Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy												Date: March 2023
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0204228N *I (U)SURFACE SUPPORT*							
COST ($ in Millions)	**Prior Years**	**FY 2022**	**FY 2023**	**FY 2024 Base**	**FY 2024 OCO**	**FY 2024 Total**	**FY 2025**	**FY 2026**	**FY 2027**	**FY 2028**	**Cost To Complete**	**Total Cost**
Total Program Element	156.112	13.195	12.197	8.619	-	8.619	10.702	8.834	8.900	9.309	Continuing	Continuing
3311: *Navigation Systems*	156.112	13.195	12.197	8.619	-	8.619	10.702	8.834	8.900	9.309	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Surface Support RDT&E funding will be used for the research, design, development, integration testing, and documentation of the Inertial Navigation System (INS) AN/WSN-12 for all Navy ships and submarines. The INS provides mission critical ship position and attitude data to shipboard sensors (such as radars), combat and weapon systems. The INS uses data from the Global Positioning System (GPS) to periodically update (i.e., reset) its position and internal clock. The INS is the ship's primary position source in the absence of GPS, and it consists of an Inertial Sensor Module (ISM) and a Navigation Processing Module (NPM) that will provide a significant improvement with respect to attitude and velocity data over previous INS. RDT&E funding will support continued system design to create a baseline for Pre-Production Units (PPU), Low Rate Initial Production (LRIP), and Full Rate Production (FRP).

To increase overall Navy cybersecurity efficiency, starting in FY24, the cybersecurity work associated with the Afloat Navigation Cyber Hardening, Observation, and Response (ANCHOR) program will be executed by Situational Awareness Boundary Enforcement and Response (SABER). SABER is the research, design, development, testing, and installation of Cybersecurity solutions for installed integrated computer networks to include shipboard Hull Mechanical and Electrical (HM&E), Navigation Systems, Combat Systems, Fire Control, Sonar, Radar, Communications and other shipboard computerized control systems for all afloat U.S. Navy platforms.

Time and Frequency Distribution System-Replacement (TFDS-R) funding will be used for the research, development, documentation, and integration testing for the submarine TFDS-R system. TFDS is a Commercial Off the Shelf (COTS) timing system utilizing the precision source signals of GPS to discipline two redundant Rubidium clocks to Universal Coordinated Time (UTC). TFDS provides common time to submarine equipment that utilizes clocking pulses or sinusoidal waveforms for proper operation and maintains accurate time in the event of loss of GPS input (holdover). TFDS uses multiple input power sources for redundancy and provides a built in battery backup. TFDS generates and distributes Precision Time and Timing Interval (PTTI) reference signals to support C4I capabilities needed for Joint, Naval and Allied missions.

Military GPS User Equipment (MGUE) will provide assured Positioning, Navigation, and Timing (PNT) in a GPS degraded environment. Funding will be used for the development of interface and performance requirements, shipboard system architecture definition, and MGUE integration.

Submarine Speed Sensors will provide investigation, development, testing and integration of new Own-Ship Speed sensors to address new capabilities, reduce detection, and improve reliability.

Assured Positioning, Navigation, and Timing (APNT) funding will be used for Alternate GPS-independent sources of Positioning, Velocity, Attitude, and Timing (PVAT) data required to provide fire control solutions, ensure safety of navigation, and support aircraft and combat operations in a GPS degraded/denied environment. This

effort provides a secure navigation method using the navigation resources being developed by Office of Naval research (ONR) Future Naval Capabilities (FNC) activity and Small Business Innovation Research (SBIR).

Automated Celestial Navigation System (ACNS) funding will be used for the research, development, Engineering Development Model (EDM), documentation and integration testing of the celestial navigation solution for the NoGAPSS navigation implementation on the fleet. Efforts will leverage ONR celestial navigation research into a reproducible ruggedized system fully integrated into the navigation suite.

