Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Navy	Date: March 2019
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy* / BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604245M / *H-1 Upgrades*

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	0.000	0.000	54.320	65.359	-	65.359	77.151	59.678	38.691	14.459	Continuing	Continuing
3359: *H-1 Improvements*	0.000	0.000	54.320	65.359	-	65.359	77.151	59.678	38.691	14.459	Continuing	Continuing

A. Mission Description and Budget Item Justification

The mission of the AH-1 attack helicopter is to provide rotary wing close air support, anti-armor, armed escort, armed/visual reconnaissance, survivability enhancements, and fire support coordination capabilities under day/night and adverse weather conditions. The mission of the UH-1 utility helicopter is to provide command and control and combat assault support under day/night and adverse weather conditions and special operations support; supporting arms coordination and aeromedical evacuation. Major modifications for both aircraft include 37 AH-1Ws converted to AH-1Zs, build 152 new AH-1Zs, remanufacture ten (10) H-1N helicopters and build 150 new UH-1Y models. AH-1Z and UH-1Y models include a 4-bladed, composite rotor system with semi-automatic bladefold, performance-matched transmissions, T700 Engine Digital Electronic Control Units, 4-bladed tail rotors and drive systems, more effective stabilizers, upgraded landing gear, and common, fully integrated cockpits and avionics systems. These upgrades add 10,000 flight hours to AH-1Z/UH-1Y airframes. The fully integrated cockpits reduce operator workload and improve situational awareness, thus increasing safety and reducing the rate of aircraft attrition. They provide considerable growth potential for future weapon systems and avionics to significantly increase mission effectiveness and survivability. The cockpits also include integration of onboard mission planning, communications, digital fire control, self-navigation, night navigation/targeting, air-to-ground missile and air-launched intercept missile weapon systems management in nearly identical crew stations, which significantly reduces training requirements. These upgrades maximize commonality between the two aircraft and provide needed improvements in crew and passenger survivability, payload, power available, endurance, range, airspeed, maneuverability and supportability.

This budget is required for follow-on improvements to H-1 aircraft via integration of sensors and weapons, avionics, and air vehicle components that will address deficiencies, systems safety, obsolescence, readiness, reliability, supportability, and relevance in the battlespace. Improvements will include all associated System Configuration Set (SCS) updates as well as integration and testing related to the aircraft platforms.

JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under OPERATIONAL SYSTEMS DEVELOPMENT because it includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate funding in the current or subsequent fiscal years.

Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Navy					Date: March 2019
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy* / BA 5: *System Development & Demonstration (SDD)*			R-1 Program Element (Number/Name) PE 0604245M / *H-1 Upgrades*		
B. Program Change Summary ($ in Millions)	**FY 2018**	**FY 2019**	**FY 2020 Base**	**FY 2020 OCO**	**FY 2020 Total**
Previous President's Budget	0.000	58.097	75.951	-	75.951
Current President's Budget	0.000	54.320	65.359	-	65.359
Total Adjustments	0.000	-3.777	-10.592	-	-10.592
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-3.777			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	0.000	0.000	-10.600	-	-10.600
• Rate/Misc Adjustments	0.000	0.000	0.008	-	0.008

Change Summary Explanation

FY 2019 includes a Congressional reduction of $3.777 million for unclear budget justification.

The FY 2020 funding request was reduced by $6.00 million to account for the availability of prior year execution balances.

The FY 2020 funding was reduced due to internal USMC re-prioritization of funding for higher priority service requirements.

Funds increase from FY2019 to FY2020 due to flight testing for Target Sight System Block Upgrade with Optimized TopOwl improvements, specifically to address Transfer Alignment for weapons employment and Degraded Visual Environment (DVE)options; to support airworthiness integration of the AIM-9X, Jettison Testing of the Intrepid Tiger (IT-IIV3); correction of software issues associated with the Brite STAR II Laser Spot Tracker (LST); and Distributed Aperture Infrared Countermeasures (DAIRCM) software testing for putting the system under glass.

Technical: None

Schedule: System Configuration Sets (SCS) will be continuously developed and released in conjunction with required hardware obsolescence and capability improvements. Software development as a whole are accounted for separately on the R-3 and are apportioned into development efforts for Avionics and Sensors & Weapons on the R-2a. Software is no longer portrayed separately on the R-2a or R-4 since SCS builds are linked to the development of hardware. The Mission Description section for Avionics and Sensors and Weapons state that SCS is part of each of the projects.

