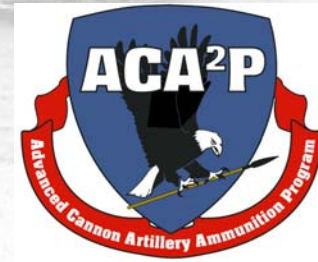


XM1131 105mm High Explosive Pre-Formed Fragmentation (PFF) Cartridge

Guns and Missiles Conference

April 23 - 26, 2007



Agenda

- Overview
- 105mm PFF
 - Background
 - Characteristics
 - Performance
 - Type Classification Plan
- Summary



Why 105mm and PFF?

- With current 105mm ammunition the warfighter is at a disadvantage by the lack of range and lethal performance
- The ACA²P 105mm PFF projectile has given the light warfighter expanded capabilities in lethality
- The lightweight mobility of 105mm weapons, coupled with 155mm level lethality, means that the light forces are not hindered by weight restrictions
- Having an entire suite of 105mm ammunition with the same ballistic solution, provides the warfighter with a complete tool kit to accomplish the mission successfully

ACA²P 105mm Family



- Visible Illumination
- IR Illumination
- Bi-spectral screening smoke
- RP Incendiary
- HE Practice
- VLAP - Velocity Enhanced Long-Range Artillery Projectile

