Office of the Product Manager for Mortar Systems

Precision Effects Branch

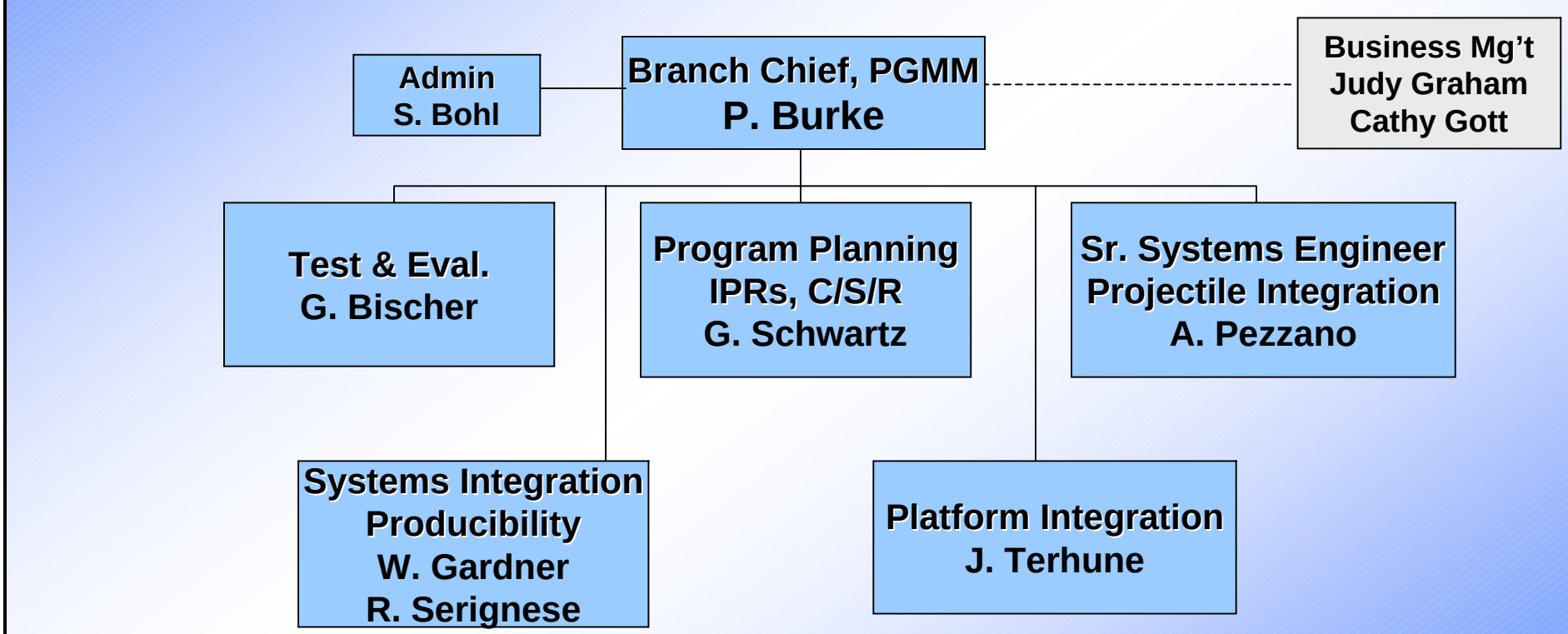
Pete Burke

Mission

Develop, Acquire, Produce, Field, Sustain, and Improve **Precision Mortar Effects**.

Current & Future Force

Organization



How We Operate

Inputs

Technology

Program Management

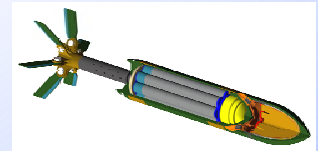
User Requirements

Balance

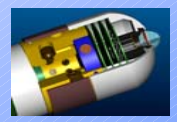
Balance cost, schedule, performance, and risk

