Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army											Date: April 2022	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army* / BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0708045A / *End Item Industrial Preparedness Activities*							
COST ($ in Millions)	**Prior Years**	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
Total Program Element	-	130.785	103.720	91.270	-	91.270	74.986	66.673	66.695	67.344	0.000	601.473
E25: *Mfg Science & Tech*	-	58.785	61.720	91.270	-	91.270	74.986	66.673	66.695	67.344	0.000	487.473
EA2: *MANTECH INITIATIVES (CA)*	-	72.000	42.000	-	-	-	-	-	-	-	0.000	114.000

A. Mission Description and Budget Item Justification

This Program Element (PE) develops, demonstrates, and transitions manufacturing technologies and processes that enable improvements in producibility and affordability of emerging and enabling components and subsystems of Army ground and air platforms, Soldier systems, weapons systems, air & missile defense systems, as well as sensors and electronics. Initiatives within the PE result in cost savings and reduced risk of transitioning military-unique manufacturing processes into production. Project E25 fosters the transfer of new/improved manufacturing technologies to the industrial base, including manufacturing efforts that have potential for high payoff across the spectrum of Army systems.

The cited work is consistent with the Under Secretary of Defense, Research and Engineering science and technology focus areas and the Army Modernization Strategy.

Work in this PE is performed by the United States (U.S.) Army laboratories and research centers, U.S. Army Program Executive Offices and Program Management Offices, and U.S. Army depots and arsenals.

B. Program Change Summary ($ in Millions)	**FY 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**
Previous President's Budget	130.785	61.720	0.000	-	0.000
Current President's Budget	130.785	103.720	91.270	-	91.270
Total Adjustments	0.000	42.000	91.270	-	91.270
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	42.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	91.270	-	91.270

Congressional Add Details ($ in Millions, and Includes General Reductions)	**FY 2021**	**FY 2022**
Project: EA2: *MANTECH INITIATIVES (CA)*		

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Army	Date: April 2022
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0708045A *I End Item Industrial Preparedness Activities*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2021	FY 2022
Congressional Add: *Functional Fabrics and Smart Textiles- Continued*	10.000	-
Congressional Add: *Smart Manufacturing of Engineered Fabrics - Continued*	7.000	-
Congressional Add: *Scalability of Functional Fabric Manufacturing - Continued*	5.000	5.000
Congressional Add: *Nanoscale Materials Manufacturing- Continued*	10.000	5.000
Congressional Add: *Compact Efficient Rotary Engine*	10.000	-
Congressional Add: *Lightweight High Efficiency Generators*	10.000	-
Congressional Add: *Glass Separators for Lithium Bateries- Continued*	5.000	-
Congressional Add: *Advanced Manufacturing Cell for Missile Fins*	5.000	8.000
Congressional Add: *Advanced Manufacturing Technology*	5.000	-
Congressional Add: *Tungsten Manufacturing Affordability Initiative for Armaments - Continued*	5.000	-
Congressional Add: *Liquid Hydrogen Refueling Systems*	-	10.000
Congressional Add: *N2O5*	-	10.000
Congressional Add: *Lightweight Transparent Film Armor- Continued*	-	4.000
Congressional Add Subtotals for Project: EA2	72.000	42.000
Congressional Add Totals for all Projects	72.000	42.000

Change Summary Explanation

FY 2023 funding increase reflects the fact that the FY 2022 President's Budget request did not include out-year funding.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0708045A / *End Item Industrial Preparedness Activities*	Project (Number/Name) E25 / *Mfg Science & Tech*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
E25: *Mfg Science & Tech*	-	58.785	61.720	91.270	-	91.270	74.986	66.673	66.695	67.344	0.000	487.473
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Project develops and demonstrates manufacturing technologies and processes that enable improvements in producibility and affordability of emerging and enabling components and subsystems of Army ground and air platforms, Soldier systems, weapons systems, air & missile defense systems, and sensors and electronics. Work is performed to advance the state of the art in manufacturing processing and fabrication techniques for coatings, multifunctional materials, and structural elements for Army specific applications.