105mm PFF Background

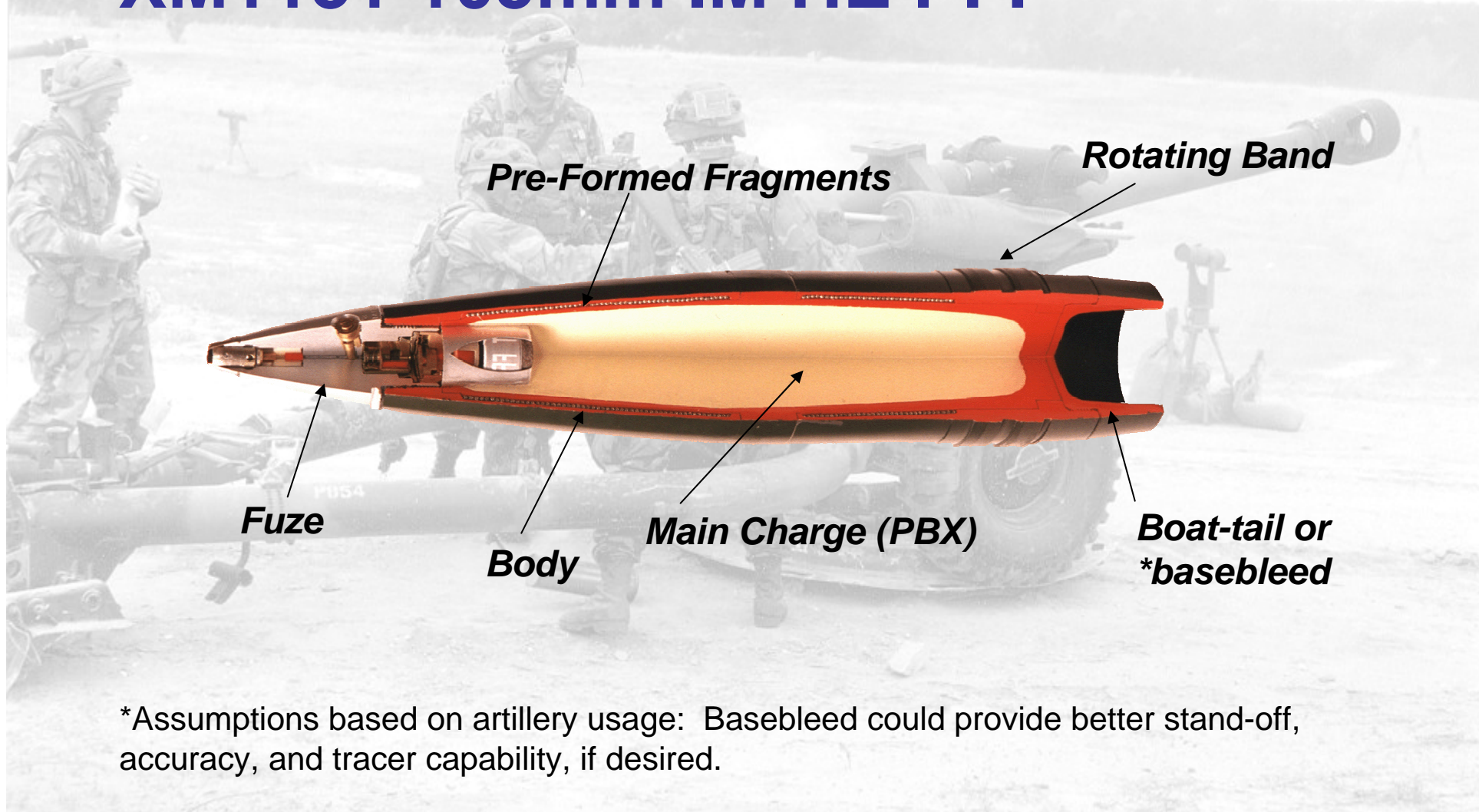


- In 2002, the Advanced Cannon Artillery Ammunition Program (ACA²P) was created to help modernize conventional artillery ammo
- Need for high effectiveness against soft targets without the use of DPICM's
- Several successful static tests conducted both at Picatinny Arsenal and at Ft. Sill confirmed the very high effectiveness
- Army's priority is 105mm Base Bleed IM HE-PFF