Outputs

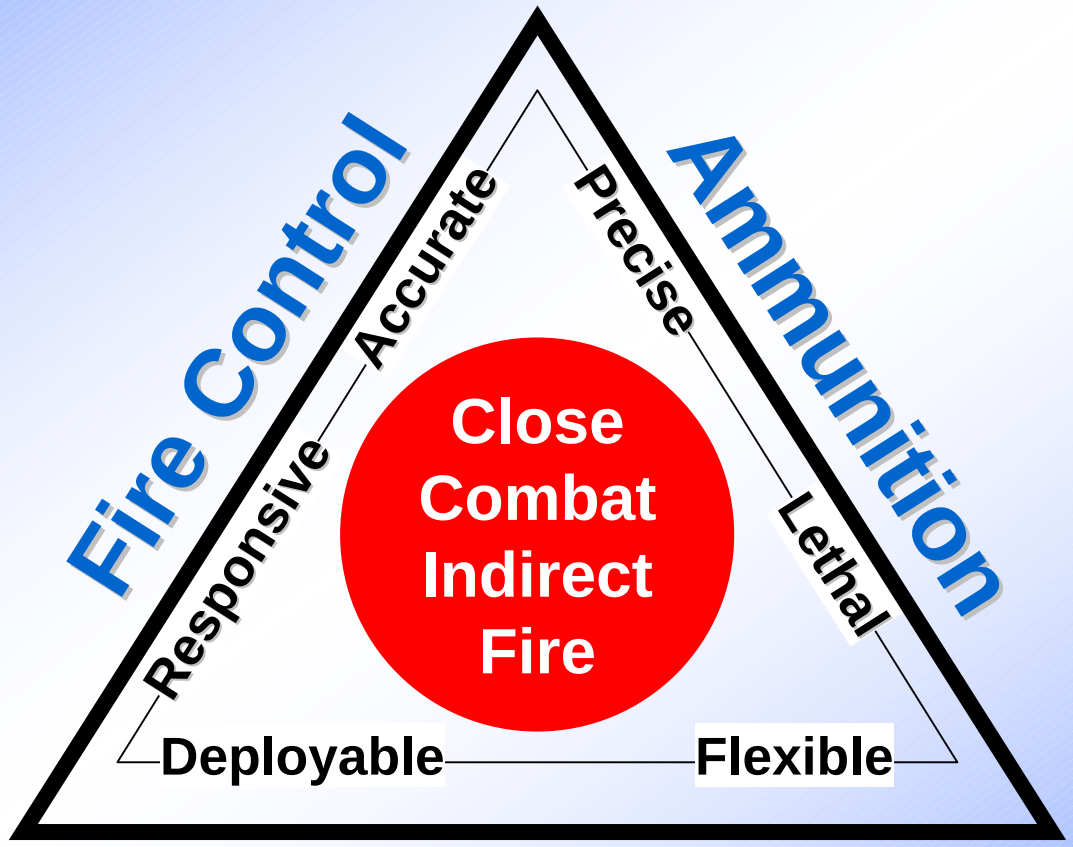
PGMM



Lethal
Advanced
Affordable
Systems



Mortar Systems Triad



Goal: Precision Effects for Close Combat

Future Weapon Systems

Current

120mm Carrier Mounted

120mm Ground Mounted

60mm

81mm

Arms Room Concept

- **Add 120mm mortar to Light Divisions at Battalion level**
- **Provides Battalion Commander flexibility through full spectrum of conflict**

Future

NLOS Mortar

FCS Lightweight Dismounted Battalion Mortar

Future Ammunition

Current

- 3 families of Ammunition
  (120mm, 81mm, 60mm)
- Highly Flexible
  - Suppression, Obscuration, Illumination
- Area Weapon – Large CEP
- Drop Fired
- Multi-Option, Hand Settable Fuzing
- Max Range 7,200 Meters (120mm)

