Affordable, High-Rate Composite Aircraft Manufacturing

2023-2024 PDAC Submission

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Need: Affordable Mass

The affordable mass concept: a fleet of *low-cost* air-, land-, and sea-based *drones that can be deployed by the thousands*

Affordable mass is an urgent DoD priority:

- Kathleen Hicks, Deputy Secretary of Defense:
 - "Help us overcome the PRC's biggest advantage, which is mass... Now is the time to take all-domain, attritable autonomy to the next level: to produce and deliver capabilities to warfighters at the volume and velocity required to deter aggression, or win if we're forced to fight."
- Frank Kendall, Secretary of the Air Force:
 - "The affordable mass concept and all our analytics show overwhelmingly that this provides us an overmatch capability and changes our loss-exchange ratios dramatically in our favor."



Solution: CRG's Agile Composite Structures

- High-rate manufacturing process to support critical DoD needs
- Low cost, high performance aerospace composite material
- Complex shapes and mating features in a single part enables enable rapid assembly
- Leverages existing US capital equipment infrastructure
- Developed and demonstrated on multiple DoD programs (AF, Navy)

Automotive production rates with Aerospace properties

	CRG's Agile Composite Structures	Prepreg Composite Structures	Al 6061 Structures
Strength	4 - 0-4-0	al−te al−te al−te	ı⊫ı ı⊨ı ı⊨ı
Weight			
Material Cost	\$	\$\$\$	\$\$
Fabrication Time	X	$\mathbf{X} \mathbf{X} \mathbf{X} \mathbf{X}$	$\mathbf{X} \mathbf{X} \mathbf{X}$
Assembly Time	X		$\Sigma \Sigma \Sigma$
Labor	ŕ	** *	^ † †

CRG Affordable, High-Rate Composites

Project Overview

- Demonstrate affordable, high-rate composite manufacturing method
- Generate as-built material properties to support design of attritable aircraft
- Establish supply chain partners for materials and distributed manufacturing

TACFI/STRATFI

• SBIR/STTR:Gov matching funds up to \$15M

Dual-Use Applications

- Advanced air mobility (AAM) composite structures
- Wind turbine components (conventional and airborne with IACMI)









What We Do

Applied Research & Development

CRG focuses on rapid innovation and delivering new capability to our customers

Core Competencies

Aerospace Systems

- Aircraft Design/Build/Fly
- Quiet Electric Propulsion
- Aircraft Repair and Sustainment
- Electromagnetics

Human Health & Al

- Casualty Care
- Wearable Sensors
- Environmental Sensors
- Autonomous Detection and Deterrence
- Edge Computing

Power & Energy

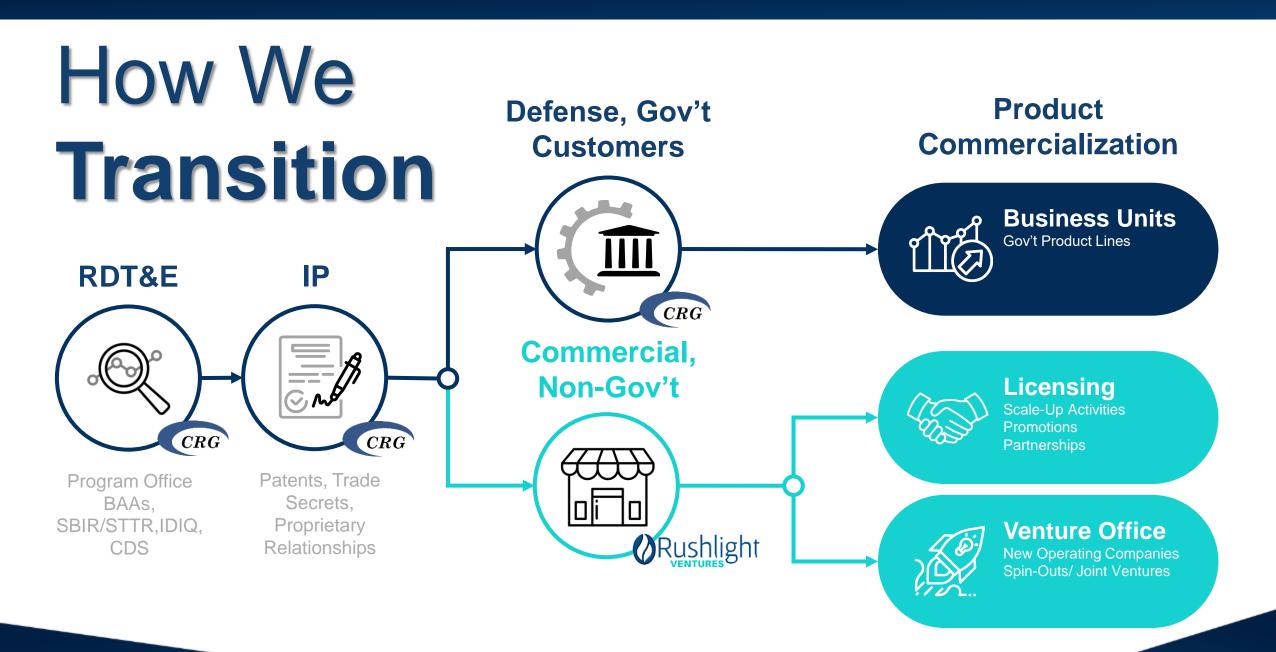
- Energy Storage
- Power Generation and Conversion
- Power Distribution and Management

Advanced Materials & Manufacturing

- Advanced Polymers
- Additive Manufacturing
- Affordable, Agile
 Composite Structures
- Manufacturing Process
 Development







CRC