The Munitions Power Maze: OSD, JMP, JFTP, & More

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Supporting Dr. Chris Cross, OUSD(AT&L)/TWS/LW&M

The Future of Munitions Batteries Workshop
Army Research Lab
December 7, 2016
Outline

• Overview of OSD Interest in Munitions Batteries
  • Office of Land Warfare & Munitions (LW&M)
• Joint DoD/DOE Munitions Program (JMP)
  • Technology Coordinating Group (TCG)-V: Power Systems Technology
• Joint Fuze Technology Program (JFTP)
  • Fuze Area Technology Groups (FATGs)
• DoD Reserve Power Sources IPT/Coordination Study
• Note: Services & Agencies have research & acquisition activities which are NOT covered here
LW&M Office Programs & Initiatives

• Joint DoD/DOE Munitions Program
  – OSD Technical Director: Chris Cross, LW&M
  – Modeling & Simulation Initiative Coordinator: Kirk Vanden, AFRL-Eglin
  – Insensitive Munitions Project Arrangement with UK: Steve Collignon, NWSC-Dahlgren

• Joint Fuze Technology Program
  – OSD Manager: Charles Kelly, LW&M
  – Program Manager: Lawrence Fan, NSWC-IHEODTD

• DoD Reserve Power Sources IPT Study
  – OSD Coord.: Christine Michienzi, Manuf. & IB Policy

• Joint IM Technology Program
  – OSD Manager: Kathryn Hunt, LW&M
  – Prog. Man.: Anthony Di Stasio, ARDEC

• Conventional Weapons Roadmaps & Munitions Requirements Process
  – OSD Lead: Charles Kelly, LW&M

• Joint Ground Robotics Enterprise
  – OSD Manager: Shad Reese, LW&M

• Critical Energetic Materials Initiative
  – OSD Lead: Kathryn Hunt, LW&M
  – Chair: Jamie Neidert, AMRDEC

• FY18/19 IMSPs
  – OSD Lead: Kathryn Hunt, LW&M

• Design for Demil. Implementation
  – Coordinator: George Kopcsak
Joint DoD/DOE Munitions Program
• Management and Oversight Structure •

Joint Fuze Technology Program
JFTP
- JFTP Manager: Lawrence Fan
- OSD Manager: Chuck Kelly
- 4 Technology Groups
  - FATG I
  - FATG IV

Joint IM Technology Program
JIMTP
- JIMTP Program Manager: Anthony Di Stasio
- OSD Manager: Kathryn Hunt
- 5 Technology Groups
  - MATG I
  - MATG V

Joint DoD/DOE Munitions Program
JMP
- OSD Technical Director: Chris Cross
- 8 Technology Groups
  - TCG I
  - TCG XIV

TECHNICAL ADVISORY COMMITTEE (TAC)
Jose Gonzalez, LW&M, Chairman

DOD Senior Level S&T Managers and PEOs

DOE/NNSA/DP
Senior Level Managers & Lab JMP Managers

MOU
Joint DoD/DOE Munitions Program

LW&M Office: Industry Consortia

• Other Transaction Authority (OTA) •

- DoD Ordnance Technology Consortium (DOTC)
  - 220+ industry & academic members in National Armaments Consortium (NAC)
  - OSD Manager: Steve Tretiak, LW&M
  - DOTC Program Manager: Don Geiss, ARDEC
  - Technology Transition Opportunities from JMP and other Programs

- Robotics Technology Consortium (RTC)
  - 105 members
  - OSD Manager: Christopher O’Donnell, LW&M
  - Program Manager: Michael Del Rose, TARDEC

- DoD Future Vertical Lift Consortium
  - 93 members
  - Manager: Dan Bailey, Army
  - Agreements Officer: Morgan Ross, ARDEC
Joint Munitions Technology Programs

• FY16 Performers •

Lawrence Livermore National Lab, CA

Reynolds Systems Inc., CA

California Polytechnic State University, CA

ERC Inc., CA

NAWC China Lake, CA

NTS China Lake, CA

Nammo Talley Mesa, AZ

Los Alamos National Laboratory Sandia National Laboratories, NM

AFRL Edwards AFB, CA

MCAAP OK

NTS Camden, AR

AFRL Eglin AFB, FL

Gunter Eng Niceville, FL

Expal Mindon LA

U of M MI

BAE Holston TN

ATK ABL, WV

Advanced Technology Institute, VA

Dynetics Huntsville, AL

AMRDEC Redstone Arsenal, AL

Morgan Research Group Huntsville, AL

NAWL Engineering CT

ARDEC Picatinny Arsenal, NJ

Leidos Dover, NJ

NSWC Dahlgren, VA

ARL APG, MD

NSWC IHEODTD Indian Head, MD

ATK, MD

Nova Research, MD

Aerojet, VA

Aerojet AR

ATK Radford, VA

ATK, UT

U of M MI

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Strengthening government-industry partnerships
Joint DoD/DOE Munitions Program (JMP): 31 Years of Joint-Interagency Cooperation