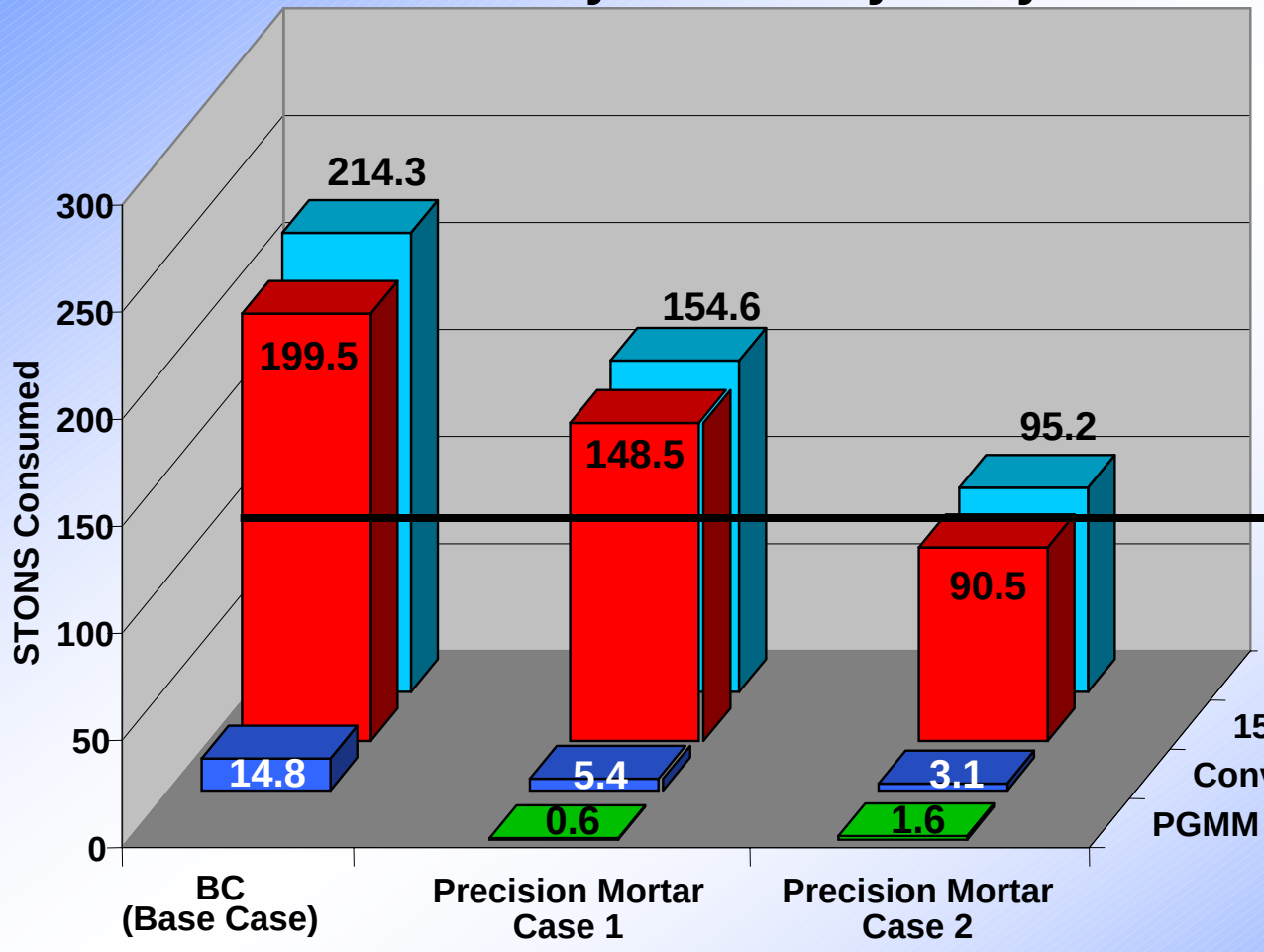
Future

- Adds Precision
  - High Priority Targets
  - Most Dangerous Targets
  - Low Collateral Damage
- Improved Conventional Effects
- Breech Loaded
- Automated Loading/Handling
- Extended ranges (12-15 km)
- Non-Lethal Effects
- Unattended Ground Sensors

New Family of Extended Range 120mm Mortar Munitions!