The cited work is consistent with the Under Secretary of Defense for Research and Engineering priority focus areas and the Army Modernization Strategy.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Title: Networks and Command, Control, Communications and Intelligence	12.440	10.542	12.410
Description: ManTech efforts focused on an integrated system of hardware, software and infrastructure that is sufficiently mobile, reliable, user-friendly, discreet in signature, expeditionary and appropriate for any environment where the electromagnetic spectrum is denied or degraded. It also focuses on dependable communication or assured position, navigation, and timing; tactical space; navigation warfare; and Cyber operations. Additionally, it covers virtual and immersive Common Operation Environments in support of faster decision making. These efforts support the Army modernization priority for future systems and enabling areas for assured positioning, navigation, timing and synthetic training environments. Efforts are aligned to programs within the executive offices of Intelligence Electronic Warfare & Sensors; and Command Control Communications-Tactical.			
FY 2022 Plans: Develop and advance manufacturing processes and capabilities supporting command and control systems/subsystems and position, navigation, and timing systems.			
FY 2023 Plans: Continue to develop and advance manufacturing processes and capabilities supporting command and control systems/ subsystems and position, navigation, and timing systems.			
FY 2022 to FY 2023 Increase/Decrease Statement: The increase in this effort will support the maturation of the manufacturing of the low cost chip scale atomic clock redesign supporting the mounted and dismounted assured positioning systems; the development of raw materials for optical improvements			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0708045A / *End Item Industrial Preparedness Activities*	**Project (Number/Name)** E25 / *Mfg Science & Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
in the 3rd gen forward looking infrared cameras; and support the transition of the digital pixel imagers for aviation to the apache pilot night vision system.			
Title: Long Range Precision Fires ***Description:*** The effort funds manufacturing improvements to support areas that enable hypersonics, cannons, and missiles. Efforts focus on reduction in cost and time for manufacturing. ***FY 2022 Plans:*** Develop and advance manufacturing processes and capabilities supporting long range precision fires resulting in the affordability and producibility of advanced energetics, warheads, propulsion, guidance and navigation technology. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Long Range Precision Fires will transition to the Weapon Systems effort to better reflect the level of effort and it's support to both current and future programs of record.	2.962	7.369	-
Title: Air & Missile Defense ***Description:*** This effort funds advance manufacturing processes and capabilities supporting air and missile defense efforts. Efforts include manufacturing improvements to missile systems, directed energy systems, propulsion, and radar technologies. ***FY 2022 Plans:*** Develop and advance manufacturing processes and capabilities supporting air and missile defense efforts. This effort focuses on affordability and producibility of directed energy systems, advanced missiles and seekers, guidance and control, advanced aerostructures/propulsion, and air defense radar technologies. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Air Missile Defense will transition to the Weapon Systems effort to better reflect the level of effort and it's support to both current and future programs of record.	8.000	12.409	-
Title: Weapon Systems ***Description:*** Manufacturing technology efforts focused on current and future comprehensive weapons system platforms which include munitions and formations that improve range, lethality, mobility, precision, target acquisition and force protection capabilities within multi-domain operations. Additionally, these efforts support the Army modernization priorities for long-range precision fires (LRPF) which is focused on strategic fires, precision strike missile capabilities, and extended range cannon artillery as well as air missile defense (AMD) systems to include directed energy systems and interceptors focused on providing maneuverability for short range air defense, and indirect fire protection capabilities. Efforts are aligned to programs within the executive office of Missile and Space; and the joint executive office Armaments & Ammunition.	-	-	26.930

