2018 MUNITIONS EXECUTIVE SUMMIT

MUNITIONS READINESS AND MODERNIZATION:
MEETING CURRENT AND FUTURE WARFIGHTER NEEDS

April 16 – 18, 2018
Hilton Parsippany
Parsippany, NJ
NDIA.org/2018MES
MUNITIONS TECHNOLOGY DIVISION

WHO WE ARE
NDIA’s Munitions Technology Division works to maintain the open exchange of technical information among government and industry programs and technical managers, and to identify changes and trends in policy, guidance and organizational functions that affect the development, production, maintenance and demilitarization of munitions.

LEADERSHIP
Tim Bagniefski
Division Chair

WHO WE ARE
NDIA’s Munitions Technology Division works to maintain the open exchange of technical information among government and industry programs and technical managers, and to identify changes and trends in policy, guidance and organizational functions that affect the development, production, maintenance and demilitarization of munitions. As a 501(c)(3) corporate and individual membership association, NDIA engages thoughtful and innovative leaders to exchange ideas, information, and capabilities that lead to the development of the best policies, practices, products, and technologies to ensure the safety and security of our nation. NDIA’s membership embodies the full spectrum of corporate, government, academic, and individual stakeholders who form a vigorous, responsive, and collaborative community in support of defense and national security. For more information, visit NDIA.org

EVENT INFORMATION

LOCATION
Hilton Parsippany
1 Hilton Ct.
Parsippany, NJ

EVENT WEBSITE
NDIA.org/2018MES

EVENT CONTACT
K. Ashley Phayme
Meeting Planner
(703) 247-2540
aphayme@ndia.org

PLANNING COMMITTEE
Tim Bagniefski
Event Chair
Steve Cummings
Larry Fanning

EVENT THEME
Munitions Readiness and Modernization: Meeting Current and Future Warfighter Needs

ATTIRE
Business attire for civilians or uniform of the day for military personnel.
A survey and list of attendees (name and organization only) will be emailed to you after the conference. NDIA would appreciate your time in completing the survey to help make our event even more successful in the future.

In lieu of speaker gifts, a donation is being made to the Fisher House Foundation.

NDIA is committed to providing a professional environment free from physical, psychological and verbal harassment. NDIA will not tolerate harassment of any kind, including but not limited to harassment based on ethnicity, religion, disability, physical appearance, gender, or sexual orientation. This policy applies to all participants and attendees at NDIA conferences, meetings and events. Harassment includes offensive gestures and verbal comments, deliberate intimidation, stalking, following, inappropriate photography and recording, sustained disruption of talks or other events, inappropriate physical contact, and unwelcome attention. Participants requested to cease harassing behavior are expected to comply immediately, and failure will serve as grounds for revoking access to the NDIA event.

SURVEY AND PARTICIPANT LIST

SPEAKER GIFTS

HARASSMENT STATEMENT

AGENDA

MONDAY, APRIL 16

REGISTRATION – SPONSORED BY ORBITAL ATK

PRESSESSION

OPENING RECEPTION – SPONSORED BY BAE SYSTEMS OSI

NOBEL BALLROOM C

TUESDAY, APRIL 17

REGISTRATION – SPONSORED BY ORBITAL ATK

PRESSESSION

WELCOME AND INTRODUCTIONS

NOBEL A/B

Tim Bagniefski

Vice President of Marketing and Business Development, General Dynamics

Chairman, NDIA Munitions Division

Frank Michael

Senior Vice President, Programs and Membership, NDIA

OPENING REMARKS

NOBEL A/B

BG Alfred Abramson III, USA

Program Executive Officer- Ammunition

John Hedderich

Executive Director SES, ARDEC

JoEtta Fisher

US Army, JMC - Deputy Director, MLRC

2018 MES KEYNOTE SPEAKER

NOBEL A/B

LTG David D. Halverson, USA (Ret)

Chairman and CEO, Cypress International

NETWORKING BREAK – SPONSORED BY L3 DEFENSE

NOBEL ASSEMBLY

U.S. THREAT BRIEFING – UNCLASSIFIED

NOBEL A/B

Mike Santaspirt

US Army, RDECOM

US DOD BUDGET UPDATE & OUTLOOK

NOBEL A/B

Charles “Chick” Feldmayer

Senior Executive Service, Feldmayer Consulting

LUNCH – SPONSORED BY GENERAL DYNAMICS

NOBEL C/D

AMMUNITION ENTERPRISE CROSS-SERVICE UPDATE

NOBEL A/B

BG Alfred Abramson, III, USA

Program Executive Officer-Ammunition

Moderator

John Hedderich

Executive Director SES, ARDEC

Lt Col Greg Voth, USAF

Air Force Liaison and Principal Advisor, AFLCM/EBH

Scott Rideout

Program Manager for Ammunition, USMC

JoEtta Fisher

Deputy for MLRC, Joint Munitions Command
3:15 – 3:30 pm
NETWORKING BREAK – SPONSORED BY L3 DEFENSE
NOBEL ASSEMBLY

3:30 - 4:30 pm
"THE EYE OF THE STORM": ADDRESSING THE DRAMATIC INCREASE IN EXPLOSIVE REQUIREMENTS
NOBEL A/B
Kevin Knotts
CEO, Azimuth Consulting
Moderator
David Dunavin
Director and General Manager, General Dynamics - OTS
Michael Ervin
Director, Research and Development BAE Systems

Kevin McDonald
President, Chemring North America
COL Joseph H. Chan, USA
Project Director, Joint Services
Col Brad Tannehill, USAF
Project Director - Joint Products

4:30 – 5:00 pm
INDUSTRY UPDATES: ICAP REPORT AND MIBTF REPORT
NOBEL A/B
John McGuiness
President and CEO, American Ordnance, LLC
Nick Perry
Executive Director, MIBTF