After review, the Navigation as a Service (NaaS) initiative was defunded in FY23 due to higher priority Navy needs.

B. Program Change Summary ($ in Millions)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Previous President's Budget	13.733	12.197	20.301	-	20.301
Current President's Budget	13.195	12.197	8.619	-	8.619
Total Adjustments	-0.538	0.000	-11.682	-	-11.682
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.538	0.000			
• Program Adjustments	0.000	0.000	-11.987	-	-11.987
• Rate/Misc Adjustments	0.000	0.000	0.305	-	0.305

Change Summary Explanation

The FY 2024 funding request was reduced by $11.987 million primarily due to divestment of $38.9M RDTEN across the FYDP for NAV Cybersecurity, APNT, and NaaS.

R-4 PROGRAM SCHEDULE CHANGES:
AN/WSN-12: The development and testing timeline as well as the subsequent production timelines have been updated in FY22-FY25 to reflect the latest program status.

Cybersecurity: Based on the divestment of funding starting in FY24, the schedule has been updated to complete the R&D effort by FY23.

TFDS: The schedule has been updated to reflect the lack of funding (RDTEN and OPN) starting in FY23.

ACNS: The schedule has been updated based on the latest development and testing status which also reflects ship installation moving from Q4 FY24 to Q1 FY25

Exhibit R-2, RDT&E Budget Item Justification: PB 2024 Navy	Date: March 2023
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0204228N *I (U)SURFACE SUPPORT*

APNT: The schedule reflects the divestment of funding starting in FY24.

NaaS: The schedule reflects the divestment of funding starting in FY23.

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy											Date: March 2023	
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0204228N / *(U)SURFACE SUPPORT*				Project (Number/Name) 3311 / *Navigation Systems*			
COST ($ in Millions)	**Prior Years**	**FY 2022**	**FY 2023**	**FY 2024 Base**	**FY 2024 OCO**	**FY 2024 Total**	**FY 2025**	**FY 2026**	**FY 2027**	**FY 2028**	**Cost To Complete**	**Total Cost**
3311: *Navigation Systems*	156.112	13.195	12.197	8.619	-	8.619	10.702	8.834	8.900	9.309	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Surface Support RDT&E funding will be used for the research, design, development, integration testing, and documentation of the Inertial Navigation System (INS) AN/WSN-12 for all Navy ships and submarines. The INS provides mission critical ship position and attitude data to shipboard sensors (such as radars), combat and weapon systems. The INS uses data from the Global Positioning System (GPS) to periodically update (i.e., reset) its position and internal clock. The INS is the ship's primary position source in the absence of GPS, and it consists of an Inertial Sensor Module (ISM) and a Navigation Processing Module (NPM) that will provide a significant improvement with respect to attitude and velocity data over previous INS. RDT&E funding will support continued system design to create a baseline for Pre-Production Units (PPU), Low Rate Initial Production (LRIP), and Full Rate Production (FRP).

To increase overall Navy cybersecurity efficiency, starting in FY24, the cybersecurity work associated with the Afloat Navigation Cyber Hardening, Observation, and Response (ANCHOR) program will be executed by Situational Awareness Boundary Enforcement and Response (SABER). SABER is the research, design, development, testing, and installation of Cybersecurity solutions for installed integrated computer networks to include shipboard Hull Mechanical and Electrical (HM&E), Navigation Systems, Combat Systems, Fire Control, Sonar, Radar, Communications and other shipboard computerized control systems for all afloat U.S. Navy platforms.

Time and Frequency Distribution System-Replacement (TFDS-R) funding will be used for the research, development, documentation, and integration testing for the submarine TFDS-R system. TFDS is a Commercial Off the Shelf (COTS) timing system utilizing the precision source signals of GPS to discipline two redundant Rubidium clocks to Universal Coordinated Time (UTC). TFDS provides common time to submarine equipment that utilizes clocking pulses or sinusoidal waveforms for proper operation and maintains accurate time in the event of loss of GPS input (holdover). TFDS uses multiple input power sources for redundancy and provides a built in battery backup. TFDS generates and distributes Precision Time and Timing Interval (PTTI) reference signals to support C4I capabilities needed for Joint, Naval and Allied missions.

