Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy											Date: February 2020	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0604269N *I EA-18 Squadrons*							
COST ($ in Millions)	**Prior Years**	**FY 2019**	**FY 2020**	**FY 2021 Base**	**FY 2021 OCO**	**FY 2021 Total**	**FY 2022**	**FY 2023**	**FY 2024**	**FY 2025**	**Cost To Complete**	**Total Cost**
Total Program Element	2,117.391	235.963	123.637	106.134	-	106.134	74.557	79.709	74.152	75.640	164.215	3,051.398
3063: *EA-18G Development*	2,117.391	143.965	123.637	106.134	-	106.134	74.557	79.709	74.152	75.640	164.215	2,959.400
9999: *Congressional Adds*	0.000	91.998	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	91.998
Program MDAP/MAIS Code: **Project MDAP/MAIS Code(s):** 378												

A. Mission Description and Budget Item Justification

The EA-18G is the primary Airborne Electronic Attack (AEA) platform supporting the Joint Force. The EA-18G is the sole AEA aircraft in the inventory. The EA-18G Growler increases the survivability and lethality of the Joint Force, enabling all-domain access of the Electromagnetic Spectrum (EMS). The centrality of EMS dominance to the CNO's Maritime Strategy further necessitates EA-18G modernization as a strategic pursuit to secure EMS superiority for the Navy's Carrier Strike and Expeditionary operations. Due to the rapid advancements of the adversary's capabilities, the EA-18G, as the DoD's sole source of tactical AEA, will be called upon in future engagements to operate at increased ranges from the threat which far exceed their current capability to effectively deliver kinetic and non-kinetic effects. The Growler Block II upgrade will implement the enabling infrastructure and architecture to facilitate incremental and innovative capability improvements required for Naval Aviation to regain and sustain an advantage in the EMS until the EA-18G replacement. Sensor modernization and sensor fusion are the most critical components of Growler Block II. The onboard sensors of the EA-18G, namely the ALQ-218, require improved sensitivity and processing to detect, ID, and locate, advanced complex threats at longer ranges. ALQ-218 Airborne Electronic Attack Systems Enhancements (ASE) is a combination hardware/software solution to provide this capability. Through processing improvements to the Electronic Attack Unit, the Reactive Electronic Attack Measures (REAM) capability greatly enhances the EA-18G's ability to autonomously process and respond to unknown signals in an extremely dense EMS environment. Capabilities of the EA-18G weapon system and ancillary equipment can be upgraded to accommodate and incorporate new or enhanced weapons as well as advances in technology to respond effectively to emerging future threats. EA-18G "Flight Plan" spiral capability development is critical to the baseline of the EA-18G next generation mission system capability and maintaining tactical relevance in support of Navy Aviation Plan 2030.

Development continues for design and integration of avionics systems, integration of Jamming Techniques Optimization (JATO)improvements, evolutionary software upgrades via the System Configuration Set (SCS) block builds and related testing. Continued advanced development engineering for improvements in reliability and maintainability are required to ensure maximum benefits are achieved through reduced cost of ownership and to provide enhanced availability.

Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy	Date: February 2020
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0604269N *I EA-18 Squadrons*

B. Program Change Summary ($ in Millions)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Previous President's Budget	242.719	143.585	118.535	-	118.535
Current President's Budget	235.963	123.637	106.134	-	106.134
Total Adjustments	-6.756	-19.948	-12.401	-	-12.401
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-19.948			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-6.756	0.000			
• Program Adjustments	0.000	0.000	-13.195	-	-13.195
• Rate/Misc Adjustments	0.000	0.000	0.794	-	0.794

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2019	FY 2020
Project: 9999: *Congressional Adds*		
Congressional Add: *EA-18G Advanced Modes/Cognitive Electronic Warfare Acceleration*	91.998	0.000
Congressional Add Subtotals for Project: 9999	91.998	0.000
Congressional Add Totals for all Projects	91.998	0.000

Change Summary Explanation

The FY 2021 funding request was reduced by $12.401 million to account for the availability of prior year execution balances.

Technical: Not Applicable

Schedule: Schedule was updated to reflect the following changes:
- AEA Growler Block II Development added to schedule
- H22 Software Development completion changed from 2QFY24 to 4QFY24
- H24 Software Development added to schedule
- H20 IT schedule completion changed from 2QFY24 to 4QFY24
- H22 IT added to schedule
- H20 OT added to schedule
- H20 fleet release added to schedule

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604269N / *EA-18 Squadrons*	Project (Number/Name) 3063 / *EA-18G Development*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
3063: *EA-18G Development*	2,117.391	143.965	123.637	106.134	-	106.134	74.557	79.709	74.152	75.640	164.215	2,959.400
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

