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Exhibit R-2, RDT&E Budget Item Justification: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604030N / <i>Rapid Prototyping, Experimentation & Dem</i>
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COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
Total Program Element	3.895	31.000	12.046	0.000	-	0.000	-	-	-	-	-	-
1036: <i>TETRA</i>	2.095	9.900	2.489	0.000	-	0.000	-	-	-	-	-	-
1037: <i>MK 38 MOD 4</i>	1.800	21.100	9.557	0.000	-	0.000	-	-	-	-	-	-

A. Mission Description and Budget Item Justification

The Rapid Prototyping, Experimentation, and Demonstration (RPED) Program accelerates and increases our Naval technology advantage. It's aligned to capability gaps and naval warfighting priorities. RPED leverages resources to provide rapid development of technologies into products that deliver urgently needed capability solutions. The FY2021 budget request reflects reduction as the DON pursues alternative funding strategies to support rapid development efforts. In accordance with the 2018 National Defense Strategy (NDS) and leveraging National Defense Authorization Act authorities for Middle Tier Acquisition and Acquisition Agility to support a more agile, lethal, and resilient force by rapidly developing and fielding needed warfighting capabilities. Projects funded in this program are aligned with the tenants of the Chief of Naval Operations Design for Maritime Superiority Version 2.0 to rapidly acquire key platforms and payloads to achieve high velocity outcomes. Concepts and enabling technologies include; directed energy weapons, hypersonics, autonomous and unmanned systems, artificial intelligence, machine learning, and multi-domain operations.

TETRA is a remotely operated vehicle (ROV) with the capacity for multiple mission payloads as key enabler to Subsea and Seabed Warfare (SSW) as identified in the SSW Initial Capabilities Document (ICD) signed March 2019.

The MK 38 MOD 4 30mm gun weapon system (GWS) will provide surface ship defense capability addressing unmanned aerial systems (UAS) and high speed maneuverable unmanned surface vehicle (USV) threats. This is a Maritime Accelerated Acquisition (MAA), which will install an Initial Capability (IC) in FY22 on DDG-51 ship class with AEGIS CP-22-1 combat system.

Oversight and accountability of projects funded by this program is provided by the DON Accelerated Acquisition Board of Directors (AABoD). Specific projects under this program will be selected and executed in accordance with the DON Accelerated Acquisition Process as described in SECNAVINST 5000.42.

Advanced Component Development and Prototypes (ACD&P) efforts necessary to evaluate integrated technologies, representative modes or prototype systems in a high fidelity and realistic operating environment are funded in this PE. Most of the work in this PE can be classified between Technology Readiness Level (TRL) 6 (system/subsystem model or prototype demonstration in a relevant environment) and TRL 7 (system prototype demonstration in an operational environment).

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B. Program Change Summary (\$ in Millions)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Previous President's Budget	31.000	12.100	0.000	-	0.000
Current President's Budget	31.000	12.046	0.000	-	0.000
Total Adjustments	0.000	-0.054	0.000	-	0.000
• Congressional General Reductions	-	-0.054			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604030N / <i>Rapid Prototyping, Experimentation & Dem</i>	Project (Number/Name) 1036 / TETRA
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COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
1036: TETRA	2.095	9.900	2.489	0.000	-	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Note

Funds were transferred from the Rapid Prototype Development Project 0385 (PE0604030N) to newly established TETRA Project 1036. TETRA was submitted to the Accelerated Acquisition Board of Directors (AABoD) and approved as a Maritime Accelerated Acquisition (MAA) program. In FY22, TETRA transitions from a N94 Rapid Prototyping Experimentation and Demonstration (RPED) effort to a program of record (PoR) with OPN LI 1611 and OMN/14D4D funds.

A. Mission Description and Budget Item Justification

TETRA is a remotely operated vehicle (ROV) with the capacity for multiple mission payloads as key enabler to Subsea and Seabed Warfare (SSW) as identified in the SSW Initial Capabilities Document (ICD) signed March 2019. TETRA is planned to be a future optional payload for SSNs and SSGNs by expanding current capabilities not offered by either submarines or unmanned undersea vehicles (UUV) through real time situational awareness and SSW effects. This is a Maritime Accelerated Acquisition (MAA), which started in FY19, and will field an Initial Capability (IC) in FY22.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: TETRA	9.900	2.489	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2021 Plans:					
<ul style="list-style-type: none"> - Continue overall vehicle endurance upgrade - Complete thruster upgrade - Complete modular payload bay development - Complete Autonomous Recovery and Docking - Complete system certification testing of upgrades - Complete fabrication of initial unit - Procure payloads and begin integration & testing - Continue VCS TEMPALT package - Release Request for Proposal (RFP) to Industry - Begin Integration into Submarine Warfare Federated Tactical Systems (SWFTS) Payload Control System (PCS) 					
FY 2022 Base Plans:					

