Next Generation Fuzing for Next Generation Weapons:

All it takes is Communication, Cooperation, and Collaboration

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Agenda

- **Today's Challenges**
- **Looking Back**
- **Way Forward**
- **Summary**

Environmental Challenges

- Reduced S&T and Procurement budgets
  - **Fewer weapons and fuzes purchased overall**
  - **Struggle to protect existing/planned S&T funding and programs**
  - **Struggle to preserve technical capabilities – people and infrastructure – government and industry**
- Target sets, IM and miniaturization have decreased the tolerance for error margins
- New fuze systems/procurements are not stand-alone, separately identifiable programs: fuzing subordinate to weapon system primes

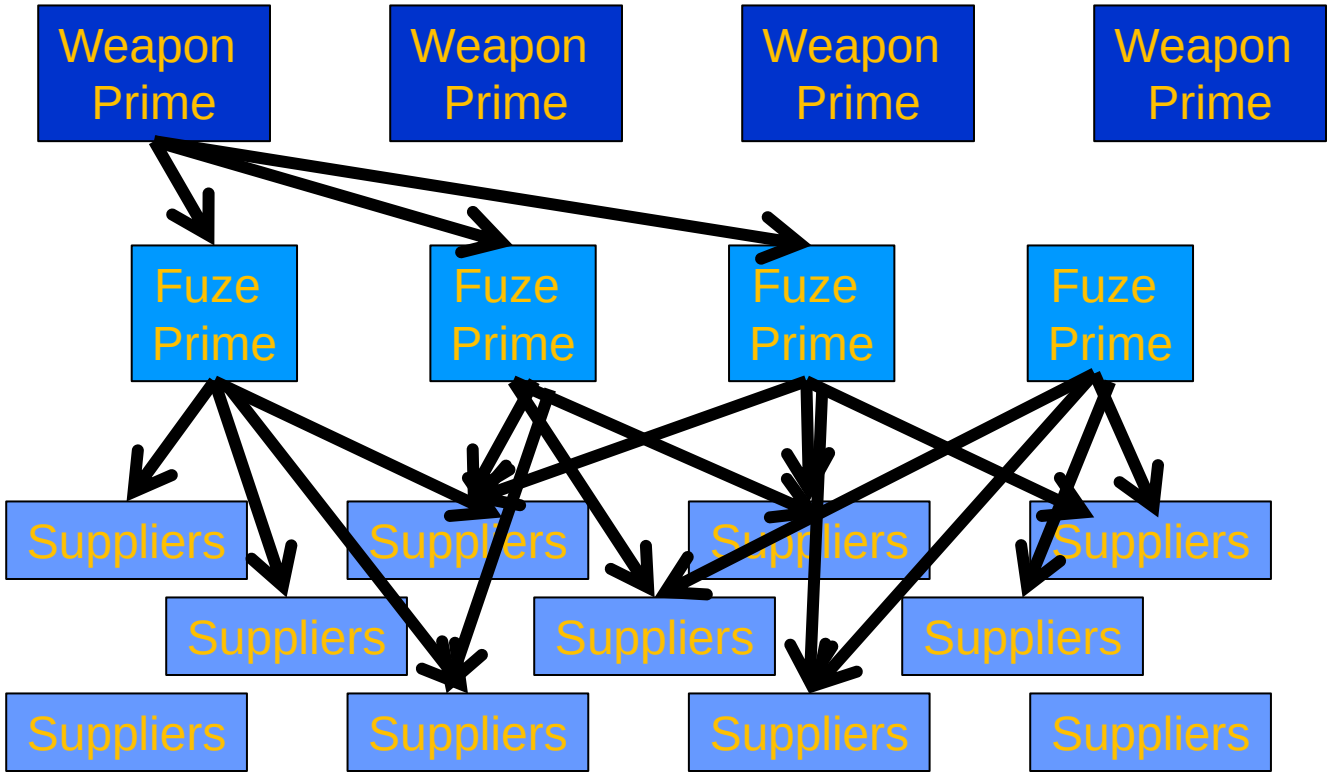
How do we advance fuzing under these conditions?

Technical Challenges

- Fuzing to attack hardened and deeply buried targets
- Upcoming deadline for 99%+ submunition reliability
- Reduce collateral damage from weapons
- Integration and qualification of fuzing explosive trains that are compatible with Insensitive Munitions warheads
- High level of fuze & weapon integration/intra-dependence requires very good system engineering processes between prime and fuze sub
- How to transition next-generation technologies such as MEMS S&As into fuze manufacturers and weapons

How do we ensure Manufacturability and Reliability of new technologies and components?