Project MDAP/MAIS Code: 378

A. Mission Description and Budget Item Justification

The EA-18G development program upgrades the Airborne Electronic Attack (AEA) capability to detect, identify, locate and suppress hostile emitters; provides enhanced connectivity to National, Theater and Strike assets; and provides passive organic precision emitter targeting for employment of precision strike weapons and onboard suppression weapons (High-speed Anti-Radiation Missile family) to fulfill operational requirements. The performance of the aircraft is compatible with the primary strike/ fighter aircraft projected to be in the inventory, allowing it to be fully integrated into specific strike packages.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Title: EA-18G AEA System Enhancements (ASE) and Integrated Capability Package (ICP-3)	118.632	47.065	32.380	0.000	32.380
Articles:	-	-	-	-	-

Description: The EA-18G has the capability to operate autonomously or as a major node in a network-centric operation and is being designed to perform a range of Electronic Warfare/Electronic Attack functions either simultaneously or independently. Funding will be utilized for design and integration of avionics systems into the EA-18G.

FY 2020 Plans:

Continue integration of improvements developed through the Jamming Techniques Optimization (JATO) teams. Work includes increased engineering, flight hours and test efforts for ALQ-218 ASE upgrade requirements to improve low band geo-location, signal detection, and identification capabilities necessary for complex emitter geo-location and identification. Funds will support a combined hardware/software solution to provide significant capability enhancements to the ALQ-218 which are required to address evolving threats. To incorporate those ALQ-218 ASE upgrades with the System Configuration Set (SCS) fleet releases on EA-18G, an increase in engineering, system integration, SCS development, Operational Flight Program re-hosting, test planning, materials, lab equipment, and lab/flight testing are being funded. Funding supports development (hardware and software), test and integration efforts for H16 SCS build such as DTP-N to include Aided Target Recognition, Stationary Target Recognition, Maritime Multiple Target Track and Engagement, Multi-Level Security, Advanced Tactical Data Link; Display Improvements for enhanced sensor integration, Time Difference of Arrival (TDOA), Network Centric Collaborative Targeting (NCCT), and continued updates to Wingman Compatibility improvements.

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604269N / *EA-18 Squadrons*	**Project (Number/Name)** 3063 / *EA-18G Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
FY20 continues funding to support increased ALQ-218 signal processing capacity and capability by adding the Low Band Dedicated Receiver (LBDR) Capability enhancements enable better detection and correct identification of modern radars. Capacity improvements provide increased signal processing in current day dense electromagnetic environments. ***FY 2021 Base Plans:*** Under the H16 plan, and in support for the transition from DT to OT, continue integration of improvements developed through the JATO teams. Work includes increased engineering, flight hours and test efforts for ALQ-218 ASE upgrade requirements to improve low band geo-location, signal detection, and identification capabilities necessary for complex emitter geo-location and identification. Funds will support a combined hardware/software solution to provide significant capability enhancements to the ALQ-218 which are required to address evolving threats. To incorporate those ALQ-218 ASE upgrades with the SCS fleet releases on EA-18G, an increase in engineering, system integration, SCS development, Operational Flight Program re-hosting, test planning, materials, lab equipment, and lab/flight testing are being funded. Funding supports development (hardware and software), test and integration efforts for H16 SCS build such as DTP-N to include Aided Target Recognition, Stationary Target Recognition, Maritime Multiple Target Track and Engagement, Multi-Level Security, Advanced Tactical Data Link; Display Improvements for enhanced sensor integration, Time Difference of Arrival (TDOA), Network Centric Collaborative Targeting (NCCT), and continued updates to Wingman Compatibility improvements. FY21 continues funding to support increased ALQ-218 signal processing capacity and capability by adding the Low Band Dedicated Receiver (LBDR) Capability enhancements enable better detection and correct identification of modern radars. Capacity improvements provide increased signal processing in current day dense electromagnetic environments. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** FY20 to FY21 funding decrease of $14.685 accounts for the reclassification within the PU for efforts involving SCS Design & Integration as well as Growler Block 2/Reactive Electronic Attack Measures (REAM) and Cognitive Electronic Warfare (EW).					
Title: EA-18G Software Development & Integration	13.349	12.380	0.000	0.000	0.000
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604269N / *EA-18 Squadrons*	**Project (Number/Name)** 3063 / *EA-18G Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Description: Continued capability enhancements to improve the EA-18G Airborne Electronic Attack capabilities are predominantly realized through evolutionary software upgrades. Funding will be utilized to develop improved software capabilities for the EA-18G through System Configuration Set block software updates. ***FY 2020 Plans:*** Continue System Configuration Set (SCS) block software development and integration for the EA-18G, specifically SCS builds H16 and H18. Increase to engineering efforts for integration of active and passive kill chain capabilities and sensors. Funding for Multi System Integration algorithm and sensor developmental efforts also increased at test activities for ongoing modeling and simulation upgrades such as Net Enabled Weapon Controller Interface Model interoperability software and equipment, and Live Virtual Constructive interoperability efforts. ***FY 2021 Base Plans:*** Software Development & Integration realigned to SCS Development & Integration beginning in FY21 ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Decrease from FY20 to FY21 of $12.380M accounts for a realignment within the PU for System Configuration Set software builds.					
Title: EA-18G System Configuration Set (SCS) Development & Integration	0.000	0.000	10.495	0.000	10.495
Articles:	-	-	-	-	-
Description: Capability enhancements to improve the EA-18G Airborne Electronic Attack capabilities are predominantly realized through evolutionary software upgrades. Funding will be utilized to develop improved software capabilities for the EA-18G through SCS block software updates. ***FY 2020 Plans:*** N/A ***FY 2021 Base Plans:*** Continue SCS block software development and integration for the EA-18G, specifically SCS builds H18 and H20. Increase to engineering efforts for integration of active and passive kill chain capabilities and sensors. Funding for Multi Source Integration algorithm and sensor developmental efforts also increase for test activities					