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604030N / <i>Rapid Prototyping, Experimentation & Dem</i>	Project (Number/Name) 1036 / TETRA

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
N/A					
FY 2022 OCO Plans: N/A					
FY 2021 to FY 2022 Increase/Decrease Statement: FY 2021 to FY 2022 decrease due to TETRA R&D efforts ending in FY21					
Accomplishments/Planned Programs Subtotals	9.900	2.489	0.000	0.000	0.000

C. Other Program Funding Summary (\$ in Millions)

<u>Line Item</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2022 Base</u>	<u>FY 2022 OCO</u>	<u>FY 2022 Total</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>FY 2026</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• OPN/1611: <i>Small & Medium UUV</i>	0.000	0.000	3.500	-	3.500	-	-	-	-	-	-
• OMN/1D4D: <i>Weapons Maintenance</i>	0.000	0.000	1.449	-	1.449	-	-	-	-	-	-

Remarks

OPN/1611 and OMN/1D4D numbers shown are only for TETRA efforts

D. Acquisition Strategy

Hardware and software development integration supporting product improvement addressing new mission area.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604030N / <i>Rapid Prototyping, Experimentation & Dem</i>	Project (Number/Name) 1036 / TETRA
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Product Development (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Product Development	FFRDC	ARL/UT : Austin, TX	2.095	2.000	Mar 2020	0.639	Nov 2020	0.000		-		0.000	-	-	-
Product Development	WR	NUWC NPT : Newport, RI	0.000	6.651	Feb 2020	0.220	Oct 2020	0.000		-		0.000	-	-	-
Product Development	WR	Portsmouth : Portsmouth, NH	0.000	0.619	Feb 2020	0.155	Oct 2020	0.000		-		0.000	-	-	-
Product Development	WR	NSWC CD : Carderock, MD	0.000	0.000	Jul 2020	0.155	Oct 2020	0.000		-		0.000	-	-	-
Product Development	C/CPAF	HII : Newport News	0.000	0.000		1.320	Oct 2020	0.000		-		0.000	-	-	-
Product Development	FFRDC	PSU : State College, PA	0.000	0.400	Jan 2021	0.000		0.000		-		0.000	-	-	-
Product Development	WR	PSNS : Bremerton, WA	0.000	0.160	Feb 2021	0.000		0.000		-		0.000	-	-	-
Subtotal			2.095	9.830		2.489		0.000		-		0.000	-	-	N/A

Test and Evaluation (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Testing	WR	COMOPTEVFOR : Norfolk, VA	0.000	0.070	Feb 2020	0.000		0.000		-		0.000	-	-	-
Subtotal			0.000	0.070		0.000		0.000		-		0.000	-	-	N/A

Project Cost Totals	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	Cost To Complete	Total Cost	Target Value of Contract
	2.095	9.900	2.489	0.000	-	0.000	-	-	N/A