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0708045A / *End Item Industrial Preparedness Activities*	**Project (Number/Name)** E25 / *Mfg Science & Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Formerly titled Long Range Precision Fires and Air & Missile Defense. This effort is not new, it has been retitled to better align to both current and future acquisition systems. ***FY 2023 Plans:*** Continue to develop and advance manufacturing processes for weapon systems to include long range precision fires resulting in the affordability and producibility of advanced energetics, warheads, propulsion, guidance and navigation technology. Additionally supports air and missile defense capabilities focused on the affordability and producibility of directed energy systems, advanced missiles and seekers, guidance and control, advanced aero structures / propulsion, air defense radar technologies, directed energy weapon systems, high energy laser weapons systems, short range air defense, and indirect fire protection capability. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase in funding will advance manufacturing processes and manufacturability of cannon tubes in support of the extended range cannon artillery, smooth bore cannons, and the affordability and producibility of directed energy systems.			
Title: Next Generation Combat Vehicle ***Description:*** This effort funds manufacturing technology advances needed for more affordable and reliable components and subsystems for tactical and combat vehicles and weapons systems. This effort focuses on addressing challenges in areas such as advanced armor, protection systems, lighter weight components, insensitive propellants, armament systems, precision munitions, engines, sensor systems, and vehicle power devices for current and future systems. ***FY 2022 Plans:*** Develop and advance manufacturing processes and capabilities supporting the ground vehicles that results in dependable technology with an emphasis on providing affordable and timely solutions. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Next Generation Combat Vehicle will transition to Ground Systems to better reflect the level of effort and it's support to both current and future programs of record.	19.953	5.629	-
Title: Ground Systems ***Description:*** ManTech efforts focused primarily focused on Army land maneuverability and ground system platforms. These efforts support the Army?s ability to gain positions of relative advantage, overmatch the enemy, protect Soldiers from harm, and impose a tempo of event and multiple simultaneous dilemmas on the enemy to overwhelm enemy effectiveness through ground mobility. Additionally, these efforts support the Army?s modernization priority for Next Generation Combat Vehicles which integrate other close combat capabilities in manned and unmanned teaming, leveraging semi-autonomous and autonomous platforms in conjunction with improved firepower, protection, mobility and power generation capabilities. The ground portfolio	-	-	9.800

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0708045A / *End Item Industrial Preparedness Activities*	**Project (Number/Name)** E25 / *Mfg Science & Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
also supports force projection and force protection technologies to enable the Army to realize close combat. Efforts are aligned to programs within the executive offices of Ground Combat Systems; Combat Support & Combat Service Support; and the joint program executive office, Armaments & Aviation. Formerly titled Next Generation Combat Vehicle. This effort is not new, it has been retitled to better align to both current and future acquisition systems. ***FY 2023 Plans:*** Continue to develop and advance manufacturing processes and capabilities supporting ground vehicles that result in dependable technology with an emphasis on providing affordable and timely solutions. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increase will support the power converter in support of the the extended range cannon artillery capabilities and the composite rubber track efforts.			
Title: Future Vertical Lift ***Description:*** This effort funds manufacturing technology advances supporting future vertical lift platforms to increase operational reach and capabilities with a concentration on affordability and producibility through manufacturing solutions. ***FY 2022 Plans:*** Develop and advance manufacturing processes and capabilities supporting future vertical lift platforms for future attack, reconnaissance and long range assault capabilities, and air launched effects. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Future vertical lift will transition to Aviation Systems to better reflect the level of effort and it's support to both current and future programs of record.	6.290	11.301	-
Title: Aviation Systems ***Description:*** ManTech efforts focused on Army manned and unmanned aviation platforms to improve maneuverability, range, speed, payload capacity, mission systems, survivability, reliability, and reduced logistical footprint. Additionally, these efforts support the Army Future Vertical Lift modernization priority through manufacturing technologies that provide next generation of vertical lift aircraft for the Army. Efforts are aligned to programs within the joint executive office of Armaments & Ammunition and program executive office for Aviation.	-	-	19.870