5:00 pm
ADJOURN
NOBEL A/B

5:00 – 6:30 pm
RECEPTION – SPONSORED BY WINCHESTER AMMUNITION-MILITARY
NOBEL C BALLROOM

8:15 - 9:00 am
US ARMY CROSS-FUNCTIONAL TEAMS
NOBEL A/B
COL Will McDonough, USA
Project Manager, CFTs (Long-Range Precision Fires)

9:00 – 9:30 am
JOINT CAPABILITIES & ACQUISITION PRIORITIES
NOBEL A/B
COL Moises Gutierrez, USA
Chief CAD Division, OSD-J8

9:30 - 9:45 am
NETWORKING BREAK - SPONSORED BY L3 DEFENSE
NOBEL ASSEMBLY

9:45 – 11:45 am
PM ACQUISITION PANEL
NOBEL A/B
Bob Kowalski
Business Manager, Program Executive Officer- Ammunition
Moderator
COL Will McDonough, USA
Project Director, Joint Products
COL Joseph H. Chan, USA
Project Director, Joint Services
Joe Pelino
Director of Technology, ARDEC
Matt Zimmerman
Deputy Project Manager, Maneuver Ammunition Systems
William Sanville
Deputy Project Manager, Close Combat Systems

11:45 am - 12:00 pm
CLOSING REMARKS – ADJOURN
NOBEL ASSEMBLY
Tim Bagniefski
Vice President of Marketing and Business Development, General Dynamics
Chairman, NDIA Munitions Division

The NDIA has a policy of strict compliance with federal and state antitrust laws. The antitrust laws prohibit competitors from engaging in actions that could result in an unreasonable restraint of trade. Consequently, NDIA members must avoid discussing certain topics when they are together at formal association membership, board, committee, and other meetings and in informal contacts with other industry members, prices, fees, rates, profit margins, or other terms or conditions of sale (including allowances, credit terms, and warranties); allocation of markets or customers or division of territories; or refusals to deal with or boycotts of suppliers, customers or other third parties, or topics that may lead participants not to deal with a particular supplier, customer or third party.
BIOGRAPHIES

BG ALFRED F. ABRAMSON III, USA
Program Executive Officer Ammunition, Commanding General Picatinny Arsenal, New Jersey

Brigadier General Alfred F. Abramson III became the Program Executive Officer Ammunition and the Commanding General, Picatinny Arsenal on December 29, 2017, leading the mission to develop and procure conventional and leap-ahead munitions to increase the warfighter's combat power. Prior to this, Brig. General Abramson served as the Deputy Program Executive Officer Ammunition and Senior Commander Picatinny Arsenal.

Brigadier General Abramson was commissioned a Second Lieutenant in the Chemical Corps after graduating from the US Military Academy at West Point in 1969. He served as the Deputy, Joint Program Executive Officer for Chemical and Biological Defense.

His civilian education includes a Master’s degree in Chemistry from Johns Hopkins University, a Master’s degree in National Security and Strategic Studies from the Naval War College, and a Master’s degree in Strategic Studies from the Army War College.

He has been responsible for providing guidance and direction to an engineering and scientific community. He was also responsible for developing, directing and managing ARDEC investment strategies to ensure state-of-the-art facilities, people and equipment, as well as the center's extensive research, development and engineering efforts for fielding new ammo, munitions, and combat systems.

JOHN HEDDERICH
Executive Director, SES ARDEC, Munitions Engineering & Technology Center.

John F. Hedderich II was appointed as Director of the U.S. Army Research, Development and Engineering Center (ARDEC) at Picatinny Arsenal, New Jersey on February 6, 2015.

As Director, Mr. Hedderich provides strategic leadership and managerial accountability to ARDEC’s obligation of over $1.3 billion, 64 laboratories, and a workforce of over 4,000 government and civilian employees.

From June 2002 to October 2003, Mr. Hedderich served as Associate Technical Director (Systems Concepts and Technology) where he was responsible for developing and executing scientific and technological strategies for small, medium and large caliber weapons, ammunition, mines and countermine, non-lethal weapons and ammunition and special operations gear. He also served as Associate Technical Director (Systems Concepts and Technology) where he was responsible for the Armament Technology Base Program executed by ARDEC.

A career executive, he was appointed to the Senior Executive Service, the highest level of non-lineage service, in November 1998.

JOETTA FISHER
Director, Supply Planning Directorate HQ, Joint Munitions Command (JMC)

Ms. Joetta Fisher is the Deputy for JMC at Headquarters, Joint Munitions Command. She serves as the deputy to the Executive Director for Ammunition, with oversight in providing joint conventional munitions acquisition sustainment, readiness, and logistics direction for all U.S. military services and allies. She also serves as the Ammunition Management (CP-33) Career Program Representative for JMC.

From February 2014 to December 2015, she served as the Director of Supply Planning, a directorate that consists of approximately 60 personnel responsible for developing a consolidated and integrated supply plan for all JMC products and services, to include fielding logistics, financial integration, and demilitarization missions.

Ms. Fisher’s previous assignments at JMC include: the Deputy Chief of Staff for JMC; Chief, Readiness Assessment Division; and the Executive Director for Ammunition.

LTG DAVID D. HALVERSON, USA (RET.)
CEO Cypress International, Inc.

LTG David D. Halverson, USA (Ret.) became the Chief Executive Officer of Cypress International, Inc. in Alexandria, Virginia on 1 October. On 1 January 2016, he became the Chairman and Chief Executive Officer.

He grew up in Babbitt, Minnesota and graduated from the United States Military Academy with a Bachelor of Science Degree and was commissioned a second lieutenant in the Field Artillery. He attended the U.S. Naval Postgraduate School in Monterey, California, where he was awarded a Master of Science degree in Operations Research and Systems Analysis. He graduated from the Kenan-Flagler Business School’s Executive Development Program at the University of North Carolina.

Despite his active duty assignment was the U.S. Army Assistant Chief of Staff for Installation Management, where he transformed the business approach to the global installation management and programmed the $19B annual energy, general services, force protection, construction and quality of life programs for over 154 installations in the Total Army.