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604245M / *H-1 Upgrades*	Project (Number/Name) 3359 / *H-1 Improvements*	

COST ($ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
3359: *H-1 Improvements*	0.000	0.000	54.320	65.359	-	65.359	77.151	59.678	38.691	14.459	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The objective of H-1 Improvements is to provide follow-on Research, Development, Test and Evaluation efforts in support of all H-1 aircraft.

Air Vehicle and Engine improvements include analysis of structural data to formulate Damage Limits and Tolerances for structural components to reduce life cycle costs and maintenance workload; and redesign of structural components and drive system components to minimize excessive and premature wear, increase reliability, and improve existing design deficiencies. Additional air vehicle upgrades include: redesign of the aircraft power-generating and electrical components (generators, inverters, wiring) to support power requirements for existing and future systems (Aircraft Survivability Equipment, emerging electronic warfare, and Degraded Visual Environment), redesign of the Environmental Control System /Thermal Redesign to support cooling of Technology Refresh Mission Computer and other avionics, redesign to add an auxiliary fuel capability, Intrepid Tiger, and upgrades the UH-1Y cabin floor panels.

Avionics improvements target digital inter-operability, integrated avionics, safety & survivability, and situational awareness for both the pilot and aircrew safety. This includes integrating Joint Battle Command-Platform (JBC-P), Full Motion Video (FMV), Degraded Visual Environment (DVE), Helmet Mounted Display improvements, cockpit displays, precision and GPS non-precision landing capability, Crash Survivable Flight Incident Recorder, collision avoidance, improved Embedded Global Positioning System (EGI), Inertial Navigation System (INS), targeting sensor systems and mission computer. H-1 capability improvements include improved Aircraft Survivability Equipment (ASE), digital operations & transfer of data, digital interoperability, digital video recording, video and data networking, and information integration with aviation combat elements and Marine Air Ground Task Force elements. Mandated capability efforts include - Communications, Navigation and Surveillance system/ Air Traffic Management (CNS/ATM), Required Navigation Performance/Area Navigation (RNP/RNAV), GPS Selective Availability Anti-Spoofing Module (SAASM), Automatic Dependent Surveillance - Broadcast (ADS-B), Crash Survivable Flight Incident Recorder, development efforts required for Depot standup and incorporation of technology and information protection/Information Assurance in critical avionics and sensor systems. In addition, the goal is to reduce total ownership cost for H-1 aircraft and related support systems by improving reliability and maintainability of critical flight and avionics systems along with associated peculiar avionics support equipment and incorporating fact-of-life obsolescence solutions. All avionics improvements include related System Configuration Set (SCS) development updates and testing.

Sensors, Weapons and Helmet Mounted Display System improvements include, manufacturing process improvements, hardware and software redesign to improve reliability, improve production methodologies, implement program security initiatives and increase the collective capability to address emerging battlefield threats. These improvements also address reliability and obsolescence, which collectively enhance Fleet readiness. The technical interface between the aircraft sensor, helmet and weapons is increasingly challenging to effectively employ advanced precision guided weapons and Aircraft Survivability Equipment (ASE) for the interface between the sensors, helmet and precision guided munitions. These systems require extensive software and hardware upgrades that translate into meaningful, sensor fusion based solutions, to provide both battlefield and situational awareness to the H1 platform. Specifically, the AN/ALQ-30 Target Sight System (TSS) will implement several block upgrade efforts with improvements to the IR Pointer, Laser and Cameras as well as adding capabilities such as Laser Spot Tracker and High Definition Video. The Optimized TopOwl (OTO) optics upgrades, reliability, additive manufacturing initiatives, will address multiple human factor improvements, to include Degraded

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
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Visual Environment (DVE), as well as advanced boresighting and mapping improvements to improve weapons accuracy. The Digital Interoperability of the Helmet and Sensor will extend to improvements in ASE and Smart Dispense Technologies to improve aircraft survivability. Radar and Missile Warning improvements, including APR-39D(V)2 and the Distributed Aperture Infrared Countermeasures (DAIRCM), require extensive integration and testing. Development, test and integration efforts with the Advanced Precision Kill Weapons (APKWS), M299 Launcher improvements, Digital Rocket Launcher (DRL), AIM-9X, the AN/ALQ-231 (V) Intrepid Tiger II Electronic Warfare Pod and the Joint Air-to-Ground Missile (JAGM) Hellfire missile will follow in FY18. Improving and integrating weapon systems will align with these upgrades to improve the overall accuracy, lethality and survivability of the H1 platform.