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Assured Positioning, Navigation, and Timing (APNT) funding will be used for Alternate GPS-independent sources of Positioning, Velocity, Attitude, and Timing (PVAT) data required to provide fire control solutions, ensure safety of navigation, and support aircraft and combat operations in a GPS degraded/denied environment. This effort provides a secure navigation method using the navigation resources being developed by Office of Naval research (ONR) Future Naval Capabilities (FNC) activity and Small Business Innovation Research (SBIR).

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204228N / *(U)SURFACE SUPPORT*	**Project (Number/Name)** 3311 / *Navigation Systems*

Automated Celestial Navigation System (ACNS) funding will be used for the research, development, Engineering Development Model (EDM), documentation and integration testing of the celestial navigation solution for the NoGAPSS navigation implementation on the fleet. Efforts will leverage ONR celestial navigation research into a reproducible ruggedized system fully integrated into the navigation suite.

After review, the Navigation as a Service (NaaS) initiative was defunded in FY23 due to higher priority Navy needs

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Title: AN/WSN-12 Inertial Navigation System - Replacement (INS-R)	2.462	2.372	3.000	0.000	3.000
Articles:	-	-	-	-	-
FY 2023 Plans: Complete AN/WSN-12 development Complete AN/WSN-12 testing Conduct Production Readiness Review (PRR) Complete ISM FRP Complete NPM LRIP Begin AN/WSN-12 follow-on development					
FY 2024 Base Plans: Continue NPM production Continue AN/WSN-12 follow-on development					
FY 2024 OCO Plans: N/A					
FY 2023 to FY 2024 Increase/Decrease Statement: $0.628M increase due to AN/WSN-12 follow-on development efforts.					
Title: Cybersecurity	1.500	0.672	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2023 Plans: Complete NAV Enclave Cross Domain Solution (CDS) Phase II Complete ANCHOR increment I development					
FY 2024 Base Plans: N/A					
FY 2024 OCO Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204228N / *(U)SURFACE SUPPORT*	**Project (Number/Name)** 3311 / *Navigation Systems*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** $0.672 decrease due to funding realignment for Cybersecurity starting in FY24					
Title: Time Frequency Distribution System (TFDS) Replacement	0.500	0.000	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2023 Plans: TFDS EQT to be completed in FY23 ***FY 2024 Base Plans:*** None ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** No change					
Title: Military GPS User Equipment (MGUE)	3.556	0.800	1.724	0.000	1.724
Articles:	-	-	-	-	-
FY 2023 Plans: Conduct TI-22 early integration and testing ***FY 2024 Base Plans:*** Complete TI-22 early integration and testing ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** $0.924M increase due to continuation of M-code integration and testing					
Title: Submarine Speed Sensors (SSS)	0.900	0.400	0.400	0.000	0.400
Articles:	-	-	-	-	-
FY 2023 Plans: Complete TEMPALT update Complete EQT Continue Indicator Transmitter Tech Refresh					