Remarks

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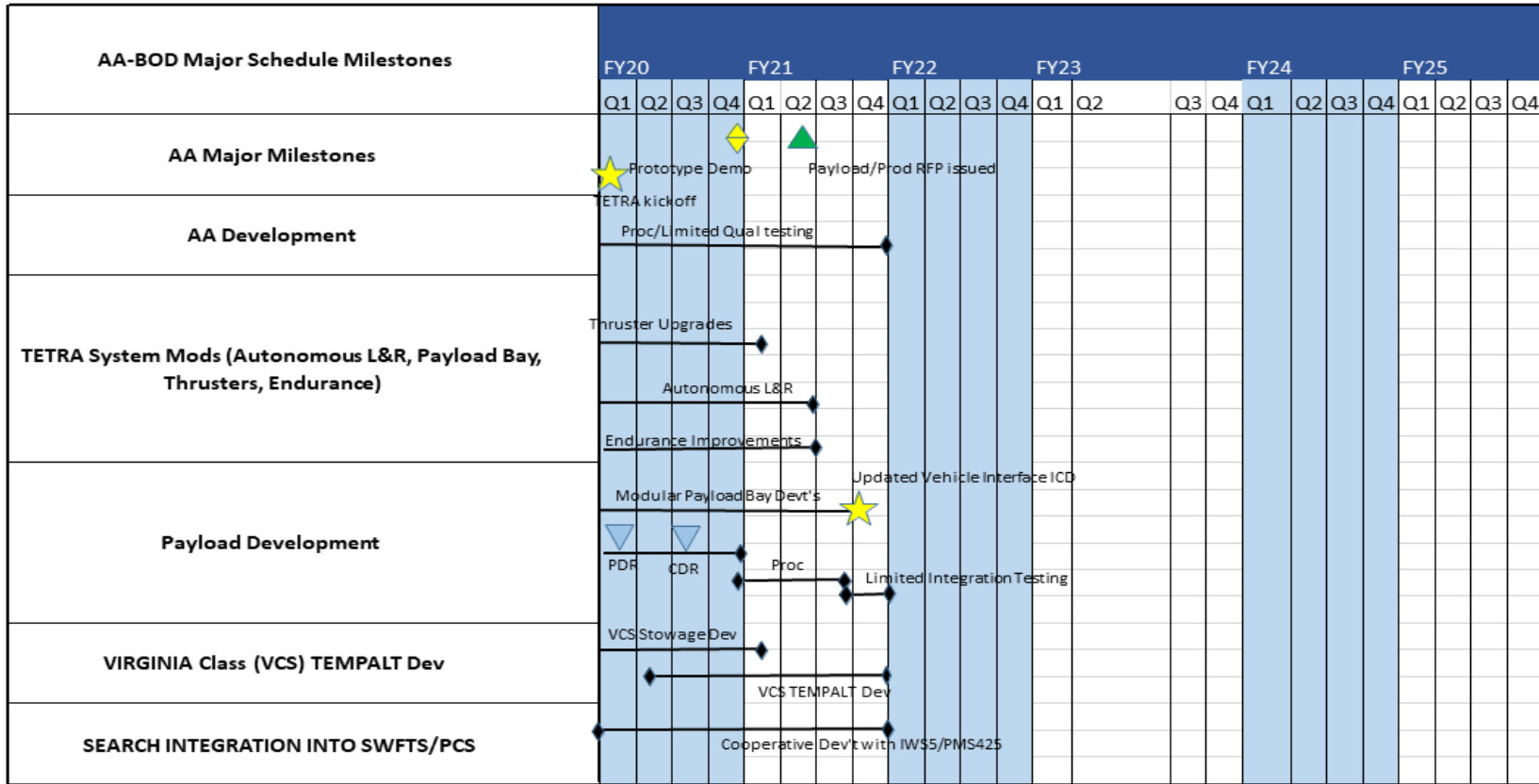
Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy

Date: May 2021

Appropriation/Budget Activity
1319 / 4

R-1 Program Element (Number/Name)
PE 0604030N / Rapid Prototyping, Experimentation & Dem

Project (Number/Name)
1036 / TETRA



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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604030N / <i>Rapid Prototyping, Experimentation & Dem</i>	Project (Number/Name) 1036 / TETRA

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 1036				
AA Major Milestones: TETRA Kickoff	1	2020	1	2020
AA Major Milestones: Prototype Demo	4	2020	4	2020
AA Major Milestones: Payload RFP Issued	2	2021	2	2021
AA Development: Begin Proc/Limited Qualification Testing	1	2020	4	2021
Tetra System Mods: Thruster Upgrades	1	2020	1	2021
Tetra System Mods: Autonomous L&R	1	2020	2	2021
Tetra System Mods: Endurance Improvements	1	2020	2	2021
Payload Development: Modular Payload Bay Development	1	2020	3	2021
Payload Development: Updated Vehicle Interface Control Document	3	2021	3	2021
Payload Development: PDR	1	2020	1	2020
Payload Development: CDR	3	2020	3	2020
Payload Development: Procurement	4	2020	3	2021
Payload Development: Limited Integration Testing	3	2021	4	2021
Virginia CL (VCS) TEMPALT Development: New VCS Stowage Development	1	2020	1	2021
Virginia CL (VCS) TEMPALT Development: VCS TEMPALT Development	2	2020	4	2021
Search Integration Into Tech Baseline: Cooperative Development with IWS5 and PMS425	1	2020	4	2021

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Exhibit R-2A, RDT&E Project Justification: PB 2022 Navy **Date:** May 2021

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604030N / <i>Rapid Prototyping, Experimentation & Dem</i>	Project (Number/Name) 1037 / MK 38 MOD 4
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COST (\$ in Millions)	Prior Years	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total	FY 2023	FY 2024	FY 2025	FY 2026	Cost To Complete	Total Cost
1037: MK 38 MOD 4	1.800	21.100	9.557	0.000	-	0.000	-	-	-	-	-	-
Quantity of RDT&E Articles		3	-	-	-	-	-	-	-	-		

Note

The 30mm MK 38 MOD 4 is the next version of the MK 38 Gun Weapon System (GWS). PE 0604030N Project 1037 develops the 30mm MK 38 MOD 4 and integrates it with the AEGIS combat system and shipboard sensors to address additional threats in theatre. PE 0603795N Project 2038 conducts qualification and logistics development of the 30mm MK 38 MOD 4 GWS. PE 0204228N BLI 4217 will procure and install the MK 38 MOD 4 for the Initial Capability on DDG-51 class ships.