These improvements will provide considerable growth potential for future weapon systems, air vehicle improvements, software improvements, and avionics upgrades, which will significantly increase mission effectiveness & survivability, while potentially reducing life cycle costs. The cockpits will also include integration of onboard mission planning, communications, digital fire control, self-navigation, night navigation/targeting, precision guided munitions, and air-launched intercept missile weapon systems management in nearly identical crew stations, which significantly reduce training requirements. These upgrades maximize commonality between all H-1 Type/Model/Series aircraft and provide needed improvements in crew and passenger reliability, survivability, payload, power available, endurance, range, airspeed, maneuverability and supportability.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Weapons and Sensors Testing and Integration	0.000	7.648	17.354	0.000	17.354
Articles:	-	-	-	-	-
FY 2019 Plans: Conduct prototype developmental testing of TSS Block Upgrade initiatives, to include software compatibility and high definition video feed to the Optimized Top Owl HMSD (Helmet Mounted Sight Display). Conduct HMSD optics testing, digital upgrades and Sensor/ASE interfaces. Continue enhanced digital capability efforts, Aircraft Survivability Equipment (ASE) improvements, Helmet Mounted Display improvements, with full visor integration and display enhancements, systems obsolescence mitigation efforts, as well as opportunities to improve support and test equipment modifications.					
FY 2020 Base Plans: Continue prototype developmental testing of TSS Block Upgrade initiatives, to include software compatibility, transfer alignment corrections and high definition video feed to the Optimized Top Owl HMSD (Helmet Mounted Sight Display). Conduct HMSD optics testing, digital upgrades and Sensor/ASE interfaces, to include TopOwl integration of binocular optics. Continue enhanced digital capability efforts, Aircraft Survivability Equipment (ASE) improvements, Helmet Mounted Display improvements, with full visor integration and display enhancements, systems obsolescence mitigation efforts and test Degraded Visual Environment (DVE) solutions with TSS and OTO interfaces. Conduct testing and evaluation of Intrepid Tiger IT-IIV3 and Distributed Aperture Infrared Countermeasures.					
FY 2020 OCO Plans:					

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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase in funding from FY 2019 to FY 2020 due to flight testing requirements for TSS Block Upgrade with OTO improvements, specifically to address Transfer Alignment for weapons employment and DVE options. Additionally, funds are required to support airworthiness integration of the AIM-9X, Jettison Testing of the Intrepid Tiger (IT-IIV3), and software improvements with the Brite STAR II LST and Distributed Aperture Infrared Countermeasures (DAIRCM).					
Title: Air Vehicle and Engines Improvements	0.000	25.064	27.370	0.000	27.370
Articles:	-	-	-	-	-
FY 2019 Plans: Continue redesign of structural components to minimize excessive and premature wear, increase reliability, increase aircraft load capabilities, and improve existing design deficiencies. Continue redesign of the fuel system. Continue redesign of the aircraft electrical power-generating components and aircraft re-wiring to support power requirements for existing and future systems to include stores select-ability, future Avionics Survivability Equipment (ASE), emerging Electronic Warfare (EW), and Degraded Visual Environment (DVE) systems. Continue redesign of the Environmental Control Systems/Thermal to support other avionics on the UH-1Y/AH-1Z. Continue redesign of the drive system components (rotor brake/slip ring/standpipe/gearboxes/ drive shaft and couplers/chip detectors) to increase reliability and reduce high cost and/or failure rates. Continue upgrades and redesign of main and tail rotor blades. Continue survivability upgrades (canted forward chaff buckets, blast frag canopy, opaque armor, self-sealing fuel tanks, sump and backing board). Continue UH-1Y structural improvement program to increase capability including Intrepid Tiger, auxiliary fuel, cabin floor boards to prevent corrosion, floor panel access, and other structural reinforcements.					
FY 2020 Base Plans: Continue redesign and initiate test of structural components to minimize excessive and premature wear, increase reliability, increase aircraft load capabilities, and improve existing design deficiencies including: the fuel system; the aircraft electrical power-generating components and aircraft re-wiring to support power requirements for existing and future systems to include stores select-ability, future Avionics Survivability Equipment (ASE), emerging Electronic Warfare (EW), and Degraded Visual Environment (DVE) systems; the Environmental Control Systems/Thermal to support other avionics on the UH-1Y/AH-1Z; the drive system components (rotor brake/slip ring/standpipe/gearboxes/drive shaft and couplers/chip detectors) to increase reliability and reduce high cost and/or failure rates; main and tail rotor blades including tail rotor mast. Continue survivability upgrades on canted forward chaff buckets, blast frag canopy, opaque armor, self-sealing fuel tanks, sump and backing					