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0708045A / *End Item Industrial Preparedness Activities*	**Project (Number/Name)** E25 / *Mfg Science & Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Formerly titled Future Vertical Lift. This effort is not new, it has been retitled to better align to both current and future acquisition systems. ***FY 2023 Plans:*** Continue to develop and advance manufacturing processes and capabilities supporting future vertical lift platforms for future attack, reconnaissance and long range assault capabilities, and air launched effects. Efforts align to the air platform systems. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increased efforts associated with air system platforms in support of maturing high impact advanced manufacturing capabilities. Specific components funded will include advanced manufacturing processes supporting rotor blades, advanced manufacturing efforts supporting multi-laser stitching production requirements, and the extended battery performance through weight reduction efforts.			
Title: Soldier Lethality ***Description:*** This effort funds manufacturing technology and processes in support of individual Soldier weapons, provide Soldiers with enhanced capabilities, and increase their ability to respond to emerging situations through advanced manufacturing processes with a concentration affordability and producibility. Work focuses on addressing challenges in areas such as multifunctional fabrics for shelters, uniforms and portage equipment; lightweight materials for body armor; and medical technologies such as biotechnology. ***FY 2022 Plans:*** Increase the capability of individual Soldier weapons, provide Soldiers with enhanced capabilities, and increase their protection and ability to respond to emerging situations through advanced manufacturing technology and processes. Efforts will result in greater affordability and producibility with a concentration on next generation squad weapons and ammunition, Soldier borne power, enhanced protective materials and systems, and sensor development. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Soldier Lethality will transition to Soldier Systems to better reflect the level of effort and it's support to both current and future programs of record.	9.140	12.216	-
Title: Soldier Systems ***Description:*** ManTech efforts focused primarily on integrated Soldier and Squad weapon platforms. These efforts provide manufacturing solutions that enhance integrated Soldier capabilities through their equipment, personal sustainment, performance, protection, and communication. Additionally, this effort supports the Soldier Lethality modernization priority. Efforts are aligned to programs within the executive offices of Soldier; Combat Support & Combat Service Support; Chemical Biological Radiological and Nuclear Defense; and the joint program office for armaments and ammunition.	-	-	22.260

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0708045A / *End Item Industrial Preparedness Activities*	**Project (Number/Name)** E25 / *Mfg Science & Tech*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Formerly titled Soldier Lethality. This effort is not new, it has been retitled to better align to both current and future acquisition systems. ***FY 2023 Plans:*** Increase the capability of individual Soldier weapons, provide Soldiers with enhanced capabilities, and increase their protection and ability to respond to emerging situations through advanced manufacturing technology and processes. Efforts will result in greater affordability and producibility with a concentration on next generation squad weapons and ammunition, Soldier borne power, enhanced protective materials and systems, and sensor development. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Increased efforts in support of high emerging requirements supporting ammunition, tactical power for warfighter systems, food rations, and vision protection requirements.			
Title: Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) ***FY 2022 Plans:*** Funding transferred in accordance with Title 15 USC ?638. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding transferred in accordance with Title 15 USC ?638.	-	2.254	-
Accomplishments/Planned Programs Subtotals	58.785	61.720	91.270

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Not applicable for this item.

D. Acquisition Strategy

Not applicable for this item.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0708045A / *End Item Industrial Preparedness Activities*	Project (Number/Name) E25 / *Mfg Science & Tech*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FY 2018 NDAA SEC 825 MDAP Cost Overrun	Allot	N/A : N/A	0.037	-		-		-		-		-	0.000	0.037	-
		Subtotal	0.037	-		-		-		-		-	0.000	0.037	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Mfg Science & Tech	Various	TBD : TBD	506.387	58.785		61.720		91.270		-		91.270	0.000	718.162	-
		Subtotal	506.387	58.785		61.720		91.270		-		91.270	0.000	718.162	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	506.424	58.785		61.720		91.270		-		91.270	0.000	718.199	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0708045A / *End Item Industrial Preparedness Activities*	**Project (Number/Name)** E25 / *Mfg Science & Tech*

	FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
N/A									[redacted]																			

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
N/A																												

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0708045A / *End Item Industrial Preparedness Activities*	**Project (Number/Name)** E25 / *Mfg Science & Tech*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
N/A	1	2016	4	2019

Note

N/A

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0708045A / *End Item Industrial Preparedness Activities*	Project (Number/Name) EA2 / *MANTECH INITIATIVES (CA)*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
EA2: *MANTECH INITIATIVES (CA)*	-	72.000	42.000	-	-	-	-	-	-	-	0.000	114.000
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Congressional Interest Item funding provided for ManTech Initiatives.