Precision Benefits Logistics

Analysis of Early Entry Force Scenario



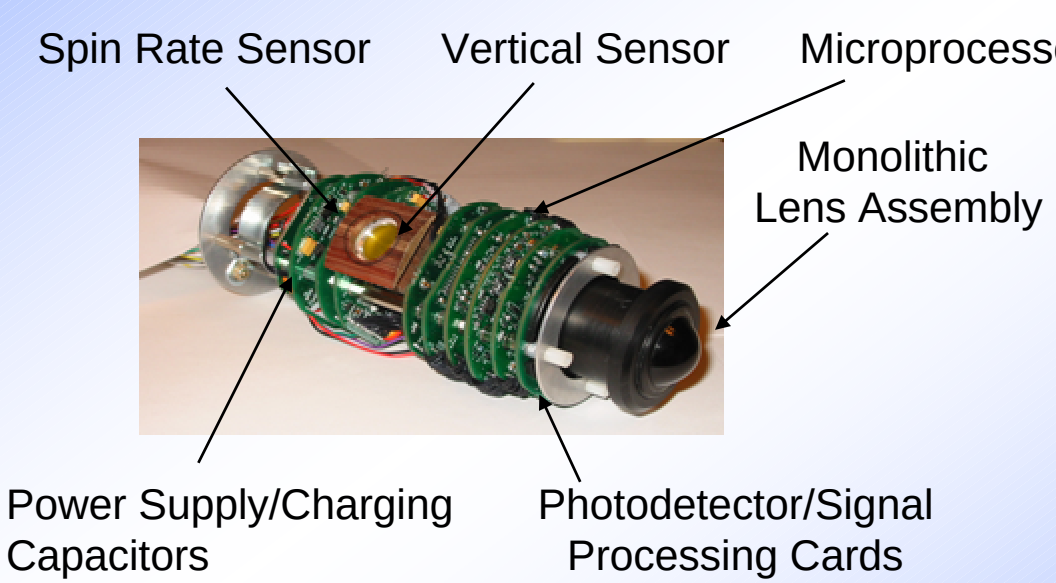
	Base Case (STONS)	Precision Mortar Case 2 (STONS)
TOTAL	214.3	95.2
155mm	199.5	90.5
PGMM	0	1.6
120mm	14.8	3.1

3 Days of Supply

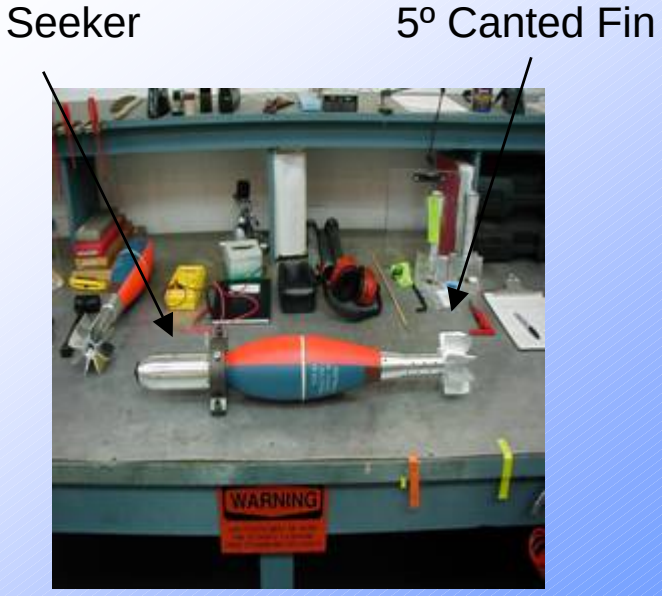
83 PGMMs reduced logistics burden of Indirect Fire Ammunition by 122 STONS (110.7 Metric Tons)!

