Mixing and Extrusion Trends in the US Army

1-2 May

JOCG Continuous Mixer and Extruder User's Group

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Outline

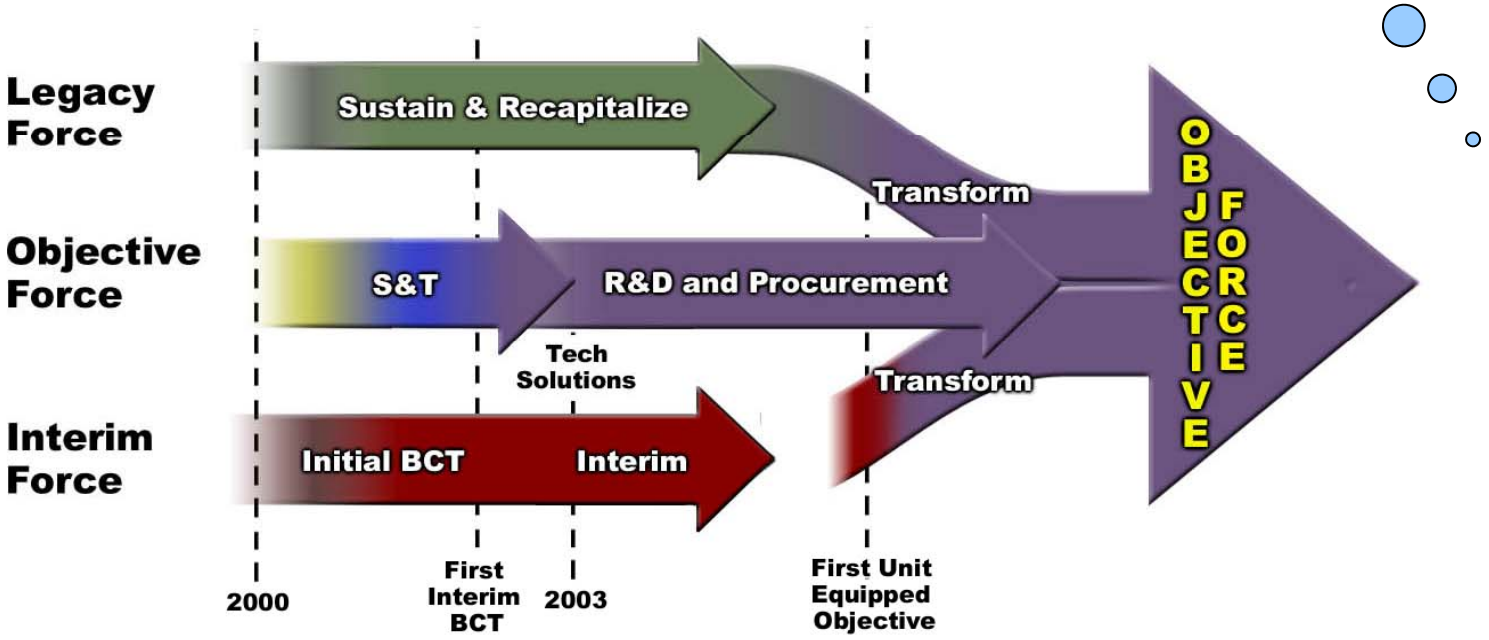
- Results of Survey
- Army Transformation and What It Means to Us
- ManTech/Producibility Program

Survey Results

- **Responses 12 of 40+**
- **Findings**
  - Continue meetings
  - Least Favorite topics
    - Other types of mixers
    - Sensors
    - Casting equipment
  - Panel Discussions and Forum on ManTech 50/50
  - Handbook is a good idea – few want to participate
  - Proceedings on a CD
  - Better communications – like the idea of SIT setting up a home page