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
board. Continue UH-1Y structural improvements to increase capability including auxiliary fuel; cabin floor boards to prevent corrosion; floor panel access and other structural reinforcements. Initiate UH-1Y and AH-1Z structural improvements on composite elevator. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Increase in funding from FY2019 to FY2020 due to increase in design and test efforts in support of UH-1Y/ AH-1Z structural improvement and reinforcement initiatives, component redesign efforts, and survivability upgrades.					
Title: Avionics Improvements ***Articles:*** ***FY 2019 Plans:*** Continue with software integration, Development Testing (DT) and Validation and Verification (V&V) activities associated with SCS. Support software design changes associated with SCS in support of the new JAGM capability. Continue to support Avionics Test Facility (ATF). Initiate development of requirements and software architecture for SCS to include Aircraft Network Switch (ANS), Advanced Data Transfer System (ADTS), AIM-9X, Tactical Secure Voice, Second Generation Anti-Jam Tactical UHF Radio for NATO (SATURN), and Variable Message Format (VMF) Protocol for ARC-210 RT-1939A Radio. Complete development efforts on the Mission Computer (TRMC) redesign. Continue design, development and testing for digital interoperability improvements, additional waveform functionality, avionics components / systems obsolescence mitigation efforts, peculiar avionics support equipment, automatic test equipment and mission computer SCS improvements, Satellite Communications improvement, Full Motion Video, UH-1Y Aft Cabin Display for situational awareness, portable tablet Marine Air-Ground Task Force (MAGTF) improvements, digital interoperability application of Variable Message Formatting (VMF), Aircraft Dependent Surveillance Broadcast (ADS-B), and additional waveform functionality. Continue enhancement efforts digital capability efforts, digital map and data storage capabilities, digital video recording, display systems, digital interoperability, digital systems upgrades, avionics regression testing. Initiate design and development on TAWS, Wireless Intercommunication Systems (WICS), Joint Battlefield Command - Platform (JBC-P), Mobile User Objective System (MUOS) for over the horizon communication, Degraded Visual Environment and collision avoidance capability, Embedded Global Positioning System/Inertial Navigation System (EGI) upgrade for Selective	0.000 -	21.608 -	20.635 -	0.000 -	20.635 -

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
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B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Availability Anti-Spoofing Module (SAASM), GPS non-precision approach capability and GPS signal protection efforts, Crash Survivable Flight Instrument Recorder (CSFIR), and Link tactical data exchange. ***FY 2020 Base Plans:*** Continue with software integration, Development Testing (DT) and Validation and Verification (V&V) activities associated with SCS. Support software design changes associated with SCS in support of JAGM and APR-39D(V)2. Continue to support Avionics Test Facility (ATF). Initiate development of requirements and software architecture for SCS to include Aircraft Network Switch (ANS), Advanced Data Transfer System (ADTS), AIM-9X, Tactical Secure Voice, Second Generation Anti-Jam Tactical UHF Radio for NATO (SATURN), and Variable Message Format (VMF) Protocol for ARC-210 RT-1939A Radio. Complete development efforts on the Mission Computer (TRMC) redesign. Continue design, development and testing for Digital Interoperability (DI) improvements, avionics components / systems obsolescence mitigation efforts, peculiar avionics support equipment, automatic test equipment and mission computer SCS improvements, Satellite Communications improvement, Link 16 development, Full Motion Video, UH-1Y Aft Cabin Display for situational awareness, portable tablet improvements for Marine Air-Ground Task Force, Aircraft Dependent Surveillance Broadcast (ADS-B), and waveform functionality. Continue enhancement of digital map and data storage capabilities, digital video recording, display systems, digital systems upgrades, avionics regression testing. Initiate design and development on TAWS, Wireless Intercommunication Systems (WICS), Joint Battlefield Command - Platform (JBC-P), Mobile User Objective System (MUOS) for over the horizon communication, Degraded Visual Environment and collision avoidance capability, Embedded Global Positioning System/Inertial Navigation System (EGI) upgrade for Selective Availability Anti-Spoofing Module (SAASM), GPS non-precision approach capability and GPS signal protection efforts, Crash Survivable Flight Instrument Recorder (CSFIR), and Link tactical data exchange. ***FY 2020 OCO Plans:*** N/A ***FY 2019 to FY 2020 Increase/Decrease Statement:*** Decrease in funding from FY2019 to FY2020 due to reduction of hardware development, improvement, and integration efforts.					
Accomplishments/Planned Programs Subtotals	0.000	54.320	65.359	0.000	65.359

Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy		Date: March 2019
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C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• APN/0178: *UH-1Y/AH-1Z APN1*	938.961	840.437	62.003	-	62.003	7.353	7.538	7.656	7.795	0.000	10,666.714
• APN/0178C: *UH-1Y/AH-1Z APN1 Advance Procurement*	42.082	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	500.478

Remarks

D. Acquisition Strategy

Follow-on H-1 Improvements will be developed using cost plus fixed fee type contracts.

E. Performance Metrics

Continue hardware and software development and test for follow-on H-1 Improvements.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy			Date: March 2019
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development	SS/CPFF	BHTI : Amarillo, TX	0.000	0.000		17.051	Jan 2019	15.172	Jan 2020	-		15.172	37.939	70.162	70.162
Systems Engineering	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.685	Nov 2018	1.094	Nov 2019	-		1.094	3.774	5.553	-
		Subtotal	0.000	0.000		17.736		16.266		-		16.266	41.713	75.715	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Software Development	SS/CPFF	BHTI : Amarillo, TX	0.000	0.000		2.493	Feb 2019	2.153	Feb 2020	-		2.153	5.038	9.684	9.684
Software Development	SS/FP	Northrup Grumman : Woodland Hills, CA	0.000	0.000		7.935	Nov 2018	12.999	Nov 2019	-		12.999	32.388	53.322	53.322
Software Development	WR	NAWCWD : China Lake, CA	0.000	0.000		3.566	Nov 2018	5.555	Nov 2019	-		5.555	12.309	21.430	-
		Subtotal	0.000	0.000		13.994		20.707		-		20.707	49.735	84.436	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Operational Test and Evaluation	WR	COMOPTEVFOR : Norfolk, VA	0.000	0.000		1.988	Nov 2018	2.773	Nov 2019	-		2.773	7.295	12.056	-
Development Test and Evaluation	WR	NAWCAD : Patuxent River, MD	0.000	0.000		19.319	Nov 2018	23.872	Nov 2019	-		23.872	79.778	122.969	-
		Subtotal	0.000	0.000		21.307		26.645		-		26.645	87.073	135.025	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy		Date: March 2019
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Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Contractor Engineering Support	Various	Various : Various	0.000	0.000		0.338	Nov 2018	0.314	Nov 2019	-		0.314	1.408	2.060	2.060
Program Management Support	Various	Various : Various	0.000	0.000		0.703	Nov 2018	1.202	Nov 2019	-		1.202	3.523	5.428	-
Travel	WR	NAVAIR : Patuxent River, MD	0.000	0.000		0.242	Oct 2018	0.225	Oct 2019	-		0.225	Continuing	Continuing	Continuing
		Subtotal	0.000	0.000		1.283		1.741		-		1.741	Continuing	Continuing	N/A