He has served in various staff and leadership positions including command at every level from Battery to Joint Command to the Commanding General of the U.S. Army Installation Management Command. He has served in Continental Europe, Asia, Korea, Panama, and South West Asia. His staff positions, focused on program development, testing, concept and concept development, strategic planning, cost benefit and risk analysis, with assignments as the Senior Military Analyst in the Joint Wargaming and Policy Division of the U.S. Southern Command in Panama, joint requirements and Army budget development in positions such as the Commanding Chief in the Office of the Chief of Staff of the Army, Program, Analysis, and Evaluation Directorate. He was the Central Command J3, Chief of Plans, and planned, coordinated, and executed war plans for OPERATION ENDURING FREEDOM and OPERATION IRAQI FREEDOM after 9-11.

He deployed as the Deputy Commanding General (Support) for the 4th Infantry Division for OIF 5/7. After his deployment, he assumed duties on the Army Staff, as the Director of Operations, Readiness, and Mobilization, G-3 and then became the Director of Force Development, G-8, where he developed the RD&E investment, modernization and equipping programs for the Army totaling $200B across the POM. He transformed the training and modernization as the Commanding General of the U.S. Army Fires Center of Excellence and Fort Sill, Oklahoma, where the Air Defense and Field Artillery merged.

under one post. Dave served as the Deputy Commanding General and Senior U.S. Army Training and Doctrine Command where the newest doctrine and concepts were developed, along with leader development, training and learning models programs were revamped.

His military education includes the Field Artillery Basic and Advanced Courses, the Armed Forces Staff College, the Army War College, and the British Higher Command and Staff College.
KEVIN KNOTTS
President and CEO
Azimuth Consulting Services

Kevin Knotts is the president and CEO of Azimuth Consulting Services and is a certified Project Manager Professional. Kevin has over 30 years’ experience in logistics, industrial engineering, and acquisition. The first 21 years were in Army logistics operations and acquisition as an Ordnance Officer. Kevin’s assignments were in both the Army’s wholesale logistics and field service organizations. His wholesale logistics experience was at the Tank and Automotive Command where he was a contracting/project officer, and later the Executive Officer to the Commanding General. His field service positions included, Army G4 Staff as the Readiness Branch Chief, Battalion Commander, and the 1st Armored Division DISCOM XO & S3. During Desert Storm, Kevin was the Executive/Operations Officer of the 66th Maintenance Battalion supporting the 10th Special Forces Group, Operations Support Command.

Kevin traded Army Green for Corporate Grey in 1998. He cut his teeth in consulting with PricewaterhouseCoopers, and IBM focusing on industrial base supply chain logistics and acquisition. Kevin then partnered with Dr. Jay Sculley (former Assistant Secretary of the Army for Acquisition Logistics and Technology at Home Engineering in 2004 and established a supply chain logistics group specializing in munitions. In 2005 Kevin moved his group to CSC and in 2013 Kevin established Azimuth Consulting Services. He is currently its president and CEO and continues to lead his management consulting company that specializes in supply chain logistics to include: supply chain management, industrial base assessments, acquisition, financial management, public private partnerships, and business process re-engineering.

Kevin holds a Bachelors of Arts degree in Economics from the Virginia Military Institute and a Masters Degree in Business Administration with a concentration in finance and accounting from Babson College. His military schooling includes the Materiel Acquisition Management Project Managers Course and Contract Management Courses required for an unlimited Procuring Contracting Officer’s (PCO’s) Warrant.

GENERAL DYNAMICS
Ordnance and Tactical Systems

General Dynamics Ordnance and Tactical Systems empowers the U.S. military and its allies with an extensive range of overarching product segments applied across all levels of strategic and tactical operations. A business unit within the Combat Systems Group of General Dynamics, we are a world leader in the manufacture of large, medium and small caliber direct and indirect-fire munitions; and a leader in the development and production of lightweight tactical vehicles, weapons and armament systems. The company designs and produces shaped charge and penetrator warheads; and manufactures precision metal components for missiles, rockets and composite structures for the commercial, aerospace and defense markets. The company also produces propellants and non-lethal and force-protection products; and provides explosive load, assemble and pack services for a variety of munitions, tactical missile and rocket programs. Our explosive array of capabilities and services include innovative engineering and design, advanced modeling, simulations, system integration and management, precision machining and forging, as well as testing and evaluation. Combining proven ammunition development and production capabilities with advanced research and development strengths in key technological areas, we continue to meet the needs of the armed forces of the United States, its friends and allies with the highest quality “best value” combat solutions. More information about General Dynamics Ordnance and Tactical Systems is available online at www.gd-ots.com.
BAE SYSTEMS

BAE SYSTEMS OSI
OPENING RECEPTION SPONSOR

Headquartered in Radford, Virginia, BAE Systems Ordnance Systems Inc. (OSI) operates the Holston and Radford Army ammunition plants in support of U.S. Department of Defense (DoD) and commercial requirements. In addition to production, OSI provides a host of ammunition related services including modernization program management, inventory management, and energetics research and development.

Holston Army Ammunition Plant is the single source for U.S. DoD high explosives. Portfolio product mix includes RDXs, HMXs, IMXs, and PBXs. Radford Army Ammunition Plant is the single source for high-volume U.S. DoD Nitrocellulose / Propellants. Portfolio product mix includes Nitrocellulose, single-base propellants, multi-base propellants and rocket propellants.

OSI is an innovation leader in next generation explosives and propellants development thru its robust IR&D program. OSI is an active supporter of U.S. DoD and commercial product development through a wide variety of CRAD programs. In addition, OSI has provided total Program Management for all modernization projects conducted at its two ammunition plants. This extensive program includes modernization planning, project management, design, construction, and prove-out of a wide variety of projects.