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604269N / *EA-18 Squadrons*	**Project (Number/Name)** 3063 / *EA-18G Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
for ongoing modeling and simulation upgrades such as Net Enabled Weapon Controller Interface Model interoperability software and equipment, and Live Virtual Constructive interoperability efforts. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase of $10.495 from FY20 to FY21 results from the reclassification within the PU for System Configuration Set software builds. These efforts were previously captured under Software Development & Integration.					
Title: EA-18G Flight Plan Engineering	2.192	2.028	2.546	0.000	2.546
Articles:	-	-	-	-	-
Description: EA-18G "Flight Plan" spiral capability development is critical to the baseline of the Growler next generation mission system capability. Funding will support the development, test and integration efforts required to maintain tactical relevance in support of Navy Aviation Plan 2030. ***FY 2020 Plans:*** Continue Flight Plan Engineering efforts to include EA-18G improvements necessary for Growler relevance and tactical supremacy; Navy Integrated Fire Control-Counter Air system configuration set requirements to support Navy Integrated Air and Missile Defense capability requirements and enhance EA-18G Cooperative Engagement Capability. ***FY 2021 Base Plans:*** Continue Flight Plan Engineering efforts to include EA-18G improvements necessary for Growler relevance and tactical supremacy; Navy Integrated Fire Control-Counter Air system configuration set requirements to support Navy Integrated Air and Missile Defense capability requirements and enhance EA-18G Cooperative Engagement Capability. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** Increase of $0.518 in funding from FY20 to FY21 results from a slight ramp in Flight Plan T&E activities, to include LBDR and NGJ integration.					
Title: EA-18G Growler Block II	9.792	62.164	60.713	0.000	60.713
Articles:	-	-	-	-	-

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604269N / *EA-18 Squadrons*	**Project (Number/Name)** 3063 / *EA-18G Development*

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
Description: The Growler Block II upgrade will implement the enabling infrastructure and architecture to facilitate incremental and innovative capability improvements required for Naval Aviation to regain and sustain an advantage in the EMS until the EA-18G replacement. Reactive Electronic Attack Measures (REAM) uses cognitive EW machine learning algorithms to provide the warfighter with capabilities to counter advanced dynamic IADS by detecting and identifying unknown adaptive radar emitters. The ONR FNC Electromagnetic Maneuver Warfare Resource Allocation Management (EMW RAM) is software algorithm development for Growler Block II that will implement necessary sensor and jamming resource management. ***FY 2020 Plans:*** N/A ***FY 2021 Base Plans:*** The AEA suite upgrades, to include but not limited to ALQ-218, ALQ-227, and Electronic Attack Unit (EAU), as a part of the Growler Block II upgrade will be progressing through System Engineering Technical Reviews. The Preliminary Design Review and Critical Design Review will include detailed designs and early risk reduction prototype hardware. Integration and test of prototype hardware and software will inform next steps and mature capability enhancements. Obsolescence redesign efforts will continue in order to ensure the infrastructure of the AEA suite remains relevant for automatic, faster processing of data. REAM software development is initiated in H18 SCS build and will continue through integration in H20 SCS build. Advanced sensor demonstrations and risk reduction activities will continue with the VX pod technology growth. EMW RAM program will execute development activities within three primary Technical Areas: EW Battle Management Framework, Advanced EW Adaptive System Management (ASM), and Teaming Interface between Aircrew and Machines. ***FY 2021 OCO Plans:*** N/A ***FY 2020 to FY 2021 Increase/Decrease Statement:*** FY20 to FY21 decrease of $1.451 accounts for a realignment within the Project Unit for efforts involving Growler Block 2, Cognitive EW, and EMW RAM.					
Accomplishments/Planned Programs Subtotals	143.965	123.637	106.134	0.000	106.134

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604269N / *EA-18 Squadrons*	**Project (Number/Name)** 3063 / *EA-18G Development*	

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• APN/0505: *F-18E/F and EA-18G Modernization and Sustainment*	0.000	0.000	468.954	-	468.954	558.476	844.065	847.521	826.835	488,591.834	492,137.685
• RDTEN/1662: *F/A-18 Improvement*	101.694	97.011	130.407	-	130.407	146.912	141.890	139.308	138.082	351.652	5,686.801