Industrial Challenges



Industrial Challenges

- Weapons Primes
  - Fuzing considered late in the system development process
  - Assignment of risk for low-volume but complex programs
  - Difficult competitive market/Fixed-price development programs
- Fuze Prime
  - Excess capacity in the base
  - Government insight & oversight: adequate or oppressive
  - Contract quality requirements versus value added to the program
- Shrinking components supplier base
  - Energetics materials and components (TATB, lead azide, lead styphnate, electro-explosive devices)
  - Power supplies
  - Obsolete electronics components

How do we maintain a healthy and competitive technology and industrial base?

Looking Back – Some History

- Contraction and Consolidation throughout the 1990's
- Fuze Studies leading up to the Fuze IPT
  - Institute for Defense Analysis Study 1999 – Missile, Bomb, and Projectile Fuze Subtier Study
    - Conclusion : While there is an awareness of the erosion of the industrial base, no evidence of DoD wide monitoring/control of this dwindling resource
  - 2000 Picatinny Sponsored Fuze Industrial Base meeting with all services and industry
    - Conclusion : OSD recommended with concurrence from the Services that an IPT should be stood up
- ….this lead to the formation of the Fuze IPT in 2001

Looking Back – Some History

DoD Fuze IPT Strategic Initiatives

Advance and Maintain:

- A Healthy U.S. contractor base
- Government support development, production, and sustainment
- U.S. Government and Industry fuze technology base with focus on transitioning technologies to the industrial base

Looking Back – Some History

Defense Ordnance Technology Consortium (DOTC)

Vision

- *An integration of Government, Industry, and Academia into a single enterprise executing Joint and co-funded initiatives, sharing and developing goals and objectives, resources and assets, and utilizing existing personnel, facilities and equipment*

Mission

- DOTC's mission is to demonstrate feasibility and/or the transition of Advanced Explosives, Propellants, Pyrotechnics, Warheads, Fuze/Sensors, Demil, Joint IM, Protection & Survivability and Enabling Technologies through Prototype Initiatives
  - Rapid technology transfer to the Warfighter
  - Advocates a critical mass of world-class technologists
  - Leverages government, private industry and academia R&D resources
  - Promotes nontraditional defense contractor involvement
  - Promotes innovation

Next Generation Fuzing
The Way Forward

"In the last downturn, companies that hunkered down did the worst in delivering shareholder value. Defense companies need to do more than just muddle along…they need to develop disruptive products. Weapons manufacturers have to invent the next big thing that the Pentagon ultimately will not want to live without."

Doug Belair, Senior VP Strategy
BAE Systems Inc.
National Defense, May 2012

"And so, my fellow Americans: ask not what your country can do for you — ask what you can do for your country."

John F. Kennedy
Inaugural Address
January 20, 1961

Next Generation Fuzing
The Way Forward

Communicate, Cooperate, Collaborate:

- **Strengthen Technology Collaboration between Industry, Services, DoD (JFTP), DOE**
  - Coordinate Technology and IRAD investments and roadmaps – Fuze IPT forum and DOTC Collaboration Days
  - Industry provide input to fuze technology needs/gaps – i.e. DOTC annual plan
- **S&T Transitions**
  - Gov't and Industry invest and drive the technology efforts to ensure MRL's are sufficient to transition for producibility and affordability
  - Coordinate on technologies to meet critical component gaps – limited supplier base, obsolescent and military unique parts (initiators/energetic materials, electronics)

Next Generation Fuzing
The Way Forward

Communicate, Cooperate, Collaborate:

- **Participate and Provide Feedback to Fuze IPT initiatives**
  - Fuze Acquisition and R&D Roadmap
  - Annual Fuze Industrial Base surveys
  - Gov't and Industry information exchange forums
- **Identify and address shortfalls with critical fuze sub-components**
- **Ensure safety and "ility" requirements are well understood**
  - Changes to standards and requirements are conveyed
  - Safety review board processes and expectations are understood

Next Generation Fuzing
The Way Forward

Communicate, Cooperate, Collaborate:

- **Government:** figure out ways to downsize and remain viable by leveraging the capabilities of your sister labs and/or industry – the whole is greater than the sum of its parts.

- **Industry:** take initiative beyond what you are doing today. Be an active participant in the US Fuze community. Try to increase your IR&D in support of DoD objectives. Partner with government and/or other members of industry to advance and maintain the state of fuzing in the U.S..

Summary

- **With declining budgets it is imperative that the fuze community – government and industry -- work together to realize the promise of Next Generation Fuzing**
- **The mechanisms are there to make it happen: the Fuze IPT and DOTC**
- **All it takes is initiative to: Communicate, Cooperate, and Collaborate**

Questions?