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204228N / *(U)SURFACE SUPPORT*	**Project (Number/Name)** 3311 / *Navigation Systems*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
Begin new speed sensor research ***FY 2024 Base Plans:*** Continue new speed sensor research Complete Indicator Transmitter Tech Refresh ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** No change in funding					
Title: Assured Positioning, Navigation, and Timing (APNT)	3.200	1.150	0.000	0.000	0.000
Articles:	-	-	-	-	-
FY 2023 Plans: Integrate ACNS with GPS Based Positioning, Navigation, and Timing Service (GPNTS) in accordance with ACNS Top Level Requirements Document ***FY 2024 Base Plans:*** N/A ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** $1.150M decrease due to realignment by sponsor for APNT starting in FY24					
Title: Automated Celestial Navigation System (ACNS)	0.372	6.256	2.707	0.000	2.707
Articles:	-	-	-	-	-
FY 2023 Plans: Complete system development Continue testing and evaluation ***FY 2024 Base Plans:*** Complete system testing and evaluation ***FY 2024 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204228N / *(U)SURFACE SUPPORT*	**Project (Number/Name)** 3311 / *Navigation Systems*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total
N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** $3.549M decrease due to final phase of development efforts					
Title: Navigation as a Service (NaaS) / Computing Infrastructure (formerly Navigation Suite) ***Articles:*** ***FY 2023 Plans:*** After review, the Navigation as a Service (NaaS) initiative was defunded in FY22 due to higher priority Navy needs ***FY 2024 Base Plans:*** None ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** N/A	0.500 -	0.000 -	0.000 -	0.000 -	0.000 -
Title: Navigation Support ***Articles:*** ***FY 2023 Plans:*** Provide engineering, logistics, and programmatic support for AN/WSN-12, Cybersecurity, MGUE, SSS, ACNS, and APNT ***FY 2024 Base Plans:*** Provide engineering, logistics, and programmatic support for AN/WSN-12, MGUE, and SSS including system integration, testing, and evaluation at multiple land-based and shipboard sites ***FY 2024 OCO Plans:*** N/A ***FY 2023 to FY 2024 Increase/Decrease Statement:*** $0.241M increase to support various Navigation development efforts including system integration, testing, and evaluation at multiple land-based and shipboard sites	0.205 -	0.547 -	0.788 -	0.000 -	0.788 -
Accomplishments/Planned Programs Subtotals	13.195	12.197	8.619	0.000	8.619

Exhibit R-2A, RDT&E Project Justification: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204228N / *(U)SURFACE SUPPORT*	**Project (Number/Name)** 3311 / *Navigation Systems*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2022	FY 2023	FY 2024 Base	FY 2024 OCO	FY 2024 Total	FY 2025	FY 2026	FY 2027	FY 2028	Cost To Complete	Total Cost
• OPN/0670: *Other Navigation*	72.300	87.800	110.286	-	110.286	91.772	100.724	84.649	87.303	Continuing	Continuing

Remarks

D. Acquisition Strategy

AN/WSN-12 Inertial Sensor Module (ISM) CPIF/CPFF/FFP contract competitively awarded in FY 2016. Contract includes options for conducting R&D milestones, manufacture of Engineering Development Models (EDM) and Pre-Production Units (PPU), and manufacture of Low Rate Initial Production (LRIP) and Full Rate Production (FRP).