Remarks

D. Acquisition Strategy

The program achieved Full Rate Production in November 2009. Studies are underway for Growler Block II capabilities and those efforts will be integrated into the overall EA-18G plan/roadmap as resources permit. EA-18G software upgrades are incrementally developed, integrated and fielded. Software development and integration are coordinated efforts between government activities and industry partners to field capability upgrades to the EA-18G fleet.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604269N / *EA-18 Squadrons*	Project (Number/Name) 3063 / *EA-18G Development*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SCS Software Development & Integration	C/IDIQ	Northrop Grumman : Various	9.923	3.364	Dec 2018	3.431	Dec 2019	3.500	Dec 2020	-		3.500	0.000	20.218	20.218
SCS Software Development & Integration	WR	NAWCWD : China Lake, CA	108.122	1.716	Dec 2018	1.587	Dec 2019	1.000	Dec 2020	-		1.000	0.000	112.425	-
SCS Software Development & Integration	WR	NAWCWD : Pt. Mugu, CA	86.855	2.313	Dec 2018	2.359	Dec 2019	0.857	Dec 2020	-		0.857	0.716	93.100	-
Systems Engineering (Flight Plan)	WR	ONR : Arlington, VA	0.000	0.000		0.000		0.634	Nov 2020	-		0.634	0.734	1.368	-
Systems Engineering (Flight Plan)	Various	Various : Various	1.374	0.588	Dec 2018	0.600	Dec 2019	0.612	Dec 2020	-		0.612	0.000	3.174	-
Primary Hardware Development (Flight Plan - DTP-N)	C/CPFF	Boeing : St. Louis, MO	60.999	10.205	Mar 2019	0.000		0.000		-		0.000	0.000	71.204	71.204
Systems Engineering (Flight Plan - TDOA)	WR	NAWCWD : Various	5.169	1.172	Dec 2018	0.257	Dec 2019	0.366	Dec 2020	-		0.366	0.249	7.213	-
Primary Hardware Development (Flight Plan - TDOA)	C/CPFF	Northrop Grumman : Various	2.959	1.410	Dec 2018	1.438	Dec 2019	1.423	Dec 2020	-		1.423	0.000	7.230	7.230
Systems Engineering (ASE/ICP-3)	WR	NAWCAD : Pax River, MD	36.194	19.618	Dec 2018	6.330	Dec 2019	4.558	Dec 2020	-		4.558	35.485	102.185	-
Systems Engineering (ASE/ICP-3)	Various	Various : Various	7.142	5.139	Dec 2018	4.715	Dec 2019	0.146	Dec 2020	-		0.146	0.000	17.142	-
Primary Hardware Development (ALQ-218 ASE)	C/IDIQ	Northrop Grumman : Various	124.270	34.676	Apr 2019	10.559	Apr 2020	2.940	Apr 2021	-		2.940	0.000	172.445	172.445
Primary Hardware Development (ALQ-218 ASE)	C/CPFF	Boeing : St. Louis, MO	7.521	0.147	Jan 2019	0.150	Jan 2020	0.153	Jan 2021	-		0.153	0.000	7.971	7.971
Systems Engineering (ALQ-218 ASE)	WR	NAWCWD : Pt. Mugu, CA	3.367	4.430	Dec 2018	0.913	Dec 2019	0.861	Dec 2020	-		0.861	0.000	9.571	-
Systems Engineering (ALQ-218 ASE)	WR	NAWCWD : China Lake, CA	1.422	6.079	Dec 2018	1.521	Dec 2019	1.265	Dec 2020	-		1.265	0.000	10.287	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604269N / *EA-18 Squadrons*	Project (Number/Name) 3063 / *EA-18G Development*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Primary Hardware Development (ALQ-218 LBDR)	C/IDIQ	Northrop Grumman : Various	0.000	20.936	Nov 2018	8.607	Dec 2019	7.016	Dec 2020	-		7.016	0.000	36.559	36.559
Systems Engineering (ALQ-218 LBDR)	WR	NAWCWD : Various	1.471	1.429	Dec 2018	0.511	Dec 2019	0.475	Dec 2020	-		0.475	0.000	3.886	-
Systems Engineering (Growler Block 2/REAM)	WR	NAWCAD : Pax River, MD	0.000	0.000		8.861	Nov 2019	12.291	Nov 2020	-		12.291	86.589	107.741	-
Systems Engineering (Growler Block 2/REAM)	WR	NAWCWD : Pt. Mugu, CA	0.000	2.570	Nov 2018	11.482	Nov 2019	13.963	Nov 2020	-		13.963	59.004	87.019	-
Systems Engineering (Growler Block 2/REAM)	WR	NSWC : Crane, IN	0.156	0.000		1.386	Dec 2019	0.920	Dec 2020	-		0.920	6.974	9.436	-
Primary Hardware Development (Growler Block 2/REAM)	Various	NSMA : Various	0.000	0.000		8.800	Feb 2020	11.648	Feb 2021	-		11.648	75.813	96.261	-
Primary Hardware Development (Growler Block 2/REAM)	C/IDIQ	Boeing : Various	0.000	0.000		23.255	Mar 2020	15.480	Mar 2021	-		15.480	76.050	114.785	114.785
Systems Engineering (Growler Block 2/REAM)	Various	Various : Various	0.747	0.000		0.877	Dec 2019	0.895	Dec 2020	-		0.895	7.524	10.043	-
Primary Hardware Development (Growler Block 2/REAM)	C/IDIQ	Northrop Grumman : Various	0.000	7.222	Jun 2019	6.366	Jun 2020	5.514	Jun 2021	-		5.514	3.301	22.403	23.403
Prior Year Prod Dev no longer funded in FYDP	Various	Various : Various	1,104.139	0.000		0.000		0.000		-		0.000	0.000	1,104.139	-
		Subtotal	1,561.830	123.014		104.005		86.517		-		86.517	352.439	2,227.805	N/A