PacSci EMC
AGENDA SPONSOR

Pacific Scientific Energetic Materials Company (PacSci EMC) is the leader in energetic component / system technology and lean manufacturing. Whether you require defense or commercial pyrotechnic solutions, we work as a partner to address your unique program or technical needs. Off-the-shelf, semi-custom or fully-customized, our team takes a proactive approach, leveraging our decades of engineering and chemical experience throughout the design process. At PacSci EMC, we produce energetic solutions that work as commanded, when commanded, providing superior reliability and safe energetic performance.

Our production facilities in Chandler, Arizona and Hollister, California are comprised of more than 300,000 square feet, including engineering, manufacturing, and testing. We utilize the most comprehensive engineering design and analysis tools, including Solid Works 3D Modeling & Drawings, COSMOS Module For Structural & Static Analysis, ProEngineer 3D and have 3D printing capability onsite. In addition, we also incorporate industry-leading analytical tools such as PEPCAL, CHETA, OSLO and SYNOPSYS - all critical for product design and optimal performance.

At PacSci EMC, our engineering and design expertise supports multiple product lines, encompassing ESAD/ESAF, CAD/ PAD, Linear Explosives, Electronic & Laser Initiated Ordnance Systems (JLOS), Missile Attitude Control/Divert Thrusters, including cubicset and smallsat Modular Architecture Propulsion System (MAPS™). We also offer Vehicle Arresting systems and extreme environment oil exploration networked ordnance systems. PacSci EMC offers munition solutions for land, sea and air that aids in the support of the warfighter.

To find out more about our unique capabilities and products, please visit www.psemc.com

MUNITIONS INDUSTRIAL BASE TASK FORCE
AGENDA SPONSOR

The Munitions Industrial Base Task Force (MIBTF) is a consortium of defense companies formed to advocate for the continued health and viability of the Nation’s munitions industrial base. Created twenty five years ago in response to an existential threat, we have worked constantly to enhance the knowledge and understanding of decision makers and organizations in government and industry. That knowledge and understanding are key to ensuring adequate funding and policy support for sustainment of a responsive, capable U.S. munitions industrial base able to develop, produce, and support superior munitions for the U.S. and its allies. The Task Force is comprised of small, medium and large companies – and serves as the single unified voice on the status of the entire munitions industrial base, on concerns relevant to preservation of key capabilities for U.S. national security, and on recommended actions tailored to effect that preservation. The Task Force remains a strong, credible advocate for our industry in its interactions with the Department of Defense, the Congress, and other sectors of the total defense Industrial base.

REGISTER TODAY!
INTERNATIONAL EXPLOSIVES SAFETY SYMPOSIUM & EXPOSITION
August 6 – 9, 2018
Sheraton San Diego Hotel & Marina
San Diego, CA
NDIA.org/Intl-Explosives-Safety
THANK YOU TO OUR SPONSORS

- Winchester Ammunition
- General Dynamics
  Ordnance and Tactical Systems
- BAE Systems
- Orbital ATK
  Defense Systems Group
- L3
  Defense Electronic Systems
- Day & Zimmermann
  We do what we say.
- PACSCI EMC
REGISTER TODAY!

2018 ARMAMENT SYSTEMS FORUM

May 7 – 10, 2018
Sheraton Indianapolis Hotel at Keystone Crossing
Indianapolis, IN
NDIA.org/Armament-Forum
Project Director Joint Products
2018 Munitions Executive Summit

PM Panel Brief

18 April 2018

Colonel Brad Tannehill (USAF)
Project Director Joint Products
973-724-6487
michael.b.tannehill.mil@mail.mil
Project Director Joint Products
Portfolio Snapshot

BOMBS

- Navy and Air Force General Purpose Bombs
- Navy and Air Force Practice Bombs
- Prox Sensors, Fins and Lugs
- Navy and Air Force Penetrator Bombs
- Air Force Cast Ductile Iron Bombs

NAVY GUN AMMO

- Navy Gun Ammo
- Multi Option Fuze Navy
- 5”/54 Cal Gun Ammo
- Deck Gun firing 5”/54 Cal Ammo
- Projectiles and Propelling Charges

CAD/PAD

- Cartridge Actuated Devices
- Propellant Actuated Devices

ENERGETICS

- HMX
- RDX
- PBXN-9
- LX-14
- IMX 101
Main Priorities

• Support increased Military Service requirements for General Purpose and Penetrator Bombs

• Award new contracts for:
  – Tritonal-filled General Purpose and Penetrator Bombs
  – General Purpose Bomb Bodies
  – Cast Ductile Iron Bombs

• Complete First Article Testing and enter into production of:
  – BSU-33 Conical Bomb Fins
  – BDU-33 Small Practice Bombs

• Continue production of:
  – Tritonal filled MK84 2000 lb General Purpose Bombs
  – General Purpose Bombs (all variants)
  – BLU-109 2,000 lb Penetrator Bombs (dual source)
  – BDU-50 500 lb Cast Ductile Iron Bombs
  – BSU-33 Conical Bomb Fins
  – MK 76 Small Practice Bombs
  – DSU-33 Proximity Sensors

• Complete SMCA production of:
  – 5”/54 Cal Navy Gun Ammo Projectiles (all variants)
  – 5”/54 Cal Navy Gun Ammo Propelling Charges
Industrial Base Challenges

• Increased demand for General Purpose and Penetrator Bombs has resulted in unprecedented demand for some components above existing industrial capacity and increased requirements are expected to continue.

• Reduction in SMCA 5”/54 Cal Navy Gun Requirements will potentially be offset by planned Navy systems acquisition.