	Prior Years	FY 2018 Cost	FY 2018 Award Date	FY 2019 Cost	FY 2019 Award Date	FY 2020 Base Cost	FY 2020 Base Award Date	FY 2020 OCO Cost	FY 2020 OCO Award Date	FY 2020 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		54.320		65.359		-		65.359	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Navy		Date: March 2019
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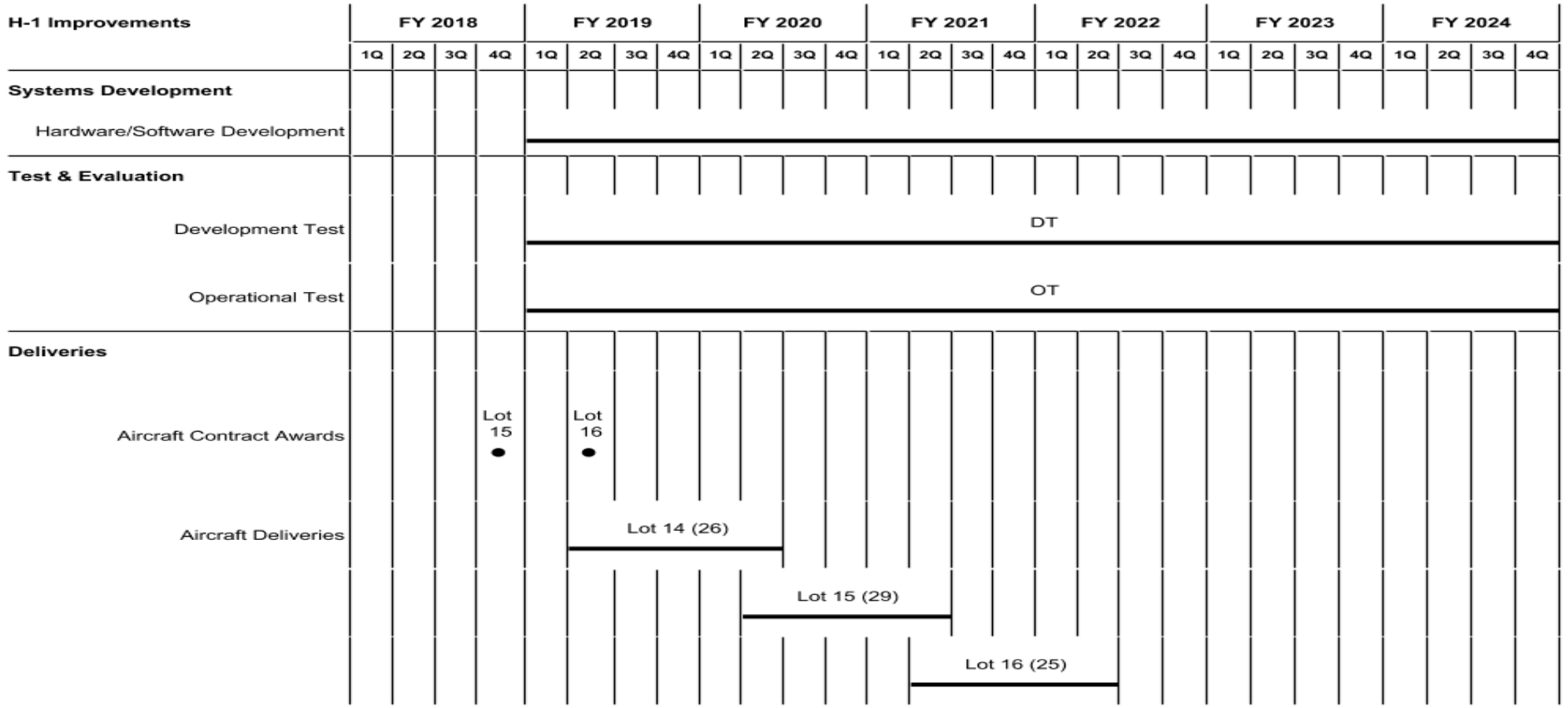

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
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Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
H-1 Improvements				
Systems Development: Hardware/Software Development: Schedule Detail	1	2019	4	2024
Test & Evaluation: Development Test: H-1 Improvements DT	1	2019	4	2024
Test & Evaluation: Operational Test: H-1 Improvements OT	1	2019	4	2024
Deliveries: Aircraft Contract Awards: Lot 15	4	2018	4	2018
Deliveries: Aircraft Contract Awards: Lot 16	2	2019	2	2019
Deliveries: Aircraft Deliveries: Lot 14 FRP Z	2	2019	2	2020
Deliveries: Aircraft Deliveries: Lot 15 FRP Z	2	2020	2	2021
Deliveries: Aircraft Deliveries: Lot 16 FRP Z	2	2021	2	2022