Remarks

Funding increase in FY21 is for Growler Block 2 planned ramp-up of development activities.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604269N / *EA-18 Squadrons*	Project (Number/Name) 3063 / *EA-18G Development*	

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
SCS Development & Integration	Various	NAWCWD : Pt. Mugu	0.000	2.716	Dec 2018	2.170	Dec 2019	2.177	Dec 2020	-		2.177	23.879	30.942	-
SCS Development & Integration Support	C/IDIQ	Northrop Grumman : Various	0.000	1.053	Jan 2019	1.074	Jan 2020	1.096	Jan 2021	-		1.096	12.236	15.459	15.459
SCS Development & Integration Support	WR	NAWCWD : China Lake, CA	0.775	1.059	Dec 2018	1.057	Dec 2019	1.152	Dec 2020	-		1.152	11.745	15.788	-
Flight Plan Engineering	Various	Various : Various	0.000	0.889	Dec 2018	0.857	Dec 2019	0.875	Dec 2020	-		0.875	9.772	12.393	-
ASE/ICP-3 (DTP-N)	WR	NAWCWD : China Lake, CA	5.552	4.010	Dec 2018	1.195	Dec 2019	2.017	Dec 2020	-		2.017	0.000	12.774	-
ASE/ICP-3 (DTP-N)	C/CPFF	Boeing : St. Louis, MO	0.000	0.707	Feb 2019	2.528	Feb 2020	0.999	Feb 2021	-		0.999	0.000	4.234	4.234
ASE/ICP-3 (DTP-N)	WR	SPAWAR : San Diego, CA	0.630	0.040	Dec 2018	1.000	Dec 2019	0.501	Dec 2020	-		0.501	0.000	2.171	-
ASE/ICP-3 (DTP-N)	Various	NSMA : Various	4.827	0.793	Dec 2018	1.001	Dec 2019	1.501	Dec 2020	-		1.501	0.000	8.122	-
Prior Year Support no longer funded in FYDP	Various	Various : Various	235.711	0.000		0.000		0.000		-		0.000	0.000	235.711	-
		Subtotal	247.495	11.267		10.882		10.318		-		10.318	57.632	337.594	N/A

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Flight Plan Integration & Operational Testing	WR	Various : Various	117.725	0.540	Dec 2018	0.101	Dec 2019	0.103	Dec 2020	-		0.103	1.148	119.617	-
ASE/ICP-3 (DTP-N) Integration & Operational Testing	WR	COTF : China Lake, CA	0.600	3.307	Dec 2018	1.598	Dec 2019	6.042	Dec 2020	-		6.042	38.117	49.664	-
ASE/ICP-3 (DTP-N) Integration & Operational Testing	C/IDIQ	Boeing : St. Louis, MO	0.000	1.735	Mar 2019	3.964	Mar 2020	0.409	Mar 2021	-		0.409	0.000	6.108	6.108
ASE/ICP-3 (DTP-N) Integration & Operational Testing	WR	Various : Various	0.000	1.644	Nov 2018	0.749	Nov 2019	0.534	Nov 2020	-		0.534	0.000	2.927	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604269N / *EA-18 Squadrons*	Project (Number/Name) 3063 / *EA-18G Development*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Prior Year T&E no longer funded in FYDP	Various	Various : Various	108.530	0.000		0.000		0.000		-		0.000	0.000	108.530	-
		Subtotal	226.855	7.226		6.412		7.088		-		7.088	39.265	286.846	N/A