• We still need flexibility in both contracts and production facilities to absorb fluctuations in customer funding and continue to ask for your support as appropriate.
Funding Outlook

Spending Forecast:
- Increasing
- Consistent
- Decreasing

PBD19: Total Portfolio ~$1.2B

<table>
<thead>
<tr>
<th>Program Type</th>
<th>Funding FY19-FY23 $M</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Purpose Bombs</td>
<td>$791</td>
</tr>
<tr>
<td>Penetrator Bombs</td>
<td>$233</td>
</tr>
<tr>
<td>Cast Ductile Iron/Practice Bombs</td>
<td>$163</td>
</tr>
<tr>
<td>5&quot;/54 Cal Navy Gun Ammo</td>
<td>$0</td>
</tr>
<tr>
<td>Fuze/SENSOR Programs</td>
<td>$0</td>
</tr>
<tr>
<td>FINS Programs</td>
<td>$16</td>
</tr>
</tbody>
</table>

Represents Other Service Funding (Air Force and Navy)

4/10/2018
## Competitive Opportunities

<table>
<thead>
<tr>
<th>Product</th>
<th>Projected RFP Release</th>
<th>Projected Award Date</th>
<th>Dollar Amount</th>
<th>Contract Strategy</th>
<th>Contract Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>MK12 &amp; MK3 Pallets</td>
<td>3QFY18</td>
<td>4QFY18</td>
<td>$3.7M</td>
<td>SBSA</td>
<td>5 Year FFP</td>
</tr>
<tr>
<td>Nose Plugs/Support Cups</td>
<td>3QFY18</td>
<td>2QFY19</td>
<td>$1.2M</td>
<td>SBSA</td>
<td>2 Year FFP</td>
</tr>
<tr>
<td>MK45 Primers</td>
<td>3QFY18</td>
<td>2QFY19</td>
<td>$5.8M</td>
<td>Competitive</td>
<td>2 Year FFP</td>
</tr>
<tr>
<td>Cast Ductile Iron Bombs</td>
<td>4QFY18</td>
<td>1QFY20</td>
<td>$485M</td>
<td>Competitive</td>
<td>5 Year FFP</td>
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<tr>
<td>MK72/73/74 Bomb Cables</td>
<td>2QFY19</td>
<td>1QFY20</td>
<td>$2.1M</td>
<td>SBSA</td>
<td>5 Year FFP</td>
</tr>
<tr>
<td>BLU-109 Penetrator Bombs</td>
<td>3QFY19</td>
<td>2QFY20</td>
<td>$1.4B</td>
<td>Competitive</td>
<td>5 Year FFP</td>
</tr>
<tr>
<td>Small Practice Bombs</td>
<td>3QFY19</td>
<td>3QFY20</td>
<td>$91M</td>
<td>SBSA</td>
<td>5 Year FFP</td>
</tr>
</tbody>
</table>
Closing Message to Industry

• Thank you for your sustained commitment and support to the Ammunition Enterprise and the Joint Warfighter

• Overall, General Purpose and Penetrator Insensitive Munition bomb quantities are increasing, thereby necessitating the increase in demand for Tritonal-filled bombs to address surging requirements

• Energetics consumers - please plan early and make no assumptions

• Request your assistance in raising the quality of proposals submitted in response to Government solicitations

• Special thanks to GD-OTS, for their assistance in addressing the spike in General Purpose Bomb requirements
UNPARALLELED COMMITMENT & SOLUTIONS
Act like someone’s life depends on what we do.

Act like someone's life depends on what we do.
DoD Priorities on Modernization

- Build a more lethal force
- Lead innovation & leverage technology effectively
- Organize & innovate to win

Army Modernization focus: make Soldiers and units more lethal to win our Nation’s wars, then come home safely

RDECOM-ARDEC, as the Army’s RD&E lead for armaments directly supports the Modernization Focus
OBJECTIVES & OPPORTUNITIES

• OBJECTIVES
  • Extend range of surface fires
  • Engage imprecisely located, moving targets in a GPS denied, EW environments

• NEAR-TERM (2018-2023)
  • Advanced lightweight cannon
  • Supercharge propellant
  • High rate of fire autoloader
  • Unitary and Cargo projectiles
  • Counter adversary IADS

• FAR-TERM (2024+)
  • Range extension
  • Novel AM propellants
  • Collaborative engagement / re-targeting amongst multiple projectiles in-flight

Modernize a cannon for extended range, volume and increased missile capabilities to restore Army dominance in range.
OBJECTIVES & OPPORTUNITIES

• **OBJECTIVES**
  - Efficiently engage NGCV target sets at extended ranges for both manned and robotic platforms
  - Engage targets in a dense urban environment
  - Optimize armament systems for automation
  - Reduce cognitive load on the operator

• **NEAR-TERM (2018-2023)**
  - Advanced medium caliber armament system capable of target defeat
  - Precision “fire and forget” tank munition to engage threats at extended range
  - Semi automated engagement of targets
  - Lightweight 120mm Cannon with Autoloader

• **FAR-TERM (2024+)**
  - High elevation reduced recoil armament systems for increased effectiveness against multi-domain targets and in dense urban
  - Tank-fired ammunition that can achieve hyper-velocity at extended range
  - Velocity and Course correction technology for Ammunition that improves accuracy and lethality at extended range

*Develop prototypes that lead to the replacement of our current fleet of infantry fighting vehicles and later tanks in manned, unmanned & optionally-manned variants*
OBJECTIVES & OPPORTUNITIES

• OBJECTIVES
  • Aviation lethality with air launched effects
  • Holistic situational awareness & decision making
  • Full spectrum targeting

• NEAR-TERM (2018-2023)
  • Legacy medium caliber armament system integration
  • Advanced fire control leveraged from ground armament system
  • Open system armament architecture
  • Air burst for legacy & future weapons

• FAR-TERM (2024+)
  • Advanced countermeasure/decoy dispense module
  • Small caliber remote weapons station firing multiple munitions

Incorporate manned, unmanned and optionally-manned variant vertical lift platforms that provide superior speed, range, endurance, altitude and payload capabilities.
OBJECTIVES & OPPORTUNITIES

• OBJECTIVES
  • Provide advisement that enables Armament & Lethality capabilities across other modernization priorities
  • Serve as conduit between CFT and Other Transaction Authority (OTA) vehicles provided by ARDEC/ACC-NJ (i.e. C5, DOTC, DIUx)

• NEAR-TERM (2018-2023)
  • Swarming Munitions – Round to Round Communications
  • Munition In-Flight Communications – Command and Control (C2) to include Retargeting
  • Manned-Unmanned Teaming (MUM-T) – Unmanned Weapon System C2 and Positive ID

• FAR-TERM (2024+)
  • Leverage Artificial Intelligence, Machine Learning, and Big Data Lethality Enablers
  • Leverage Low Earth Orbiting Satellite Network Enablers
  • Leverage Non Traditional Waveforms for Machine-to-Machine Communications (LIFI, mmWave, etc.)