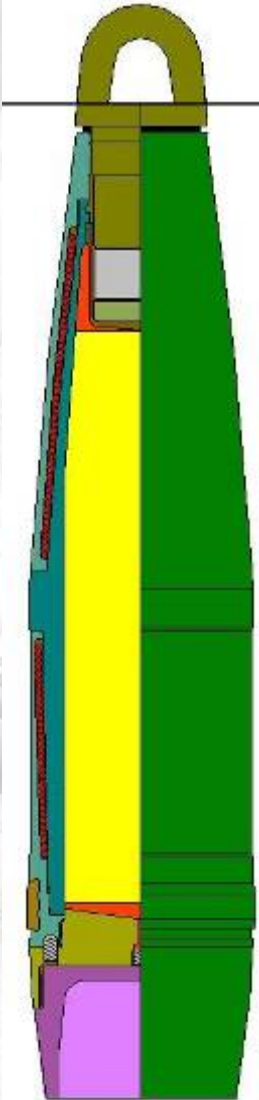
System Description

XM1131 105mm IM HE PFF



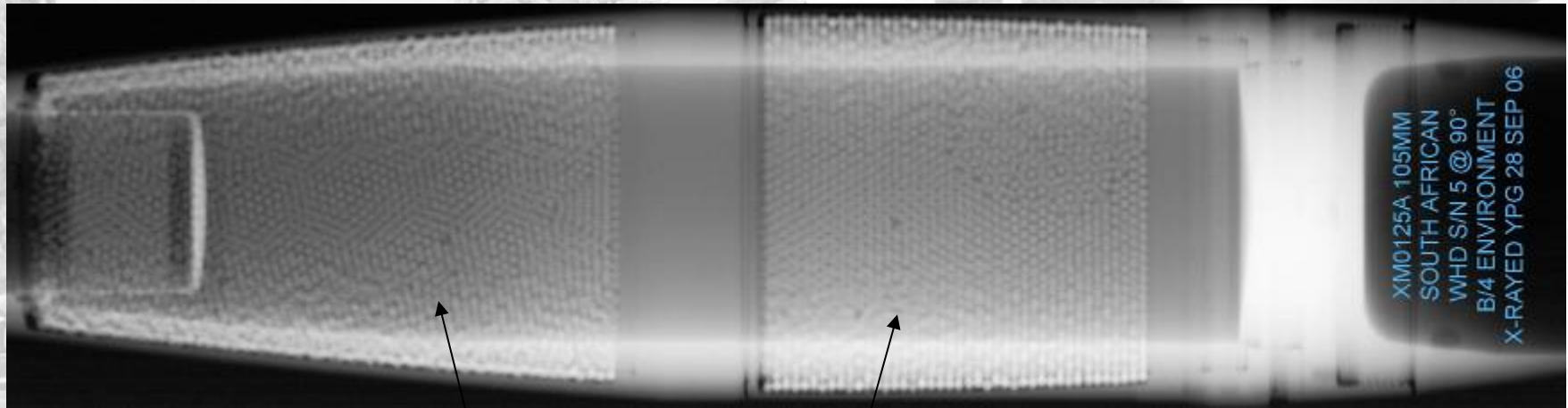
System Characteristics

XM1131 105mm IM HE PFF



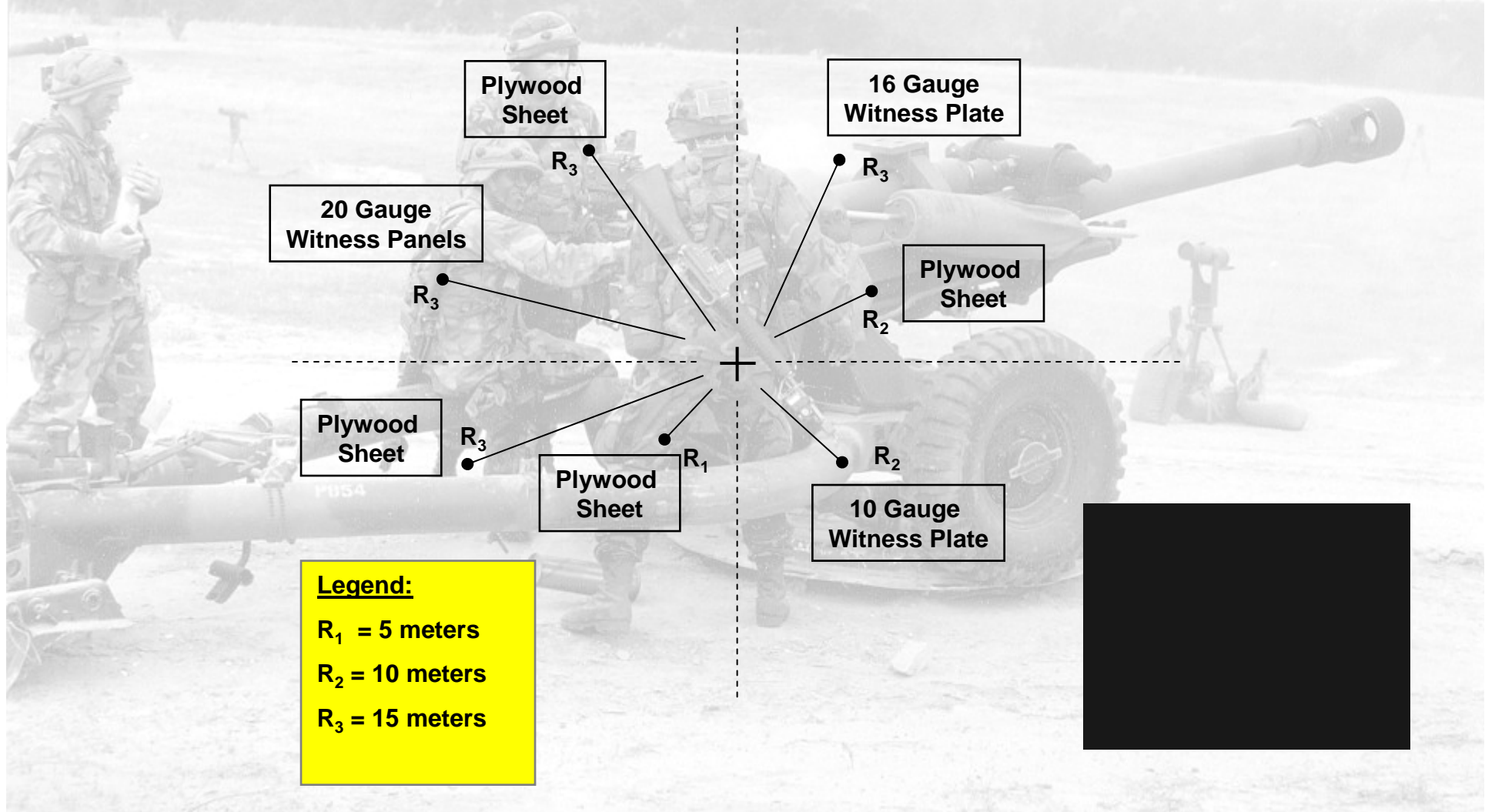
- Type – HE w/ Pre-Formed fragments
- Weight – 34.8lbs (16kg)
- Length – 21.6in (551mm) (fuzed)
- Projectile Body – High fragmentation steel with inner lining of > 9,000 ~3mm tungsten balls
- IM Explosive Fill – 4.1lbs (1.8 kg) of PBX blend (80% RDX)
- Max. Ranges – M119A2 105mm howitzer
M67 11.5km BT - 13.7 km Base Bleed
M200 13.9km BT - 18.1km Base Bleed