Assured Positioning, Navigation, and Timing (APNT) has added new program milestones to list future developmental efforts to provide alternate sources of PNT data in a GPS
degraded/denied environment.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204228N / *(U)SURFACE SUPPORT*	Project (Number/Name) 3311 / *Navigation Systems*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering/ Design	WR	SPAWAR Atlantic : Little Creek, VA	25.795	2.248	Oct 2021	1.250	Oct 2022	1.402	Oct 2023	-		1.402	Continuing	Continuing	Continuing
Systems Engineering/ Design	WR	SPAWAR Pacific : San Diego, CA	1.875	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering/ Design	C/CPFF	WR Systems : Norfolk, VA	23.127	4.908	Oct 2021	6.379	Oct 2022	2.574	Oct 2023	-		2.574	Continuing	Continuing	Continuing
Systems Engineering/ Design	C/CPFF	Penn State/ARL : Warminster, PA	5.168	0.150	Oct 2021	0.100	Oct 2022	0.200	Oct 2023	-		0.200	Continuing	Continuing	Continuing
Systems Engineering/ Design	WR	NSWC Dahlgren : Dahlgren, VA	6.959	3.000	Oct 2021	1.279	Oct 2022	0.933	Oct 2023	-		0.933	Continuing	Continuing	Continuing
Systems Engineering/ Design	WR	NSWC Dam Neck : Dam Neck, VA	0.340	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering/ Design	WR	NSWC PHD : Port Hueneme, CA	0.122	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering/ Design	WR	NUWC Newport : Newport, RI	1.080	0.300	Oct 2021	0.150	Oct 2022	0.200	Oct 2023	-		0.200	Continuing	Continuing	Continuing
Systems Engineering/ Design	C/CPFF	Old Dominion University : Suffolk, VA	0.450	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering/ Design	C/CPFF	Northrop Grumman : Charlottesville, VA	46.022	0.212	Oct 2021	0.300	Oct 2022	0.800	Oct 2023	-		0.800	Continuing	Continuing	Continuing
Systems Engineering/ Design	WR	SPAWAR Atlantic : Charleston, SC	1.530	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering/ Design	WR	NSWC Philadelphia : Philadelphia, PA	1.537	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering/ Design	C/CPFF	Electric Boat : Groton, CA	0.953	0.000		0.000		0.000		-		0.000	Continuing	Continuing	Continuing
Systems Engineering/ Design	C/CPFF	John Hopkins, APL : Laurel, MD	23.427	1.800	Oct 2021	0.643	Oct 2022	0.100	Oct 2023	-		0.100	Continuing	Continuing	Continuing
Systems Engineering/ Design	C/CPFF	Draper : Cambridge, MA	7.811	0.372	Oct 2021	1.549	Oct 2022	1.957	Oct 2023	-		1.957	Continuing	Continuing	Continuing
Systems Engineering/ Design	WR	NSWC Crane : Crane, IN	0.121	0.000		0.000		0.000		-		0.000	0.000	0.121	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2024 Navy			Date: March 2023
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0204228N / *(U)SURFACE SUPPORT*	Project (Number/Name) 3311 / *Navigation Systems*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering/ Design	WR	Submarine Special Projects : Washington, DC	0.000	0.000		0.000		0.000		-		0.000	0.000	0.000	-
Systems Engineering/ Design	MIPR	COMOPTEVFOR : Norfolk, VA	0.021	0.000		0.000		0.200	Oct 2023	-		0.200	0.000	0.221	-
Systems Engineering/ Design	WR	SPAWAR 5.0 : San Diego, CA	0.093	0.000		0.000		0.000		-		0.000	0.000	0.093	-
Systems Engineering/ Design	TBD	Carnegie Mellon : Not Specified	0.400	0.000		0.000		0.000		-		0.000	0.000	0.400	-
		Subtotal	146.831	12.990		11.650		8.366		-		8.366	Continuing	Continuing	N/A

Remarks

The decrease in Product Development Contracts from FY23 to FY24 is due to the significant divestment of RDTEN funding for Cybersecurity, APNT, and NaaS ($11.987M) in FY24.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2022 Cost	FY 2022 Award Date	FY 2023 Cost	FY 2023 Award Date	FY 2024 Base Cost	FY 2024 Base Award Date	FY 2024 OCO Cost	FY 2024 OCO Award Date	FY 2024 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Program Management	C/CPFF	Various : Not Specified	9.281	0.205	Oct 2021	0.547	Oct 2022	0.253	Oct 2023	-		0.253	Continuing	Continuing	Continuing
		Subtotal	9.281	0.205		0.547		0.253		-		0.253	Continuing	Continuing	N/A