Develop expeditionary infrastructure solutions to fight reliably on the move in any environment
OBJECTIVES & OPPORTUNITIES
ASSURED POSITION, NAVIGATION AND TIMING

• OBJECTIVES
  • Mid-course guidance in GPS denied environments to enable range extension out beyond 70km
  • Terminal Guidance to enable engagement of imprecisely located targets at extended ranges

• NEAR-TERM (2018-2023)
  • Implementing Image Navigation w/ TRL-6 demo in FY18
  • Tactical grade Inertial
  • Multi-mode terminal seekers both Passive & Active
  • Converged RF solutions

• FAR-TERM (2024+)
  • Gun hardened nav grade inertial through gun launch

Develop expeditionary infrastructure solutions to fight reliably on the move in any environment
OBJECTIVES & OPPORTUNITIES

OBJECTIVES
- Provide Maneuver Short Range Air Defense (M-SHORAD) maneuver elements & base camp security

NEAR-TERM (2018-2023)
- Systems of System approach for defeat of Group 1 & 2 Unmanned Aerial Systems (UASs)
  - Effective low collateral, low cost warheads/ effectors
  - Precision Targeting capability
  - Low SWAP-C remote weapon system
  - Programmable airburst munitions

FAR-TERM (2024+)
- Defeat of Group 2/3 UASs using directed energy & guided munitions
- Squad level defeat of Group 1 UASs
- Cannon delivered defeat of aerial targets

Ensure our future combat formations are protected from modern and advanced air and missile delivered fires, including drones.
OBJECTIVES & OPPORTUNITIES

**OBJECTIVES**

- Fight, win & survive in a multi-domain environment now & tomorrow
- Treat the Soldier/Squad same as a combat platform
- Initially focus on the Close Combat soldiers

**NEAR-TERM (2018-2023)**

- Next Generation Squad Weapons (AR and Carbine)
- Small Arms Fire Control
- Next Generation Family of Ammo

**FAR-TERM (2024+)**

- Advanced Ballistics Technology
- Propulsion & Terminal Mechanisms
- Counter Defilade Technology
- Signature Reduction

Develop the next generation of individual and squad weapons; improve body armor... and develop a synthetic training environment...
TOP MUNITIONS NEEDS

- Extended Range Projectile Technologies
- Advanced Small Caliber Ammunition
- Air Burst for Medium Caliber Weapon Systems
- Additive Manufacturing for Energetics
- Power Sources for Indirect Fire Precision Munitions
- CUAS Munitions Fired From Fielded Systems
- Novel Warhead Materials
SUMMARY

• Army Modernization
  • Near-term capability
  • Developing prototype “systems” vs. component level
  • Incremental capability vs. disruptive

• Armaments portfolio is well positioned to support Modernization & transition to PORs

• Innovation exists across the Government labs, industry partners, academia & international partners
  • Must be exploited to maintain/regain overmatch
Project Director Joint Services (PD JS)
2018 Munitions Executive Summit

PM Panel Brief

18 APR 2018

Joseph H. Chan
Project Director Joint Services
PEO Ammunition
Picatinny Arsenal, NJ
973-724-5157
joseph.h.chan.mil@mail.mil
What We Do for the Ammunition Enterprise

Demilitarization
- Execute All DoD Conventional Ammunition
- R&D of New Capabilities
- Resource, Recovery & Recycle Program
- Ammunition Peculiar Equip

Coordinate and Integrate the DoD’s Single Manager for Conventional Ammunition (SMCA) responsibilities
- SMCA & Industrial Base Policy

Interface with the Services
- SMCA Service Issue Resolution
- SMCA Customer Survey
- Joint Ordnance Commander’s Group (JOCG) EXCOM Chair

Manage Industrial Base
- Update / Execute Strategic Plan
- Supply Chain Management
  - Implement Section 806, PL 105-261
  - Single Point Failure Program
- Industrial Committee of Ammo Producers
- Army Ammo Plant Production Base Support
  - Acquisition, Sustainment, & Modernization Strategies
  - Layaway & Maintenance of Inactive Facilities
  - Armament Retooling & Manufacturing Support
- GOCO Facility Competitions

- Manufacturing Technology
- Ammo Logistics R&D

18 April 2018 DISTRIBUTION STATEMENT A. Approved for public release; distribution unlimited (17 April 2018) PAO Log #366-18
PD JS Budget Outlook (FY18-FY23)

Ind Base Modernization
• FY18 Add: $100M
Total Mod Program: $429M

PAA
Demil

ARMS
MIF
LIF
PIF

Ind Base

RDT&E

• FY18 Add: $24M
Total LCPP Program: $30M

Ammo Log

LCPP

Dimil

PAA - Procurement of Ammunition Army
RDT&E - Research Development Test & Engineering
PIF - Provision of Inactive Facilities
MIF - Maintenance of Inactive Facilities
LIF - Layaway of Industrial Facilities
ARMS - Armament Retooling and Manufacturing Support
CAD - Conventional Ammunition Demil
APE - Ammunition Peculiar Equipment
LCPP - Life Cycle Pilot Process, RDTE 6.6
Ammo Log – Ammunition Logistics