X-Ray View of the XM1131

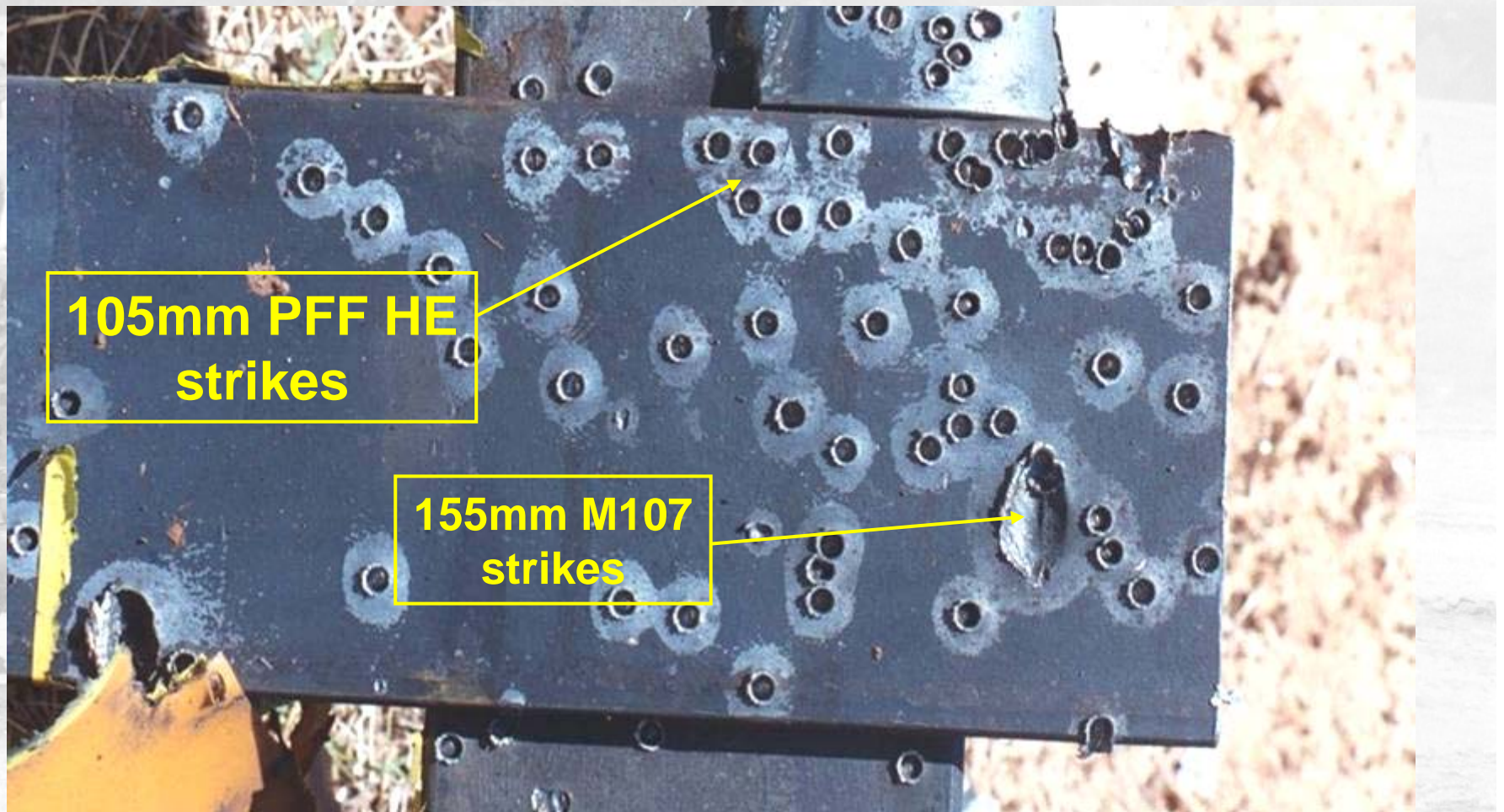


Tungsten matrices

PFF Test – Ft. Sill - 2005



Greater Lethality versus Personnel and Soft Skinned Targets



Increased Ground Operational Reach

105mm Range Comparison



M119A2

11.5 Km
M1 HE

14 Km
M760 HE

15 Km
XM1131

18.1 Km
XM1130

Current
Operational
Limits

ACA²P
Extended
Operational
Reach

105mm Lethality Comparison

- PFF has 2 - 4X improvement in lethality compared to current M1(HF) against select targets
- Improved first shot P_{kill}
- Reduction in collateral damage
- Growth to precision accuracy

Reduced Vulnerability

IM Accomplishments – 1st Qtr

- IM Tests conducted at Denel in March, unpackaged:

– Bullet Impact	Pass	Type IV*
– Fragment Impact	Pass	Type IV*
– Sympathetic Det	Pass	Type III (12mm HDPE)
– Fast Cook-Off	Pass	Type IV*
– Slow Cook-Off	Pass	Type IV*
– 12 Meter Drop	Pass	Type V

* Base ejection safe distance exceeded, no deflagration or burn

Type I Detonation	Type II Partial Detonation	Type III Explosion	Type IV Deflagration	Type V Burn
----------------------	-------------------------------	-----------------------	-------------------------	----------------