Remarks

Funding increase in FY21 for ASE/ICP-3(DTP-N),COTF, is in support of H-16 OT.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ASE/ICP-3 (DTP-N) Program Management Support (Seaport-CSS)	C/CPFF	Wyle Lab : Pax River, MD	15.801	0.653	Apr 2019	0.664	Apr 2020	0.669	Apr 2021	-		0.669	3.010	20.797	20.797
ASE/ICP-3 (DTP-N) Engineering Support	WR	NAWCAD : Pax River, MD	34.027	0.383	Dec 2018	0.383	Dec 2019	0.384	Dec 2020	-		0.384	4.290	39.467	-
Flight Plan Engineering Support	WR	NAWCWD : China Lake	3.340	0.383	Dec 2018	0.383	Dec 2019	0.384	Dec 2020	-		0.384	3.825	8.315	-
Flight Plan Engineering Support	C/CPFF	Boeing : St. Louis, MO	23.813	0.945	Feb 2019	0.814	Feb 2020	0.680	Feb 2021	-		0.680	7.597	33.849	33.849
Travel	WR	Various : Various	2.889	0.094	Dec 2018	0.094	Dec 2019	0.094	Dec 2020	-		0.094	0.215	3.386	-
Prior Year Mgmt Svcs no longer funded in FYDP	Various	Various : Various	1.341	0.000		0.000		0.000		-		0.000	0.000	1.341	-
		Subtotal	81.211	2.458		2.338		2.211		-		2.211	18.937	107.155	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	2,117.391	143.965		123.637		106.134		-		106.134	468.273	2,959.400	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604269N / *EA-18 Squadrons*	**Project (Number/Name)** 3063 / *EA-18G Development*