A. Mission Description and Budget Item Justification

The MK 38 MOD 4 30mm gun weapon system (GWS) will provide additional surface ship defense capability, addressing unmanned aerial systems (UAS) and high speed maneuverable unmanned surface vehicle (USV) threats. This is a Maritime Accelerated Acquisition (MAA), which will install an Initial Capability (IC) in FY22 on DDG-51 ship class with AEGIS Baseline CP-22-1 combat system.

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)

	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
Title: MK 38 MOD 4 30mm Gun Weapon System	21.100	9.557	0.000	0.000	0.000
Articles:	3	-	-	-	-
FY 2021 Plans:					
-Continue fire control software development.					
-Conduct Preliminary Design Review and systems engineering in-process reviews.					
-Continue Gun Weapon System (GWS) integration.					
-Continue combat system integration.					
-Procured R&D Gun Weapon Systems (GWS).					
-Procure High Speed Maneuverable Surface Targets (HSMSTs).					
FY 2022 Base Plans:					
-Finish fire control software development.					
-Finish Gun Weapon System (GWS) integration.					
-Finish combat system integration.					
FY 2022 OCO Plans:					
N/A					
FY 2021 to FY 2022 Increase/Decrease Statement:					

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2020	FY 2021	FY 2022 Base	FY 2022 OCO	FY 2022 Total
FY2021 to FY2022 decreases due to completion of Initial capability prototype development utilizing RPED funds.					
Accomplishments/Planned Programs Subtotals	21.100	9.557	0.000	0.000	0.000

C. Other Program Funding Summary (\$ in Millions)

N/A

Remarks

D. Acquisition Strategy

Engineering and Technical support for integration of 30mm gun mount and electro-optical sensor with government-owned fire control system and shipboard combat system/sensors is being competitively acquired using Other Transactional Authority (OTA) through the Defense Ordnance Technology Consortium (DOTC).

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2022 Navy												Date: May 2021			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
1319 / 4				PE 0604030N / Rapid Prototyping, Experimentation & Dem				1037 / MK 38 MOD 4							
Product Development (\$ in Millions)				FY 2020		FY 2021		FY 2022 Base		FY 2022 OCO		FY 2022 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
MOD 4 GWS Development	WR	NSWC DD : Dahlgren, VA	0.000	3.215	Mar 2020	4.000	Nov 2020	0.000		-		0.000	-	-	-
Prototype Procurement	C/FFP	MSI : Rock Hill, SC	0.000	6.030	Dec 2020	0.000		0.000		-		0.000	-	-	-
Combat System Integration	WR	NSWC DD : Dahlgren, VA	0.000	1.766	Mar 2020	0.000		0.000		-		0.000	-	-	-
Procurement of 30/40mm MK 44S cannons	C/FFP	NGIS : Mesa, AZ	0.800	0.278	May 2021	0.000		0.000		-		0.000	-	-	-
Fire Control System and Gun Mount Systems Engineering	WR	NSWC DD : Dahlgren, VA	0.350	4.321	Mar 2020	3.876	Nov 2020	0.000		-		0.000	-	-	-
Operations Gun Mount Systems Engineering	WR	NSWC IHD Picatinny : Picatinny, NJ	0.350	0.650	Feb 2020	0.000		0.000		-		0.000	-	-	-
Electro-optical Sensor Systems Engineering and Interface Design	WR	NSWC CR : Crane, IN	0.300	0.430	Jul 2020	1.082	Nov 2020	0.000		-		0.000	-	-	-
Combat System Interface Update	C/CPFF	LOCKHEED MARTIN : Moorestown, NJ	0.000	1.680	Aug 2020	0.000		0.000		-		0.000	-	-	-
Gun Mount Integration	C/FFP	MSI : Rock Hill, SC	0.000	0.814	Dec 2020	0.000		0.000		-		0.000	-	-	-
Electro-optical Sensor Integration	C/FFP	MSI : Rock Hill, SC	0.000	0.316	Dec 2020	0.000		0.000		-		0.000	-	-	-
Test Surface Target Procurement	C/FFP	Gravois : Jeanerette, LA	0.000	1.000	Jun 2021	0.000		0.000		-		0.000	-	-	-
Test Air Target Procurement	WR	NAWC-AD : PAX River, MD	0.000	0.600	May 2021	0.000		0.000		-		0.000	-	-	-
Coaxial Gun Procurement & Engineering	WR	NSWC CR : Crane, IN	0.000	0.000		0.599	Nov 2020	0.000		-		0.000	-	-	-
Subtotal			1.800	21.100		9.557		0.000		-		0.000	-	-	N/A