Army Transformation and What It Means to Us

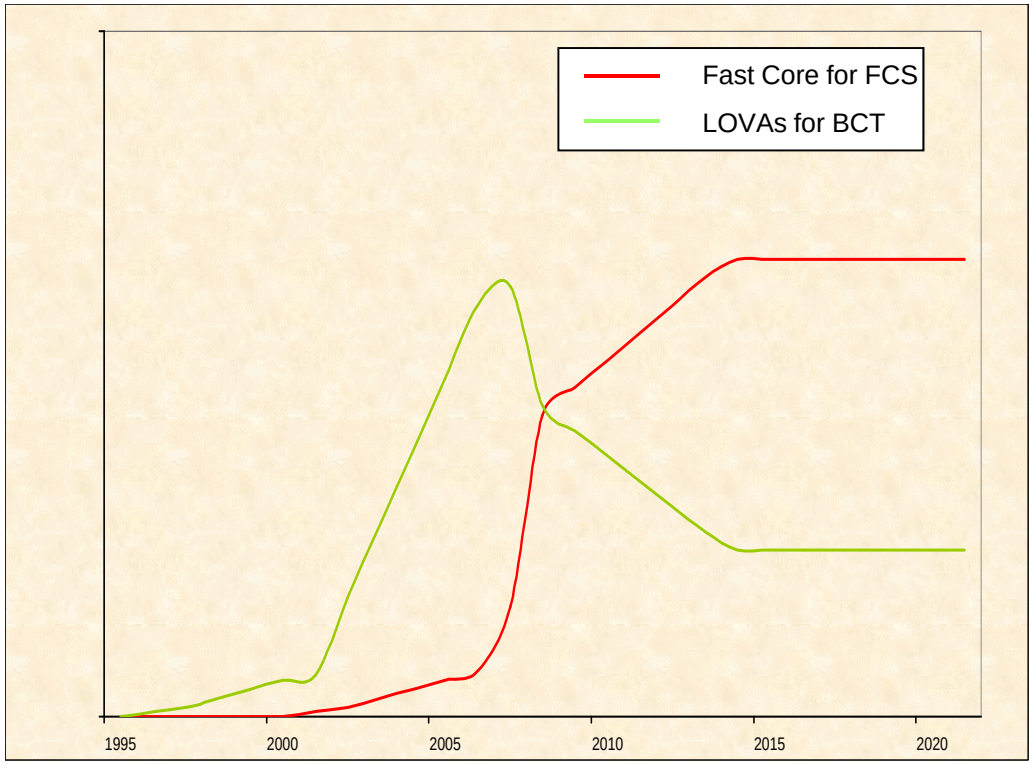
Advanced Propellants Needed to Meet Objective Force Requirements



. . . Responsive, Deployable, Agile, Versatile, Lethal, Survivable, Sustainable.

New Product Insertion

Introduction of Nitramine (LOVA) and Fastcore Type Propellants ---



Shift from conventional NC based propellants to high energy/highly filled solids propellant formulations for FCS and BCT will require investment in new processing technology (TSE or equivalent). New propellants may impact facility layout (Q/D considerations)

Legacy NC based propellants in support of fielded artillery systems, training, Crusader (MACS) and tank ammunition will continue to represent the primary production demand for the foreseeable future.

Technologies and Products

Candidate Technologies

- Twin-screw mixer extruder (TSE) for highly filled materials
- Modeling & Simulation in support of process optimization
- Fastcore geometries
- Open Modular Architectural Control (OMAC)
- Model-based Control (MBC)
- Fiber-optics for Communication and Data Transfer

Future (Projected) Systems

- Crusader (155-mm artillery)
  - ✓ TPE based
- Future Combat System (FCS)
  - ✓ GEN26
  - ✓ JA2 variant
- Brigade Combat Team (BCT)
  - ✓ Nitramine based propellants (XM39 or M43)
- 120-mm cannon
  - ✓ M14 & JA2 variants
- Objective Individual Combat Weapon (OICW)
  - ✓ Ball Powder
- HYDRA 2.75-inch Rocket
  - ✓ Composite min smoke

ManTech/Producibility Projects

ManTech Programs must be Awarded Competitively; Cost Sharing is an Evaluation Factor

FY02 and Beyond Requirements Unfunded

Propellant Related ManTech Programs -----

Title	Fiscal Years	Program Cost	Benefits
CL-20 & PAX-2A energetic Manufacture	FY99 - FY01	$3.5M	1, 2, 3, 4, 5, 6, 7
Shear Roll Mill Modeling	FY00 - FY01	$1.3M	1, 2, 3, 4, 6
Propellant Cutting	FY00 - FY01	$0.6M	3, 4, 6
M206 Flare Manufacture	FY00 – FY01	$0.5M	1, 2, 6
Twin Screw Mixer Processing for FCS Propellants	FY00 - FY04	$3.5M	1, 2, 3, 4, 5, 6, 7
OMAC & MBC RDX Crystallizer	FY01 - FY02	$3.8M	1, 2, 3, 4, 5, 6, 7
ETPE Process Optimization for FCS	FY01 - FY03	$2.7M	3, 4, 6
Modeling & Simulation f/Affordable Energetics/ Munitions Manufacture	FY02 - FY04	$12.0M	3, 4, 6
Fast Core Propellant Finishing for FCS	FY02 - FY05	$3.5M	3, 4, 6
Processing of Single Base Prop w/Twin Screw Tech	FY02 - FY03	$0.7M	1, 2, 3, 4, 6

1 - Improved Process Agility
2 - Safety/Environmental
3 - 21st Century Production Base
4 - Improved End Item Quality
5 - Medium Brigade
6 - Reduced Costs
7 - Reduced Log Footprint

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