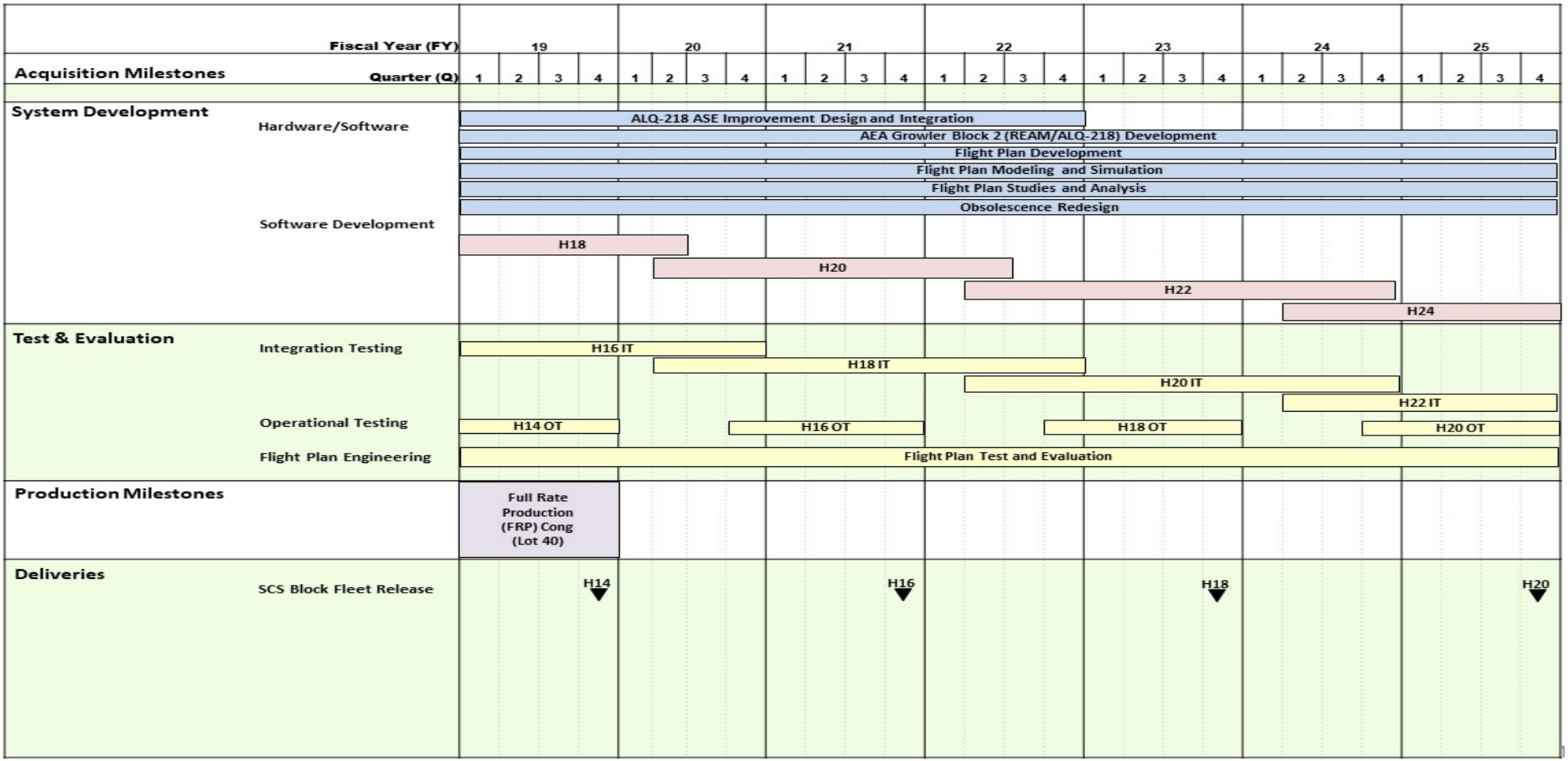

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604269N / *EA-18 Squadrons*	**Project (Number/Name)** 3063 / *EA-18G Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
EA-18G Development				
Systems Development: Hardware/Software: ALQ-218 ASE Improvement Design and Integration	1	2019	4	2022
Systems Development: Hardware/Software: Growler Block 2 AEA Development	1	2019	4	2025
Systems Development: Hardware/Software: Flight Plan Development	1	2019	4	2025
Systems Development: Hardware/Software: Flight Plan Modeling and Simulation	1	2019	4	2025
Systems Development: Hardware/Software: Flight Plan Studies and Analysis	1	2019	4	2025
Systems Development: Hardware/Software: Obsolescence Redesign Development and Testing	1	2019	4	2025
Systems Development: Software Development: H18 Software Development	1	2019	2	2020
Systems Development: Software Development: H20 Software Development	2	2020	2	2022
Systems Development: Software Development: H22 Software Development	2	2022	4	2024
Systems Development: Software Development: H24 Software Development	2	2024	4	2025
Test & Evaluation: Integration Testing: H16 Integration Testing	1	2019	4	2020
Test & Evaluation: Integration Testing: H18 Integration Testing	2	2020	4	2022
Test & Evaluation: Integration Testing: H20 Integration Testing	2	2022	4	2024
Test & Evaluation: Integration Testing: H22 Integration Testing	2	2024	4	2025
Test & Evaluation: Operational Testing: H16 Operational Testing	4	2020	4	2021
Test & Evaluation: Operational Testing: H14 Operational Testing	1	2019	4	2019
Test & Evaluation: Operational Testing: H18 Operational Testing	4	2022	4	2023
Test & Evaluation: Operational Testing: H20 Operational Testing	4	2024	4	2025
Test & Evaluation: Flight Plan Engineering: Developmental, Integration and Operational Testing	1	2019	4	2025
Production Milestones: Full Rate Production - Congressional add Lot 40	1	2019	4	2019

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604269N / *EA-18 Squadrons*	**Project (Number/Name)** 3063 / *EA-18G Development*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Deliveries: SCS Block Fleet Release: H16 Fleet Release	4	2021	4	2021
Deliveries: SCS Block Fleet Release: H18 Fleet Release	4	2023	4	2023
Deliveries: SCS Block Fleet Release: H14 Fleet Release	4	2019	4	2019
Deliveries: SCS Block Fleet Release: H20 Fleet Release	4	2025	4	2025

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604269N / *EA-18 Squadrons*	Project (Number/Name) 9999 / *Congressional Adds*	

COST ($ in Millions)	Prior Years	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
9999: *Congressional Adds*	0.000	91.998	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	91.998
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

FY 19 Congressional Add: EA-18G Advanced Modes/Cognitive Electronic Warfare (EW) Acceleration. Reactive Electronic Attack Measures (REAM) uses cognitive EW machine learning algorithms to provide the warfighter with capabilities to counter advanced dynamic IADS by detecting and identifying unknown adaptive radar emitters. Advanced Modes Phases 1 and 2 are foundational building blocks needed to support REAM via jammer technique management enhancements. REAM autonomously derives effective countermeasures against new, agile, unknown threats, prioritizes threats in a dense EM environment, and dynamically allocates EW resources in one-on-many scenarios. REAM accomplishes this by implementing machine learning logic, automated use of effective EA techniques, and SW/HW upgrades.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2019	FY 2020
Congressional Add: EA-18G Advanced Modes/Cognitive Electronic Warfare Acceleration	91.998	0.000
FY 2019 Accomplishments: FY19 funds EA-18G Advanced Modes/Cognitive EW/REAM risk reduction studies to support hardware development, REAM Electronic Attack Unit (EAU) Software environment, mission planning/ post mission support, REAM Cybersecurity, Cognitive Mission Computing (CMC) Enhancements, as well as threat projection and system impacts.		
FY 2020 Plans: N/A		
Congressional Adds Subtotals	91.998	0.000

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total	FY 2022	FY 2023	FY 2024	FY 2025	Cost To Complete	Total Cost
• 0525: *Advanced Modes/Cognitive EW*	6.830	14.723	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	21.553

Remarks

Funded under OSIP (011-10) under Cost Element 2.2.6 and associated support costs.