1985 DoD/DOE Memorandum of Understanding (MOU):

- Established a cooperative, stable, level-of-effort, applied R&D program in munitions technology

- Technologies & problems of mutual interest; jointly funded

- Work performed at DOE/NNSA national security laboratories; “the program is jointly planned and monitored by the DoD and the DOE”

- Work to be of a basic, general purpose and long-term nature ….in contrast to more specifically-focused work-for-others
JMP has Eight Technology Coordinating Groups (TCGs)

TCGs can be created and closed as DoD & DOE needs change

No requirements for NNSA Labs participation in all or in particular TCGs

All Services/DoD organizations are encouraged to participate

Budget is not allocated per TCG

Budget allocation is at Lab PMs’ discretion with TAC approval

TCGs

I: Computational Mechanics & Material Modeling
III: Energetic Materials
IV: Warhead & Integration Technology
V: Power Systems Technology
X: Firing Systems
XI: Penetration Technology
XIV: Munitions Reliability & Lifecycle Technology

33 Projects scheduled for FY17 at LLNL, LANL, & SNL
Joint Fuze Technology Program (JFTP)

• R&D Projects Organized into 4 Fuze Area Technology Groups (FATGs)
  • FATG-I: Hard Target Fuzing
  • FATG-II: Tailorable Effects
  • FATG-III: High Reliability Fuzing
  • FATG-IV: Enabling Fuze Technologies
    • Improved fuze power sources (power, energy density, rise-time, size reduction)
John DoD Reserve Power Sources IPT/Coordination Study – Background

- Chris Janow’s plea/recommendation at 2015 TAC Meeting to create a DoD Reserve Power Sources Integrated Product Team (IPT)
- Christine Michienzi (Senior Industrial Analyst – Missiles and Munitions, OUSD(AT&L), Manufacturing and Industrial Base Policy) tasked to develop Business Case Analysis (BCA) for an IPT
  - Reached out to gov’t SMEs – formed Working Group
    - Air Force, Army, Navy, MDA, OSD, DOE/NNSA
  - Gathered information and data for BCA
    - Background
    - Issues – for current and future munitions
    - Industrial Base limitations and risks
    - Conclusions & Recommendations made to TAC in August 2016
  - Use DoD Fuze IPT as a model ...
    - IPT would interface with Industry in a similar manner
DoD Reserve Power Sources
IPT/Coordination Study - BLUF

• Future weapons systems need to be faster, fly further, have increased targeting capabilities, and be smarter and smaller to meet increased threats
  – Many of these system needs are dependent on the availability of improved power sources, which are mainly reserve batteries
  – Active batteries do not meet munitions’ requirements for these applications

• The current reserve battery industry is challenged to meet technology, manufacturability and reliability needs
  – Numerous government assessments over the last 20 years have identified this technology area as having a high risk of being unable to meet future requirements

• This Business Case Analysis has confirmed the previous conclusions and identified a need for improved coordination and collaboration among government agencies and industry
• Manufacturing Challenges
• Design & Performance Limitations
• Material Supply Concerns
• Industrial Base Stability
• Requirements for future Weapons Systems More Demanding
The government reserve power sources community is relatively small and not well integrated.

The lack of a cohesive vision and effort among the government is hurting the limited reserve power sources IB, which is leading to a stagnant environment for reserve battery technology advancements.

DoD power needs are not diminishing; weapons technology is expanding, pushing new combat capabilities and creating new battlespace advantages and tactics.

A coordinating body (e.g., IPT) would be very beneficial to focus the community and bring a critical mass together to address the problems noted above.
Potential IPT Roles and Responsibilities

• Identifying and prioritizing issues for senior Service and DoD leadership, recommending investments, and optimizing resource allocations to improve technologies and the industrial base (IB)
  – Example: Most DoD programs have needs for specialty battery materials that risk supply interruptions due to small quantities; with proper coordination, multiple programs could acquire materials in large enough quantities to motivate sustained supplier production and investment

• Status: Mr. Gonzalez awaiting input from TAC/DoD Lab Executives on need for IPT
Questions?