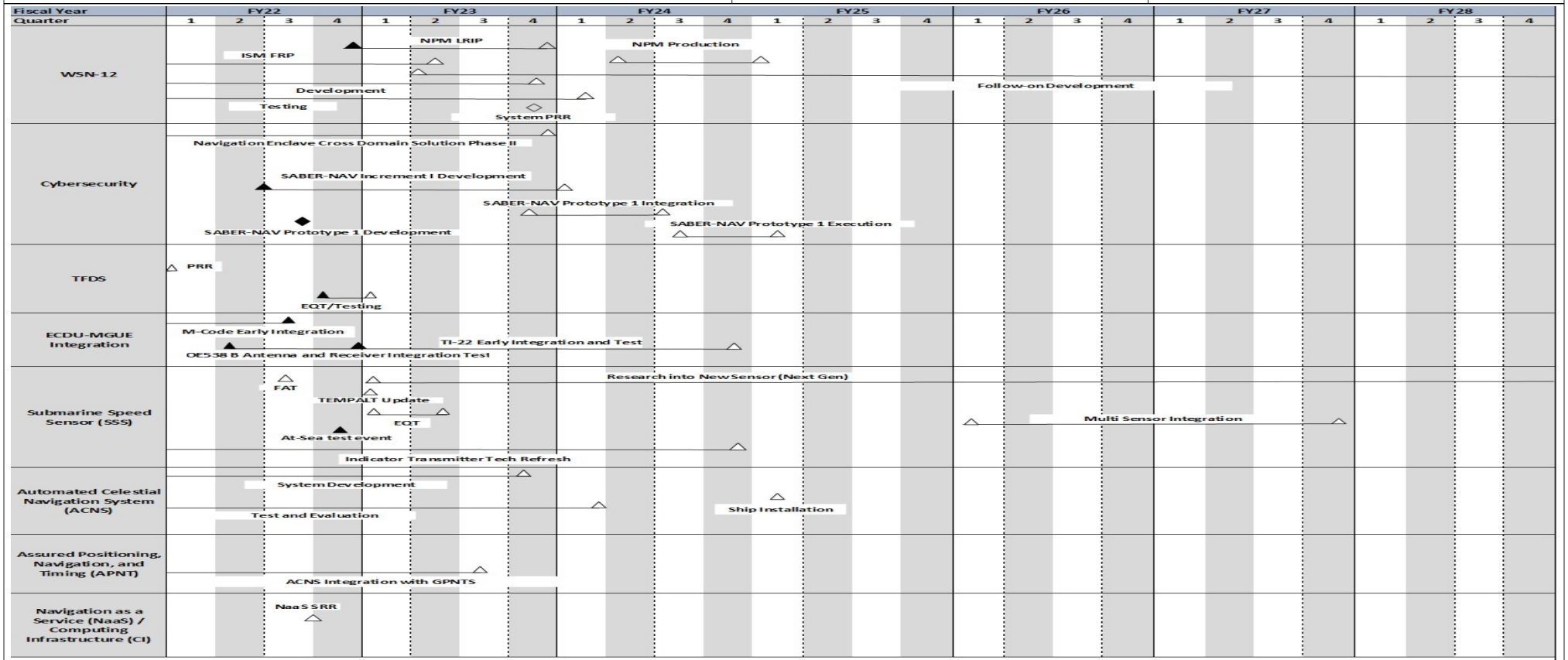
Remarks

The decrease in Program Management Support contract from FY23 to FY24 is due to completion of the initial development efforts for AN/WSN-12 and ACNS in FY23

	Prior Years	FY 2022		FY 2023		FY 2024 Base		FY 2024 OCO		FY 2024 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	156.112	13.195		12.197		8.619		-		8.619	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204228N / *(U)SURFACE SUPPORT*	**Project (Number/Name)** 3311 / *Navigation Systems*



