inevitable."

The address was made as the Pentagon announced that it had

flown bombers and fighter escorts to the farthest point north of the Korean Demilitarized Zone by any such American aircraft this century.

"This mission is a demonstration of U.S. resolve and a clear message that the president has many military options to defeat any threat," Defense Department spokesman Dana White said in a statement.

"North Korea's weapons program is a grave threat to the Asia-Pacific region and the entire international community. We are prepared to use the full range of military capabilities to defend the U.S. homeland and our allies," White added. ■

CALENDAR OF EVENTS

Precision Strike Annual Review (PSAR-18)

Date: March 20, 2018

Location: Lockheed Martin Corporation, Crystal City, VA

This annual review will be conducted at the SECRET//NOFORN level

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

Chairman's Column, cont. from pg. 2

Director of Innovation, Technology, spoke Aug. 24 to our membership about the need to collaborate earlier in the S&T development process to inform and better enable technology transfer to the Warfighter.

OPNAV requirements officers from N95, N96, N97, N98, and N9I will be addressing the roundtable series in the coming months. PSA in conjunction with NDIA is looking to extend these events to the other Military Services. Look for additional announcements.

Please consider supporting or becoming more involved in Precision Strike. Connect your organizations with

Precision Strike. Consider event sponsorship. The PSA succeeds when companies get involved and people take an active role to facilitate communication on topics critical to the Precision Strike Community.

Visit our website at www.precisionstrike.org

Thank you for your involvement in the Precision Strike Association. We look forward to seeing you at PSTS-17!

Ken Masson
Chairman of the Board

PSTS-2017, cont. pg 1

General Seve Wilson—Air Force Vice Chief of Staff; **Vice Admiral Mat Winter**—F-35 Program Executive Officer; **Major General Bill Hix**—Director of Strategy, Plans and Policy, DCS G-3/5/7, Army Headquarters; **Rear Admiral Mark Darrah**—PEO for Unmanned Aviation and Strike Weapons; and, a host of 45+ additional dynamic visionaries, intelligence and engineering experts, technologists, and tactical operators who will enlighten you on strike challenges and warfare changes. Please **review page 15** of this issue for a full list of topics that will be addressed.

Highlights of featured leadership speakers are captured below:

- **General Wilson**, who presides over the U.S. Air Force Air Staff, will join us to keynote opening day to focus on **Nuclear Deterrent Modernization and Strategic Stability**. Earlier, we were privileged to hear from him when he served as the Deputy Commander, USSTRATCOM where he planned and executed strategic deterrence and global strike operations. He too is a command pilot with more than 4,500 flying hours and 680 combat hours.
- **Vice Admiral Winter**, a very long-time friend of the precision strike community, who is the Director, Joint Strike Fighter Program, will provide highlights of the **F-35 Lightning II Program**. He will talk about developing and acquiring the F-35A/B/C – the next generation strike aircraft weapon system for the Navy, Air Force, Marines and many allied nations. He has served operational, acquisition, and flag tours engaged with precision strike

weapons of critical importance to our Nation.

- **Major General Hix**, who serves as the Director of Strategy, Plans and Policy, Deputy Chief of Staff G-3/5/7 Army Headquarters, informs the Army senior leader decision making process to meet anticipated national security requirements. His responsibilities focus on developing, articulating, and advancing strategy, plans, concepts, and policies that **shape the geo-strategic security environment**. He earned the Special Forces and Ranger Tabs, the Combat Infantryman Badge (with Star) and other key badges.
- **Rear Admiral Darrah**, currently serving as the PEO for Unmanned Aviation and Strike Weapons, has addressed the precision strike community on many occasions. He plans to address **Innovations for the Next Generation Strike Capability** and will focus on weapons that must be able to strike diverse targets from all domains. Darrah has been recognized with numerous achievement awards including the Packard, Admiral Perry, and Association of Old Crow's Awards, as well as numerous Service Medals.

Other **not to miss** topics of discussion at PSTS-17 will focus on riveting technologies, innovations, requirements, challenges, and special operations and tactics that are the focus of today's national security initiatives on Capitol Hill, at the Pentagon, in the Middle East and elsewhere. An awesome 90 minute briefing will be presented by Admiral Scott Swift's Intelligence Officer that will focus on **Countering China's Competitive Advantage—specifically related to the South China Sea**. Further, both luncheon speakers are always most insightful

and very popular with precision strikers. If you represent the U.S. Government (Civilian and Active Duty), Industry, Small Business or Academia, you definitely should be engaged in this symposium. You are guaranteed to gain valuable insights that will prove to be very valuable in your future endeavors.

Again, the precision strike community is honored to be host for a great educational experience to numerous **Midshipmen** from the U.S. Naval Academy's Weapons & Systems Engineering Department and other departments.

And, please be aware that the **Ninth Richard H. Johnson Technical Achievement Award** will be presented during the Luncheon Ceremony on 25 October to **Scott O'Neil**—previous NAVAIR Executive Director for Research and Engineering NAWC-WD—who always ensured that our Warfighters had the right precision munition for the fight. ■



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Participate in Not-to-Miss Sessions

Joint Staff (J-2) Intel Assessments—Middle East, Russia, Iran, North Korea & China
 Defense Leadership Panels on Precision Engagement in the Current & Future Fights
 Joint Industry/Government Session on Offensive & Defensive Hypersonic Capabilities
 USSOCOM & AFSOC briefs on Special Operations & Tactics to Support the Warfighter
 U.S. Pacific Fleet Intelligence Officer's Awesome Detailed South China Sea Pitch

Join in Showcasing Critical Warfighter Needs

- Administration's Defense Rebuild Priorities
- Hypersonic Weapon Threat
- Targeting Support for Future Warfare Engagement
- Counter-Unmanned Aerial Systems (C-UAS)
- Electronic Warfare—Future Direction/Programmatic Impacts
- Lessons of America's Victory in the Cold War
- Strategic Capability Development—Creating the Future Force
- Nuclear Deterrent Modernization & Strategic Stability
- Innovations for the Next Generation Strike Capability
- Navy's Future Anti-Ship Capability
- F-35 in the High End vs Permissive Fights
- Shaping the Geo-Strategic Security Environment
- SOF Precision Strike Effects & Digitally Aided CAS in the Battlefield
- Defense Against Hypersonic Weapons
- Advanced Technologies & Upcoming Developments—National Labs Session
- Challenges and Opportunities for Mobile Missile Defeat Technology Development
- Land Based Anti-Ship Capabilities from Long Range
- Unique Challenges and Innovative Solutions for Maximum Impact
- Radical Islamic Terrorism
- Navy Requirements Deep Dive Panel

Special Award Ceremony

9th Richard H. Johnson Technical Achievement Award

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 please email: zmartinez@ndia.org*

The Precision Strike Digest is an important vehicle for the Precision Strike Association to share information and to engage in discussion. You have an opportunity to share your passion about a particular Precision Strike topic. The Precision Digest is published three times a year. Please contact PSA Chair for Communication John Sordyl (jsordyl@williams-int.com), if you would like to have an article included in The Precision Strike Digest.

Membership Application – Precision Strike Association

The undersigned, desiring to support and cooperate in the activities of the Precision Strike Association, applies for Membership:

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Annual membership dues are based on your organization's defense-related revenue. This includes both prime and subcontracts for products and services. Please select your dues category below.

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