GENERAL DYNAMICS
Ordnance and Tactical Systems



ACA/P Leadership Review 6-2006



22

- U.S. Army moving ahead with pressed warhead
- Passed all but one IM test



IM Compliance



Bullet Impact

Fragment Impact



Sympathetic Detonation



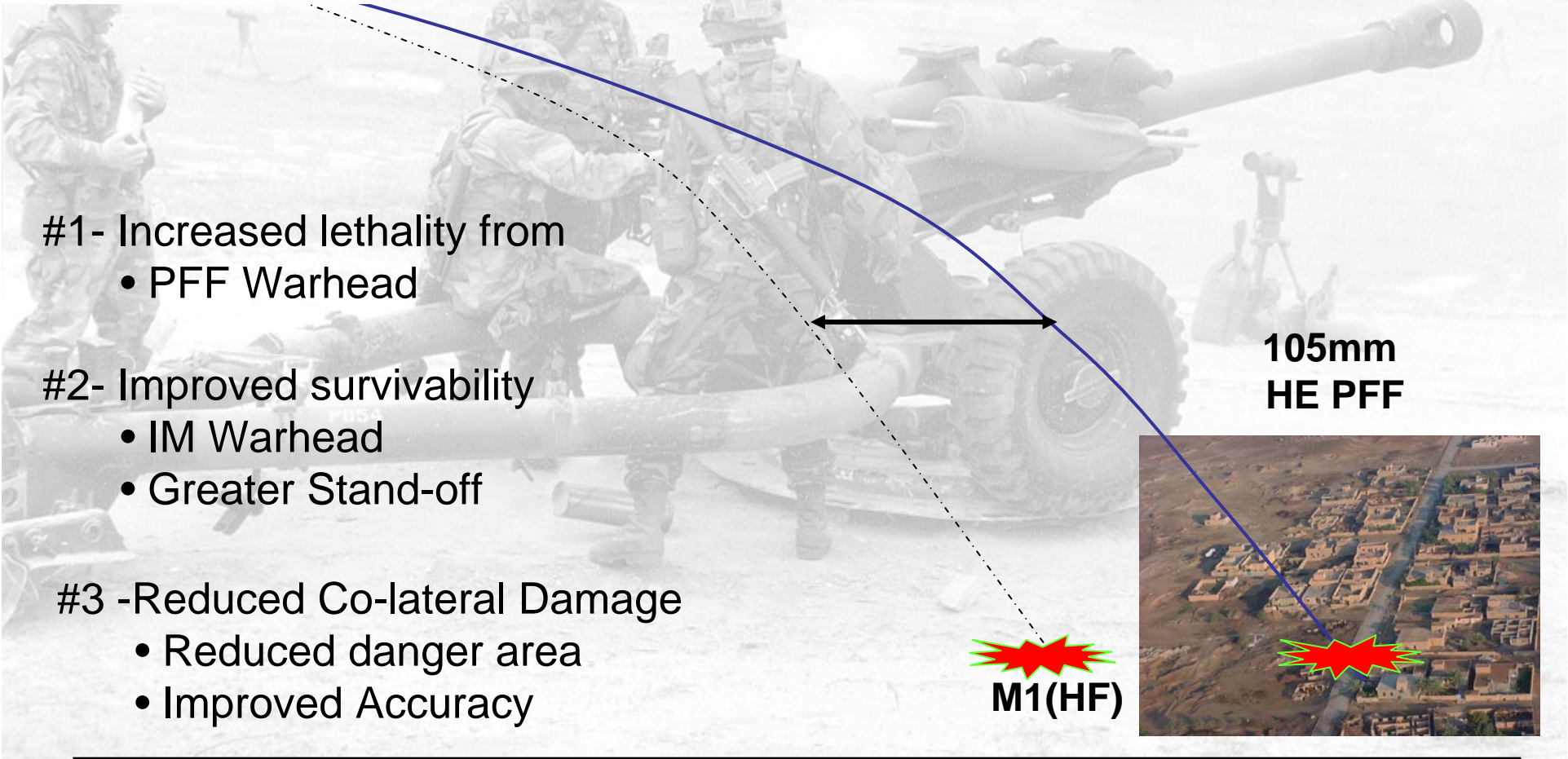
Fast Cook-off

XM1131 TC Path for Army

- IM Board Review Complete
- Packaging Confirmation Test Complete
- Explosives Task Order Complete
- TC Hardware Delivery Complete
- Explosives Qual Test Start Complete
- Qualification Tests Complete
- CPD Approval Apr 07
- TC Documentation Jun 07
- TC Standard Jul 07
- Initial Fielding Aug 08



AC-130 PFF Application



#1- Increased lethality from

- PFF Warhead

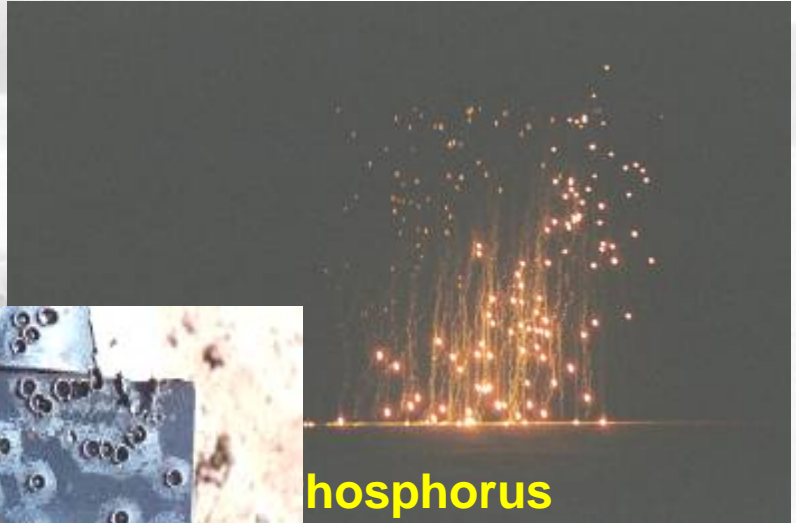
#2- Improved survivability

- IM Warhead
- Greater Stand-off

#3 -Reduced Co-lateral Damage

- Reduced danger area
- Improved Accuracy

ACA²P Technologies Demonstrated



Propelling Charge Path

- Army currently evaluating XM350 HYBRID propellant for 105mm Pff to replace both the M67 and M200 zoned ranges with single charge system
- Performance Improvements:
 - Enhanced Ballistic Efficiency
 - Uses a burn rate modifier
 - Improved geometry
 - Reduced barrel wear, erosion, and gun-flash
 - Superior IM performance improves aircraft survivability
 - Affordable replacement to M1
 - Potential to reduce gun recoil
 - Eliminates dependence on foreign nitro-guanidine