A. Mission Description and Budget Item Justification

Congressional Interest Item funding provided for ManTech Initiatives.
This effort accelerates manufacturing technology for more affordable electronic warfare, communications and sensors systems components and subsystems to include radio frequency amplifiers, antennas, and focal plane arrays. This effort accelerates and supplements manufacturing technology for more affordable components and subsystems for tactical and combat vehicles and weapon systems. Work focuses benefit from working to develop and scale up the manufacturing process for nano-tungsten carbide powders and high-volume single-crystal tungsten rod manufacturing processes. This effort accelerates and supplements manufacturing technology for more advanced manufacturing and enterprise solutions. Work focuses on accelerating model based manufacturing to specific organic Army facilities and novel ways of applying additive manufacturing and monitoring material powder beds and process controls during additive manufacturing part build for weapon system components.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022
Congressional Add: Functional Fabrics and Smart Textiles- Continued ***FY 2021 Accomplishments:*** Prototype demonstrations and Soldier testing to advance fabric-based sensor manufacturing processes.	10.000	-
Congressional Add: Smart Manufacturing of Engineered Fabrics - Continued ***FY 2021 Accomplishments:*** Continued the process of integrating engineered fabrics into wearable soldier applications.	7.000	-
Congressional Add: Scalability of Functional Fabric Manufacturing - Continued ***FY 2021 Accomplishments:*** Integrated fiber and fabric capabilities for fabric-based electronic devices and systems. ***FY 2022 Plans:*** Continue to do assessments for product integration and scaling as appropriate for with commercial manufacturing partners. Specific efforts in FY22 will include system development for commercial	5.000	5.000

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0708045A / *End Item Industrial Preparedness Activities*	**Project (Number/Name)** EA2 / *MANTECH INITIATIVES (CA)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022
prototype build to a maturity readiness level of 6; system validation and testing; in-house operational experiments and prototype testing.		
Congressional Add: Nanoscale Materials Manufacturing- Continued ***FY 2021 Accomplishments:*** Matured processes for silver Ink provider to support flexible electronic printing. ***FY 2022 Plans:*** Continue to scale up Nanoscale materials for manufacturing improvements and industrial based preparedness for critical component materials and armaments systems. Specific efforts will include the application of Tungsten Carbide for small to medium caliber penetrators to improve performance; optimization of Boron Carbide for application on ballistic protection and lightweight body borne plates; and advancement of critical materials (e.g. tantalum, niobium, etc.) for future applications (e.g. additive, hypervelocity, etc). Beneficiaries of this technology will be PEO Soldier and JPEO Armaments and Ammunition, and applied to maneuver ammunition systems, soldier lethality.	10.000	5.000
Congressional Add: Compact Efficient Rotary Engine ***FY 2021 Accomplishments:*** Advanced engine core design, fabrication and dyno testing for heavy-fuel rotary engine technology for next generation unmanned aircraft systems.	10.000	-
Congressional Add: Lightweight High Efficiency Generators ***FY 2021 Accomplishments:*** Matured manufacturing process of High Efficiency Hybrid thermodynamic Cycle (HEHC) engine to power a 1-3 kW electric generator.	10.000	-
Congressional Add: Glass Separators for Lithium Bateries- Continued ***FY 2021 Accomplishments:*** Advanced the manufacturing technology and processes for battery materials to be integrated into these SL and Future Vertical Lift CFT systems.	5.000	-
Congressional Add: Advanced Manufacturing Cell for Missile Fins ***FY 2021 Accomplishments:*** Developed a manufacturing production process for cell for missile fins to improve performance, quality and throughput. ***FY 2022 Plans:*** Develop manufacturing process for missile fin casting. FY22 efforts will specifically work on improving shell mold throughput; enhance melting and mold preheat; enhance core removal; and automate defect location and removal. Beneficiaries of this technology will be PEO Missile and Space, PM Strategic and Operational Rockets and Missiles. This technology will integrate into the Army Tactical Missile System and Precision Strike Missile.	5.000	8.000
Congressional Add: Advanced Manufacturing Technology	5.000	-

