

# Future Combat Systems (FCS) Durable Gun Barrels and Armaments Manufacturing Technologies

Three unique manufacturing processes to enhance lethality and extend service life of specific FCS solutions.

## OBJECTIVE / SOLUTION

The objective of this ATO-M is to develop robust, production capable, large caliber Future Combat Systems (FCS) cannon manufacturing processes for high strength steel and composite barrel overwraps. For medium caliber FCS cannons, the goal is to develop a manufacturing method to apply improved protective bore coatings to counter the effects of wear and erosion from advanced propellants used in higher performance ammunition. This ATO-M will develop and demonstrate high strength steel and composite overwrapping on the Future Combat Systems Mounted Combat System (FCS MCS) XM360 120mm gun barrel and Non-Line-of-Sight-Cannon (NLOS-C). The explosive cladding processing technology will be demonstrated on the 25mm M242 Bushmaster cannon and applied to FCS medium caliber Mk44 30/40mm barrels.



Future Combat Systems Non-Line-of-Sight Cannon (FCS NLOS-C)



FCS MCS Vehicle with XM 360 Cannon



Bradley M2A3 Infantry Fighting Vehicle

## BENEFITS

- Enables greater than M1 Abrams tank lethality on lightweight MCS platform.
- Enables high rate of fire at increased ranges for MCS and NLOS-C systems.
- Enables worldwide deployability of FCS platforms.
- Enables Infantry Combat Vehicles (ICV) to fire higher lethality ammo and extends barrel service life.

## STATUS

### High Strength Armament Steel

- Utilizing a Materials-by-Design concept to reduce melt iterations, 300lb. prototype heats have been evaluated and candidate M47-2C scale-down design selected. 190KSI M47-2C High Strength steel design scale-up to 35-45 ton full scale with two domestic suppliers for FCS MCS and NLOS-C cannons.
- Reduction in forged steel cost up to 50%.

### Composite Overwrap

- Production capable thermoplastic wind intension composite overwrap manufacturing prototype machine has been developed, demonstrated, and is operational.
- Thermoplastic materials at medium tension have been successfully demonstrated for the 120mm XM360 MCS gun on MTO #5 gun and EM gun launcher sections at high tension.

### Explosive Cladding

- Completed 12" step-tests for determining optimal donor-tube diameter for five refractory metal candidate materials (Ta-10W, Ta-5W, Ta-5W-2Mo, Ta-2.5W, and Stellite 25).
- Down-selected Ta-2.5W cladded on 36" barrels. Full length cladding on-going for 25mm barrels.

## WEAPON SYSTEMS / SECONDARY ITEMS IMPACTED

- Future Combat Systems Mounted Combat System (FCS MCS)
- Future Combat Systems Non-Line-of-Sight Cannon (FCS NLOS-C)
- Future Combat Systems Infantry Combat Vehicle (FCS ICV)
- Bradley M2A3 Infantry Fighting Vehicle-25mm M242 Bushmaster cannon

## POTENTIAL COST AVOIDANCE

- Reduction in forged steel cost from \$8.29/lb. to \$4.50/lb.
- Reduction in composite overwrap barrel cost from \$25,000 to \$10,000.