Source: FY18 Appropriations Dated: March 2018
Main Priorities & Challenges

1. Modernizing Without Disrupting Production
   • PB19 adds $1.25B over FY19-23 for Production Base Support (PBS).
   • Additional tools needed to execute, i.e. Corps of Engineers and /or direct to an Architecture / Engineering Firm
   • Articulation of full PBS requirements to HQDA

2. Execute HSAAP Explosives Capacity Increase
   • RDX increase by FY23 / IMX increase by FY22
   • Understand implications of new National Defense Strategy on explosive capacity requirements
   • ANSOL remediation technical solution

3. Conclude SCAAP Facility Competition

4. Complete RFAAP Nitrocellulose Facility

5. Reducing Operations and Maintenance Costs of AAPs
   • Must incorporate new requirements affordably
   • Look for opportunities to reduce or better incentivize execution of existing requirements

6. Demilitarization
   • Restriction on demil of selected serviceable munitions drives uneconomical execution
   • Lack of stable funding limits flexibility in work-loading depots
Major Demil Stockpile Items

New Navy Projectiles IDIQ Contract:
Miscellaneous Rounds CLINs being Evaluated
16" Rounds CLIN Proposals Due 15 May 2018

*Stockpile: 387,162 tons ammo; 27,152 tons missile

*Data as of Feb 2018
Questions?
## ICAP Sector

<table>
<thead>
<tr>
<th>ICAP Sector</th>
<th>Sector Representative</th>
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### INDUSTRIAL COMMITTEE OF AMMUNITION PRODUCERS (ICAP)

**Agenda – 108th Meeting – 16 April 2018**

1300-1600 hrs (EST)

Parsippany, NJ

**Location:**
Hilton Parsippany  
1 Hilton Court  
Parsippany, NJ 07054

**Meeting Room:**
Elements Ballroom

**Dress:**
Civilian – Business  
Military – Duty Uniform

**NDIA POC:** Ms. Carol Dwyer (703) 247-2582

<table>
<thead>
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<tr>
<td>1230</td>
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| 1300  | Introductions & Opening Remarks                               | ICAP Chair  
PEO Ammo JMC                                                                    |
| 1310  | Action Item Review                                           | All                                                                             |
| 1315  | Holston RDX Expansion Status                                  | PD Joint Services/BAE Systems                                                    |
| 1335  | Explosives Prioritization and Scheduling                      | PD JS/PD JP/BAE                                                                 |
| 1355  | Local Clause Elimination                                     | PM CCS                                                                          |
| 1415  | Cyber Security Briefing                                      | Mr. Thomas JMC                                                                   |
| 1435  | Case Study in GOCO Performance Work Statement (PWS) Management| PD JS                                                                           |
| 1445  | Break                                                        |                                                                                 |
| 1455  | Industry Sector Reports                                       | ICAP                                                                             |
| 1550  | Round Table Discussion & Wrap Up                              | All                                                                             |
| 1600  | Adjourn                                                       |                                                                                 |
Industry- Government Panel
Munitions Executive Summit

“The Eye of the Storm”
Addressing the Dramatic Increase in Explosive Requirements
Panel Members

• Moderator:
  – Kevin Knotts – President, Azimuth Consulting Services

• Panel Members
  – Kevin McDonald – President, Chemring Ordnance
  – David Dunavin – General Manager, GD-Garland
  – Col. Joseph Chan – Project Director, Joint Services, PEO Ammunition
  – Col. Brad Tannehill – Project Director, Joint Products, PEO Ammunition
  – Mike Ervin – Director, R&D and Sales & Marketing, BAE Systems Ordnance Systems
The Eye of the Storm

- Intro and Background – Kevin Knotts
- Industry’s Perspective – Kevin McDonald
- Collaboration – the TNT Vignette – David Dunavin
- Addressing the Problem
  - Modernization of Holston AAP – Col Chan
  - Interim solution – Col Tannehill
  - BAE’s Commitment - Mike Ervin
- Questions
Our Storm - Background

HSAAP Requirements
- Bomb
- Artillery
- Rockets/Missiles
- Mortar
- Warhead
- Demo Products
- Fuzes

Source: MIBTF Pres. Budget 2019

Four fold increase in requirements

Missiles (Warheads & Propellant)

Source: MIBTF Pres. Budget 2019
“The Eye of the Storm”
Addressing the Dramatic Increase in RDX Explosive Requirements

Munitions Executive Summit - Panel Discussion
April 17, 2018

Kevin McDonald
President
Industry Perspective

• **Our Issues: Lack of Explosive Supply has resulted in:**
  - RFP compliance challenges from HSAAP –
    • HSAAP has been able to provide pricing
    • HSAAP has been unable to commit to a schedule during the bidding process
  - Production Planning/Scheduling – challenges
    • Upon award HSAAP committed to schedule for DPAS rated programs

• **Commercial (DMS) Explosives Significance**
  - Commercial contracts (Direct Military Sales) HSAAP estimates 18-24 months delivery at the earliest, probably later with non DPAS rated programs
  - Commercial work offsets overheads for lower prices on DoD work

• **Work Arounds / Mitigations**
  - Commercial work includes having customer accept alternate explosives (TNT or like) or using international suppliers for RDX explosives
  - Continue to allow responses to RFP’s to allow the following: “due to high demand of xyz explosive at HSAAP we can meet the customer schedule provided HSAAP can deliver on product by abc date”
  - Communication by DOD customers for their demand for explosives is communicated with HSAAP to allow delivery to the RFP winner.
Industry Perspective – Recommendations

• Communication concerning demand and delivery with all parties is critical
  – Industry with HSAAP
  – DoD with HSAAP
  – DoD with Industry

• DoD provides information to HSAAP concerning their requirements and deliveries to ensure there are placeholders for their specific explosive material

• DoD willingness to accept alternatives for existing RDX requirements (i.e. TNT, Tritonal, etc)
Collaboration – The TNT Vignette

Munitions Executive Summit - Panel Discussion
April 17, 2018

David Dunavin
General Manager Garland Operations
GD-OTS
TNT Requirements Surge Background