Low Cost Course Correction
Concept and Goals

- **Concept: Microexplosive diverters correct projectile trajectory based on optical signals from laser illuminated target**
- **Goals: Less Rounds for Same Effects, Affordable Cost**



Seeker and Electronics

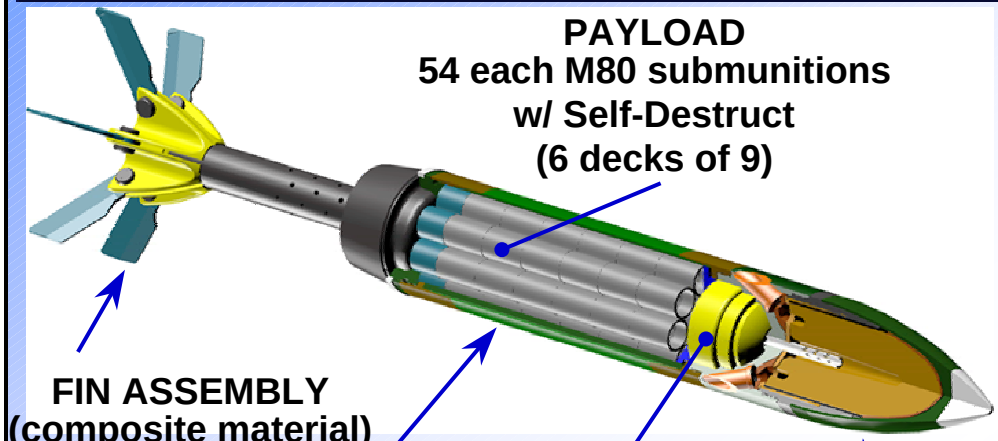


Test Round

Low Cost Course Correction Status

- Subsonic Wind Tunnel testing:
  - 2% decrease in stability due to nose unit, but can be compensated with a drag effect with new canted fin.
- Diverter characterization testing:
  - The preliminary results show 2 to 6 mils correction achievable.
- Hardware-in-the-Loop testing:
  - Strong agreement between the simulation model and seeker output.
- Tactical LC3 Horizontal Test firings 6-8 August 2002 with laser source / target:
  - All projectiles (6) successfully diverted towards the designated target.

Future Family 120mm Ammo
Description

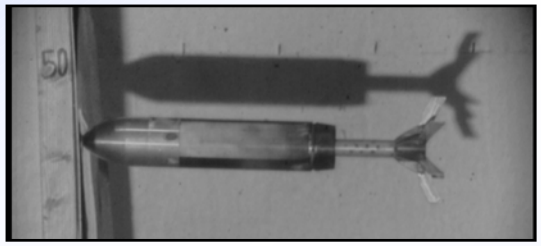


- 120mm cargo carrying round
- Rocket Assist for Extended Range
  - 12-15 km range
  - Multifunction Electronic Fuzing
- Generic Configuration
  - Accommodates a Wide Variety of Payloads, including:
    - Unitary
    - Smoke
    - Illumination
    - Full Range Practice
    - Non-Lethal

Future Family 120mm Ammo Status

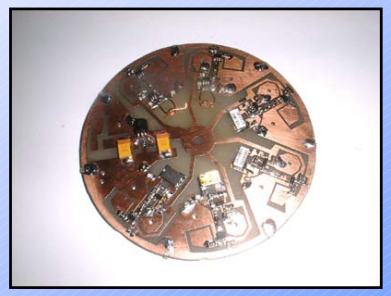
Advanced Technology Demonstration Accomplishments:

- **Successful range flight demo test confirming rocket motor and exterior ballistic performance to 8.7 km (23% greater than US fielded mortar).**
- **Critical composite airframe components of cargo body and rocket motor ogive survived high-G launch live fire.**
- **Rocket motor interior ballistic characterization data to achieve extended range.**
  - **Six-degree of freedom (6 DOF) modeling data predicts an 12 km range with time of flight of 60 sec.**
- **On-board Velocity Measurement Rocket Ignition (VMRI) sensors to measure muzzle velocity successfully tested in High-G environment (air gun).**