D. Acquisition Strategy

Contractual efforts are underway for determination of EA-18G Advanced Modes/Cognitive EW/REAM hardware solutions, risk reduction efforts, and software development. These efforts are coordinated between government activities and industry partners.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604269N / *EA-18 Squadrons*	**Project (Number/Name)** 9999 / *Congressional Adds*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
REAM Growler Block 2 Development	C/IDIQ	Boeing : Various	0.000	38.657	May 2019	0.000		0.000		-		0.000	0.000	38.657	38.657
REAM Growler Block 2 Development	C/CPFF	JHU/APL : Various	0.000	0.750	Feb 2019	0.000		0.000		-		0.000	0.000	0.750	0.750
Systems Engineering (REAM)	Various	NSMA : Various	0.000	32.200	May 2019	0.000		0.000		-		0.000	0.000	32.200	-
Systems Engineering (REAM)	MIPR	Defense Innovation Unit : Various	0.000	3.000	Jun 2019	0.000		0.000		-		0.000	0.000	3.000	-
Systems Engineering (REAM)	C/IDIQ	Boeing : Various	0.000	1.000	Jun 2019	0.000		0.000		-		0.000	0.000	1.000	1.000
Systems Engineering (REAM)	Various	Various : Various	0.000	5.000	Jun 2019	0.000		0.000		-		0.000	0.000	5.000	-
REAM Software Development	C/IDIQ	Northrop Grumman : Various	0.000	3.150	Jun 2019	0.000		0.000		-		0.000	0.000	3.150	3.150
REAM CD-3 Integration	C/IDIQ	Northrop Grumman : Various	0.000	1.154	Jun 2019	0.000		0.000		-		0.000	0.000	1.154	1.154
		Subtotal	0.000	84.911		0.000		0.000		-		0.000	0.000	84.911	N/A

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
REAM Growler Block 2 Support	WR	NAWCWD : China Lake, CA	0.000	3.929	Apr 2019	0.000		0.000		-		0.000	0.000	3.929	-
CD-3 Integration Test & Support	WR	NAWCWD : Pt. Mugu, CA	0.000	0.400	Dec 2018	0.000		0.000		-		0.000	0.000	0.400	-
Engineering & Logistics Support	WR	NSWC : Crane, IN	0.000	1.000	Dec 2018	0.000		0.000		-		0.000	0.000	1.000	-
		Subtotal	0.000	5.329		0.000		0.000		-		0.000	0.000	5.329	N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy			Date: February 2020
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604269N / *EA-18 Squadrons*	Project (Number/Name) 9999 / *Congressional Adds*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2019 Cost	FY 2019 Award Date	FY 2020 Cost	FY 2020 Award Date	FY 2021 Base Cost	FY 2021 Base Award Date	FY 2021 OCO Cost	FY 2021 OCO Award Date	FY 2021 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Integration & Operational Testing (CLATS)	C/CPFF	Dynetics : Various	0.000	1.758	Apr 2019	0.000		0.000		-		0.000	0.000	1.758	1.758
		Subtotal	0.000	1.758		0.000		0.000		-		0.000	0.000	1.758	N/A

	Prior Years	FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	91.998		0.000		0.000		-		0.000	0.000	91.998	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604269N / *EA-18 Squadrons*	**Project (Number/Name)** 9999 / *Congressional Adds*

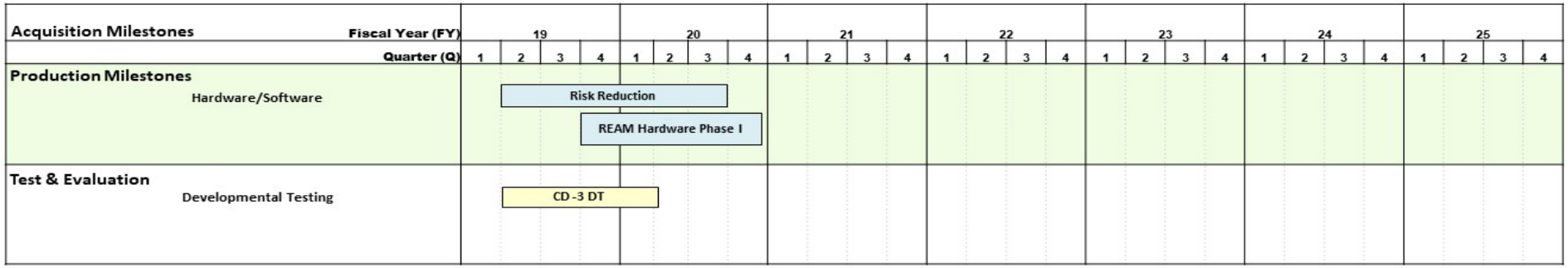

Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0604269N / *EA-18 Squadrons*	**Project (Number/Name)** 9999 / *Congressional Adds*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
EA-18G Advanced Modes/Cognitive Electronic Warfare				
Product Development: Hardware/Software: Risk Reduction	2	2019	3	2020
Product Development: Hardware/Software: REAM Hardware Phase I	4	2019	4	2020
Test and Evaluation: Developmental Testing: Capability Demonstration 3	2	2019	1	2020