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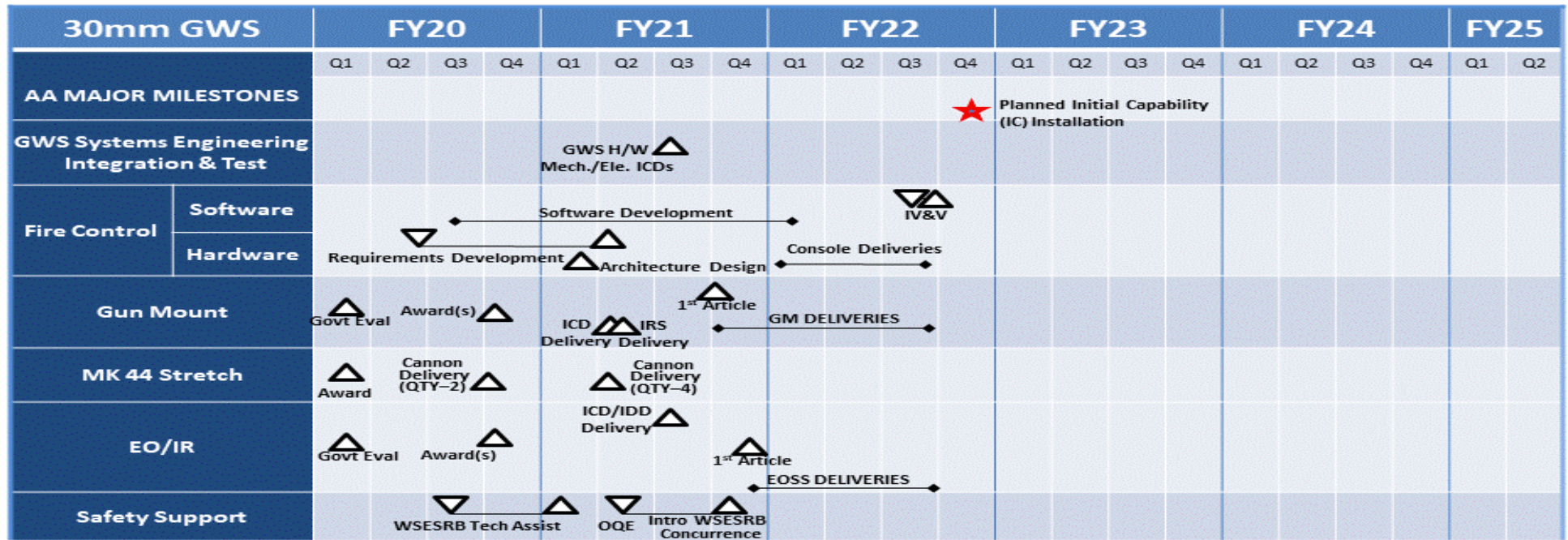
Exhibit R-4, RDT&E Schedule Profile: PB 2022 Navy

Date: May 2021

Appropriation/Budget Activity
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R-1 Program Element (Number/Name)
PE 0604030N / Rapid Prototyping, Experimentation & Dem

Project (Number/Name)
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Exhibit R-4A, RDT&E Schedule Details: PB 2022 Navy		Date: May 2021
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604030N / <i>Rapid Prototyping, Experimentation & Dem</i>	Project (Number/Name) 1037 / MK 38 MOD 4

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 1037				
MOD 4 GWS Development	1	2020	4	2022
Gun Weapon System Interface Control Drawings Development	2	2021	3	2021
Fire Control System Software and Interface Development	3	2020	1	2022
Fire Control System Software Verification and Validation	3	2022	3	2022
Remote Operator Console Development and Delivery	2	2020	3	2022
Gun Mount Deliveries	4	2021	3	2022
Cannon Deliveries	4	2020	2	2021
Electro-optical/Infrared Sensor Deliveries	4	2021	3	2022