Live-Fire Structural Integrity Test

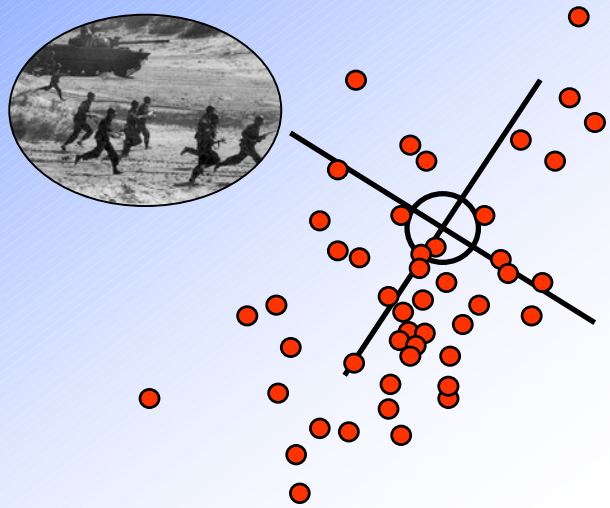
Rocket Propulsion in Flight



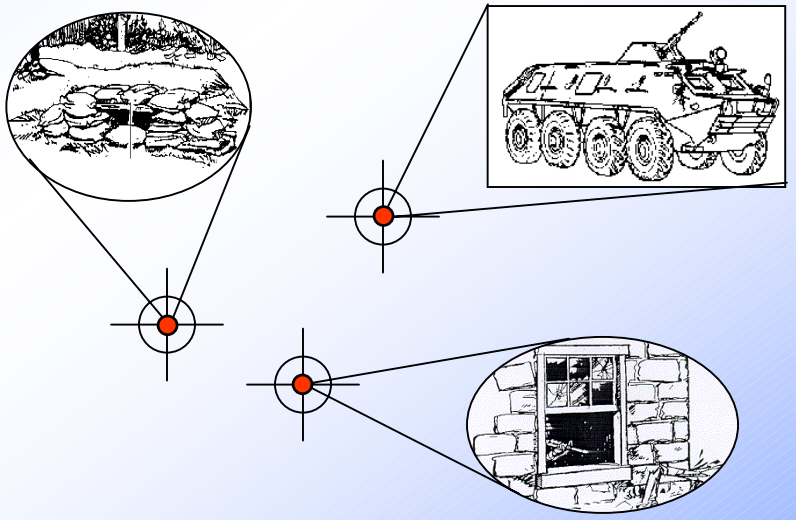
VMRI Crystal Test Fixture

Precision Guided Mortar Munition

Current



Future



High Explosive

- Area Effects
- High Volume Fire
- Defeat Targets in the Open
- Suppress Personnel Under Cover