- Nitro Chem in Bydgoszcz, Poland is currently the only qualified TNT source for U.S. Bomb Programs

- As one of the world’s largest producers with maximum annual production up to 22,000,000 pounds of military grade TNT per year, Nitro Chem is facilitated to support sustainment of large, long-term production programs

- In 2016, the USG released a requirement for 40,000 MK-84 Tritonal Bombs requiring 31,800,000 lbs. of TNT from Poland for all 2017 – 2019 contracted deliveries

- A multi-year agreement was established in 2016 to support the MK-84 Bomb Kit Program with TNT deliveries from Poland directly to load, assemble, pack facility for production

- The GD-OTS U.S. TNT Distribution Agreement contains minimum and maximum TNT production capacity options for 2019 – 2022 to support the USG Tritonal Bomb Program Sources Sought, to which GD-OTS responded in 2016. Additional options have since been added to the Agreement to support other Programs
Collaboration to Manage Risk

- Collaboration with Joint Products allowed a structure to be put in place to protect McAlester Army Ammunition Plant (McAAP) bomb production.
- What once created risk to the General Purpose Bomb programs now impacts all USG ordnance programs.
- Utilization of TNT for approved ordnance products preserves the Holston capacity for other applications.
- Supporting the Joint Products investigation into the utilization of reclaimed RDX from demilled ordnance from our GD-OTS Joplin, MO facility to support commercial needs further preserving Holston capacity.
- Distribution of TNT can be further optimized through prioritization of USG Programs, collaboration of industry partners to collectively support production schedules, and proper Program allocations.
NOTES:
1) GD-OTS TNT agreement min / max annual requirement was intended to secure the USG’s urgent need TNT requirements for MK-84 and future TNT Bomb Programs, the current agreement allows for long-term USG capacity based on maximum annual production

2) Distribution of TNT can be further optimized through prioritization of USG Programs, collaboration of industry partners to collectively support production schedules, and proper Program allocation

Program Prioritization, Energetic Allocation, and Stakeholder Collaboration is the Path to Success
Modernization of Holston AAP – Col Chan

The Army’s Modernization Program at HSAAP
Project Director Joint Products
2018 Munitions Executive Summit

Explosives Panel Brief

Prioritization of HSAAP’s Workload

17 April 2018

Colonel Brad Tannehill (USAF)
Project Director Joint Products
973-724-6487
michael.b.tannehill.mil@mail.mil
Prioritization of HSAAP Workload

- Industry has identified extended lead times for obtaining explosive material from HSAAP.
- The current prioritization paradigm for HSAAP explosive orders of negotiating schedules, prioritizing deliveries, and awarding delivery orders on a first-come, first-served basis works.
- Conflicts may arise during schedule negotiations or after delivery order award when customers determine that explosive delivery schedules do not meet program requirements.
- Concerns have surfaced related to industry proposals that rely on explosives availability. Recommend identifying any concerns related to explosives deliveries that arise during proposal development / submission to the Procuring Contracting Officer.

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Prioritization of HSAAP Workload

To manage potential conflicts and address industry’s concerns, an IPT was established and has:

• Finalized a communication process by which prioritization conflicts will be identified to and managed through a single POC

• Generated a prioritization hierarchy by which potential conflicts will be adjudicated
  – DPAS rated orders, operational and industrial base impacts, service priority considerations
  – Attempts will be made to first manage conflicts within service specific trade-space
  – The process will not result in prioritization of a strictly commercial requirement over any requirement intended to support a DOD, FMS, or DCS program

• Developed a strategic communications (STRATCOM) message to the broad stakeholder base requesting they:
  – Plan for contract award of explosive requirements as early as practical
  – Prepare for extended explosive lead times
  – Manage delivery schedule concerns/conflicts through established US Government Program Management Office chains of command to the single POC
As Operating Contractor of the Holston (HSAAP) and Radford (RFAAP) Plants, Ordnance Systems (OSI) appreciates our relationship with the Army

- HSAAP - JMC - AMC - PEO Ammo - ACC - OSI (“It takes a Team!”)
- Investing in Holston AAP and Radford AAP as valued national assets
- Supporting today’s mission for energetic materials
- Ensuring readiness for needs of future generations

Elements of the overall HSAAP modernization

- **Expansion of capacity (RDX, HMX, IMX, etc)**
- New technology / capabilities
- Environmental compliance
- Safety
- Replacement of aging infrastructure
- Quality of workplace environment
The Perfect Storm –
Key Challenges During Program Execution

- Execution of Comprehensive Modernization / Capacity Expansion Program at HSAAP while …..
  - Running the plant at or near full capacity for most explosive products
  - Balancing deliveries of explosive products across the entire industrial and Customer base
  - Performing critical preventive and routine maintenance on operational infrastructure
  - Maintaining compliance with ever tightening environmental regulations
  - Ensuring safety and security of staff and facility
  - Advancing the development and scale-up of “next generation” explosive products
  - Modernization is the long-term solution to mitigate explosive capacity constraints
The Perfect Storm –
Path Forward for Addressing Capacity Challenges

Short-Term (ongoing):
- IPT and Lean Manufacturing teams working to maximize efficiency in existing operations (i.e. “getting the most out of what we have”)
- Curtained explosive production for true commercial markets (ex. oil /gas)
- Restructured maintenance shutdowns to maximize efficiency / reduce downtime
- Extensive Customer engagement, planning, coordination
  - Reduced size of production runs, JIT deliveries
- Scheduling & Prioritizing Production
  - DPAS ratings, receipt of orders, feedback from PMs, etc

Medium-Term (1-3 years):
- Evaluating OCONUS sourced RDX & HMX for select DOD applications
  - Qualify as feedstock in Holston FEM systems
  - Limits scope of qualification effort (primarily for bomb applications)
  - Frees up Holston produced RDX / HMX product for other applications
Questions