Acronym List:
- ACNS: Automated Celestial Navigation System
- AoA: Analysis of Alternatives
- APNT: Assured Position, Navigation and Timing
- BDC: Boundary Defense Capability
- CDR: Critical Design Review
- CDS: Cross Domain Solution
- CPD: Capability Production Document
- DOTC: Defense Ordnance Technology Consortium
- ECDU: Enhanced Control Display Unit
- EDM: Eningeering Development Model
- EQT: Environment Qualification Test
- FRP: Full Rate Production
- FAT: Factory Acceptance Test
- FOT&E: Follow-on Test and Evaluation
- HAE2: Host Application Equipment
- HW: Hardware
- ILA: Integrated Logistics Assessment
- IOT&E: Initial Operational Test and Evaluation
- ISM: Inertial Sensor Module
- LRIP: Low Rate Initial Production
- M-Code: Military Code
- NPM: Navigation Processor Module
- OTRR: Operational Test Readiness Review
- OTA: Other Transaction Agreement
- PDR: Preliminary Design Review
- PPU: Pre-Production Unit
- PRR: Production Readiness Review
- SCDU: Secondary Control Display Unit
- SRR: System Requirements Review
- SW: Software
- SSDS: Ship Self Defense System
- TEMP: Test and Evaluation Master Plan
- TFDS-R: Time Frequency Distribution System Replacement
- TRD: Technical Requirements Document

△ Planned Event Completion
▲ Actual Event Completion
◇ Critical Milestone
◆ Actual Milestone Completion

Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204228N / *(U)SURFACE SUPPORT*	**Project (Number/Name)** 3311 / *Navigation Systems*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
3311 RDTE				
AN/WSN-12: ISM Production: AN/WSN-12 ISM FRP	1	2022	2	2023
AN/WSN-12: NPM Production: AN/WSN-12 NPM LRIP	4	2022	4	2023
AN/WSN-12: NPM Production: AN/WSN-12 NPM Production	2	2024	1	2025
AN/WSN-12: AN/WSN-12 Development	1	2022	4	2023
AN/WSN-12: AN/WSN-12 Testing	1	2022	1	2024
AN/WSN-12: AN/WSN-12 System PRR	4	2023	4	2023
AN/WSN-12: AN/WSN-12 Follow-on Development	2	2023	4	2028
Cybersecurity: Cybersecurity Navigation Enclave Cross Domain Solution Phase II	1	2022	4	2023
Cybersecurity: Cybersecurity SABER-NAV Increment I Development	2	2022	1	2024
Cybersecurity: Cybersecurity SABER-NAV Prototype 1 Development	3	2022	3	2022
Cybersecurity: Cybersecurity SABER-NAV Prototype 1 Integration	4	2023	3	2024
Cybersecurity: Cybersecurity SABER-NAV Prototype 1 Execution	3	2024	1	2025
TFDS: TFDS-R EQT/Testing	4	2022	1	2023
TFDS: TFDS-R PRR	1	2022	1	2022
MGUE: MGUE M-Code Integration	1	2022	3	2022
MGUE: MGUE OE538B Antenna and Receiver Integration Test	2	2022	4	2022
MGUE: MGUE TI-22 Early Integration and Test	4	2022	1	2025
SSS: SSS TEMPALT Update	1	2023	1	2023
SSS: SSS At-Sea Test Event	4	2022	4	2022
SSS: SSS FAT	3	2022	3	2022
SSS: SSS EQT	1	2023	2	2023
SSS: SSS Research New Sensor	1	2023	4	2028

Exhibit R-4A, RDT&E Schedule Details: PB 2024 Navy		Date: March 2023
Appropriation/Budget Activity 1319 / 7	**R-1 Program Element (Number/Name)** PE 0204228N / *(U)SURFACE SUPPORT*	**Project (Number/Name)** 3311 / *Navigation Systems*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
SSS: SSS Indicator-Transmitter Tech Refresh	1	2022	4	2024
SSS: SSS Multi Sensor Integration	1	2026	4	2027
ACNS: ACNS System Development	1	2022	4	2023
ACNS: ACNS System Test and Evaluation	1	2022	1	2024
ACNS: ACNS Ship Installation	1	2025	1	2025
APNT: ACNS Integration with GPNTS	1	2022	3	2023
NaaS: NaaS SRR	4	2022	4	2022