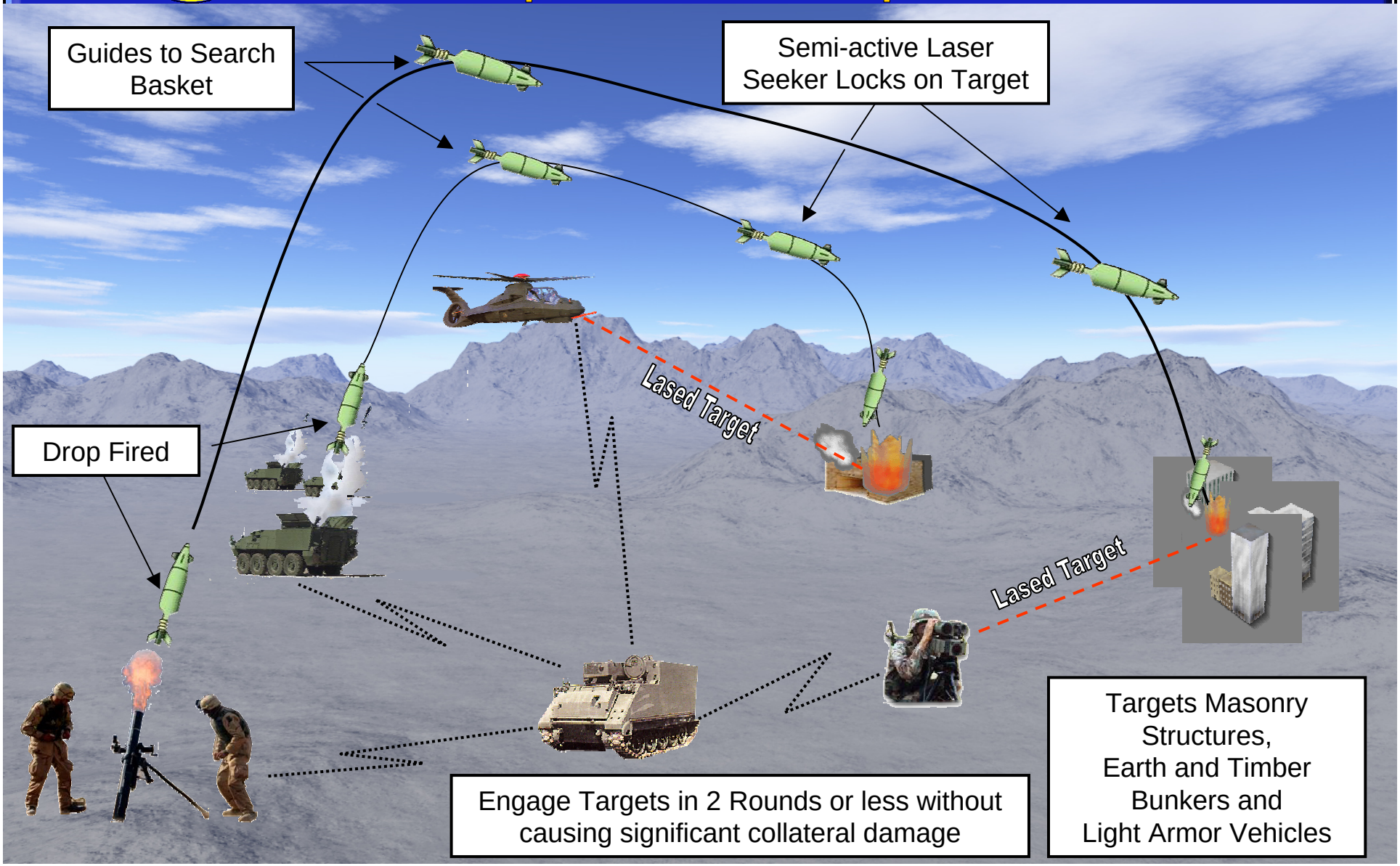
Precision Guided

- Precision Effects
- 1-2 Rounds to Effect Target
- Incapacitate Personnel Under Cover
- Low Collateral Damage

PGMM gives Battalion Commanders Organic Precision Strike Capability

Precision Guided Mortar Munition

Operational Concept



Incremental Development

PGMM

	2002	2010	2012	2014
	M934A1 High Explosive	XM395 PGMM Block 1	XM395A1 PGMM Block 2	XM395A2 PGMM Block 3
Accuracy	Area Fire	< 2 rounds	< 2 rounds	< 2 rounds
Range	7.2 km	7.2 km	10 km	12 km
Lethality	High	High	High	High +

Precision Guided Mortar Munition
Program Status

- Advanced Technology Demonstration (ATD) Program concluded October 2001
- Component Advanced Development (CAD) Program completed - Increased Maturity of the Fuze & Warhead
- Full and open competition for System Development & Demonstration (SD&D) contract underway
- Milestone B (SD&D start) scheduled 1QFY04, followed by contract award.