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0708045A / *End Item Industrial Preparedness Activities*	**Project (Number/Name)** EA2 / *MANTECH INITIATIVES (CA)*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022
FY 2021 Accomplishments: Matured advanced manufacturing processes for aluminum rolling mills, to include real time measurements of mill products and automated operations for improved cold mill processes, producibility and throughput for armor products. Assessed multiple materials for wear with low viscosity fuel and completed microstructure assessment .		
Congressional Add: Tungsten Manufacturing Affordability Initiative for Armaments - Continued ***FY 2021 Accomplishments:*** Provided new manufacturing source for to produce rocket nozzles and long rod penetrators that demonstrated reduced cracking and erosion.	5.000	-
Congressional Add: Liquid Hydrogen Refueling Systems ***FY 2022 Plans:*** Develop Manufacturing processes for multiple Portable Liquid Hydrogen Refueling Ground Support Equipment (GSE) Systems for the Army?s PM Counter Unmanned Aerial Systems (UAS). As the technology advances, hydrogen fuel cells will provide energy for a range of stationery and mobile applications. These efforts will specifically develop and demonstrate autonomous liquid hydrogen refueling by; proving that manufacturing, producing, storing and using hydrogen fueling systems will play an important role in driving further development of renewable energy, by balancing their intermittent supply modalities with the challenging end-user demands.	-	10.000
Congressional Add: N2O5 ***FY 2022 Plans:*** Develop manufacturing process to use dinitrogen pentoxide (N2O5) in the manufacture of explosives reducing manufacturing costs and reducing chromium-contaminated ammonium nitrate solution (ANSOL) waste byproducts that must be treated as hazardous waste and has a high remediation cost in their disposal.	-	10.000
Congressional Add: Lightweight Transparent Film Armor- Continued ***FY 2022 Plans:*** Continue optimization trials for integrated manufacturing process and begin flat UOPP film and laminate evaluations. This effort is developing a domestic source supporting manufacturing technology critical to the US Army.	-	4.000
Congressional Adds Subtotals	72.000	42.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Exhibit R-2A, RDT&E Project Justification: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0708045A / *End Item Industrial Preparedness Activities*	**Project (Number/Name)** EA2 / *MANTECH INITIATIVES (CA)*

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Army			Date: April 2022
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0708045A / *End Item Industrial Preparedness Activities*	Project (Number/Name) EA2 / *MANTECH INITIATIVES (CA)*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
FY 2018 NDAA SEC 825 MDAP Cost Overrun	TBD	N/A : N/A	0.039	-		-		-		-		-	0.000	0.039	-
		Subtotal	0.039	-		-		-		-		-	0.000	0.039	N/A

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Mfg Science & Tech	TBD	TBD : TBD	126.561	72.000		42.000		-		-		-	0.000	240.561	-
		Subtotal	126.561	72.000		42.000		-		-		-	0.000	240.561	N/A

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	126.600	72.000		42.000		-		-		-	0.000	240.600	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0708045A / *End Item Industrial Preparedness Activities*	**Project (Number/Name)** EA2 / *MANTECH INITIATIVES (CA)*

	FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
N/A																												

	FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
N/A																												

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Army		Date: April 2022
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0708045A / *End Item Industrial Preparedness Activities*	**Project (Number/Name)** EA2 / *MANTECH INITIATIVES (CA)*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
N/A	1	2016	4	2016