1995-2001

Advanced Technology Demonstration

2002-2003

CAD

B

Fuze
Warhead

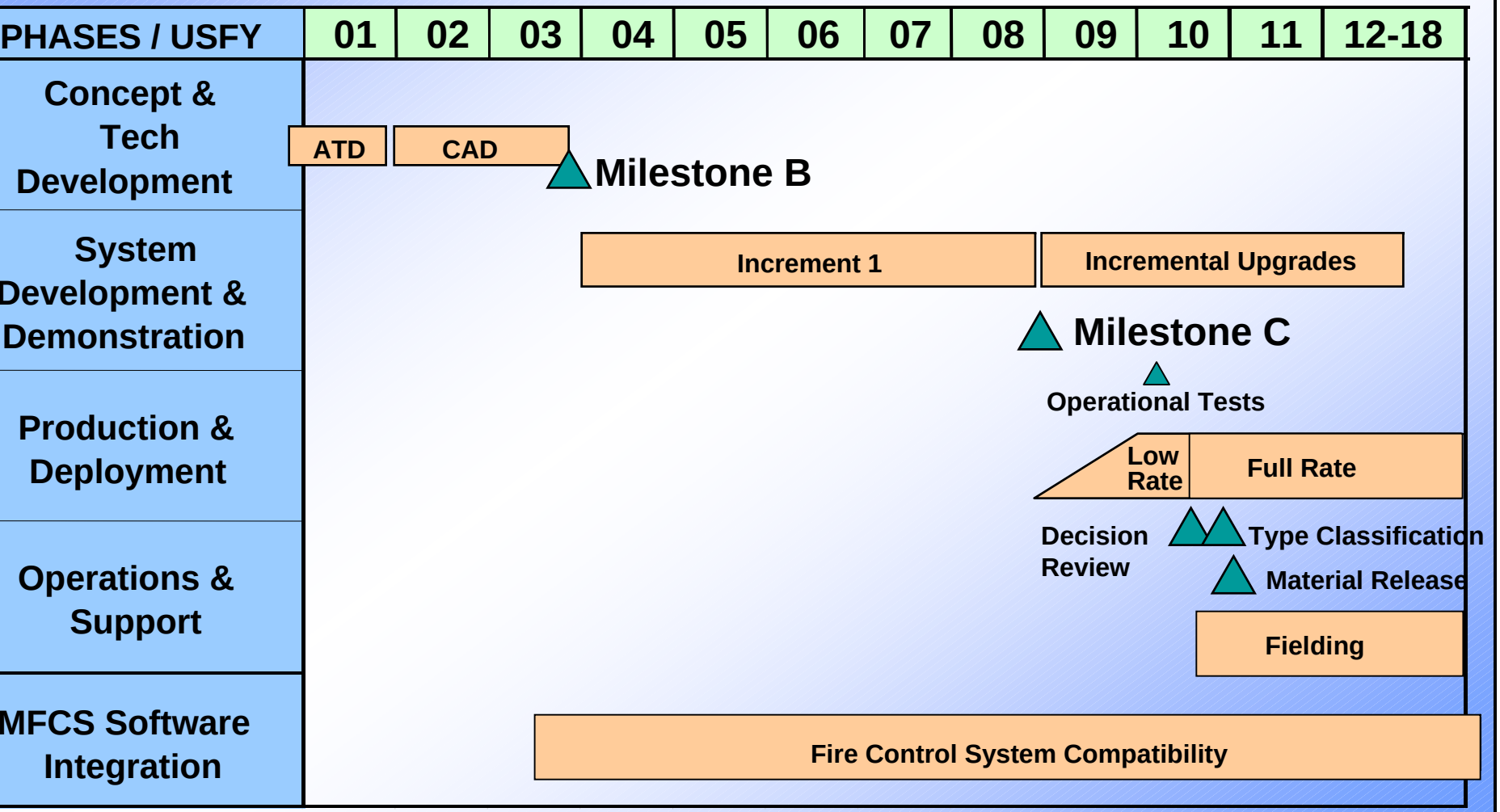
Transition
Documentation

2004-2010

SD&D / Low Rate Production

Subsystem / System Qualification
Performance / Reliability Verification
Lean Design / Producibility
User Testing / Fielding

Precision Guided Mortar Munition
Program Schedule



PGMM Delivered to the Field in US Fiscal Year 2010

Precision System Approach





Target Identified Call for Fire

Shot Out

Lase Target

End of Mission

Digital & Voice Fire Support Systems



Compute Ballistic Solution

Shot Over

Lase Tgt

FDC

Mortar Fire Control System (MFCS)

Prepare, Hang, Fire



Conclusion

- US Army investing in Improving the Performance of Mortars
  - Improved Fire Control
  - Distribution of 120mm System to Light Forces
  - Precision Munitions
- Result will be Precision Capabilities for the Maneuver Commander