

**UNCLASSIFIED**

**Exhibit R-2, RDT&E Budget Item Justification: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319: Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)	<b>R-1 Program Element (Number/Name)</b> PE 0604659N / Precision Strike Weapons Development Program
--	--

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	32.774	89.477	637.254	1,102.387	-	1,102.387	1,419.425	1,286.990	987.606	1,008.475	Continuing	Continuing
3334: Conventional Prompt Strike (CPS)	0.000	10.809	512.226	1,008.375	-	1,008.375	1,305.701	1,197.914	891.424	910.573	Continuing	Continuing
3378: Next Generation Land Attack Weapon (NGLAW)	14.139	3.936	19.722	7.493	-	7.493	56.665	69.097	88.740	90.520	Continuing	Continuing
3407: Air Launched Decoy Development	18.635	74.732	105.306	79.724	-	79.724	49.265	12.285	6.743	6.883	Continuing	Continuing
3409: Advanced Aerial Refueling System	0.000	0.000	0.000	5.995	-	5.995	6.994	6.994	0.000	0.000	0.000	19.983
3411: CAD/PAD Digital Twin Modeling	0.000	0.000	0.000	0.800	-	0.800	0.800	0.700	0.699	0.499	Continuing	Continuing

**Program MDAP/MAIS Code:**  
**Project MDAP/MAIS Code(s):** 570

**Note**

Project 3409, Advanced Aerial Refueling System and Project 3411, CAD/PAD Digital Twin Modeling, are new starts in FY 2021.

**A. Mission Description and Budget Item Justification**

Initial and continuing development of strike weapons consisting of armament, munitions, and weapon subsystems to allow for horizontal integration among current and future weapon system capabilities to provide enhanced anti-surface and land strike capabilities in a demanding Anti-Access Area-Dental environment. This program provides for the development of weapon and weapon system technologies to address future requirements for enhanced and alternative weapon system capability requirements that include selectable output weapons, low collateral damage weapons, precision lethality weapons, area weapons, alternative warhead technology, Insensitive Munitions (IM), scaled munitions, Department of Defense (DoD) fuzing systems, sensors, extended range weapons, precision guided training rounds, aerial refueling, fuel containment, and technologies associated with cartridge actuated devices/propellant actuated devices.

PROJ 3334: The Precision Strike Weapons Development Program Element supports Conventional Prompt Strike (CPS) warfighting capability that enables precise and timely strike capabilities in contested environments across multiple platforms. In coordination with the Army, the Navy CPS Program will design a missile comprised of a common hypersonic glide body (C-HGB) and a 34.5" two-stage booster. Development efforts under this program element leads to a weapon system capability that: (1) is non-ballistic over the majority of the flight path; (2) controls stage drop; (3) provides positive control and precision accuracy from launch to impact; (4) provides adequate cross-range/maneuverability to avoid over-flight issues; (5) provides prompt lethal effects on targets; and (6) is man-safe and deployable for surface and submerged platforms.

**UNCLASSIFIED**

<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy I BA 4: Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0604659N / <i>Precision Strike Weapons Development Program</i>	
<p>PROJ 3378: The Precision Strike Weapons Development Program Element (PE) supports the Next Generation Strike Weapon (NGSW) Family of Systems (FoS) based on the NGLAW Analysis of Alternatives (AoA) completed with results briefed out to OSD. NGSW FoS more accurately reflects the surface/submarine capabilities for land-attack and maritime strike that the AoA results identified for the most capable and economic solutions fielding incrementally between 2020 and 2032. NGSW FoS Increments I and II will leverage mature as well as emerging technologies vice developing a single weapon. NGSW funding will maintain the security environment (enclave), facility, and study team to enable continuing analysis efforts across the FoS. The NGSW enclave ensures the Navy is able to maintain the most up to date modeled threats and validate the effectiveness of current US weapons, offensive and defensive, as well as future systems and concepts developed by industry and other DoD organizations. Maintaining this capability allows expedited analysis of systems and fully informed investment decisions.</p> <p>PROJ 3407: The Precision Strike Weapons Development Program Element (PE) supports the air-launched electronic warfare (EW) systems capability; through the integration of a Navy variant of the Miniature Air Launched Decoy (MALD). EW is an integral war-fighting effect supporting combatant commander integrated priorities, as well as Joint or Coalition operations. EW systems influence, deceive, disrupt, degrade, deny and destroy threats throughout the electromagnetic spectrum to airborne and air-launched systems and their operations. EW includes air-launched electronic attack (EA) as well as elements of electronic support (ES) and electronic protection (EP). EA provides self-protection capabilities to other weapon systems through active and passive measures that deceive threats to airborne and air-launched systems and their operations by using kinetic and non-kinetic means to defeat threats that rely on the electromagnetic spectrum (Radio Frequency (RF), Electro-Optical (EO), Infrared (IR). The ES capabilities support the collection, analysis, and dissemination of information related to the detection, geo-location, characterization, and identification of threats to airborne and air-launched systems and their operations. An air-launched EW system with stand-in capability increases the range and duration of EW systems while providing flexibility to commanders for employment.</p> <p>MALD is integral to realizing the National Defense Strategy of combat-credible military forces to deter war, protect the security of our nation and to enable the Joint Force to win should deterrence fail. The development and acquisition of MALD has been structured to be fielded at a pace relevant to maintain overmatch against long-term strategic competition. Specifically MALD directly contributes to building a more lethal force and is a critical enabler for joint lethality in contested environments; deterring adversaries from aggression and evolves innovative operational concepts.</p> <p>PROJ 3409: The Precision Strike Weapons Development Program Element (PE) supports the Advanced Aerial Refueling Store (AARS) which incorporates new technologies to be the next generation of Aerial Refueling. This variant will increase safety of flight, facilitate unmanned tanker to refuel receiver aircraft, incorporate better health and diagnostics information and improved fail-safe technology. The AARS will increase reliability and decrease serial refueling mishaps.</p> <p>PROJ 3411: The Precision Strike Weapons Development Program Element (PE) supports the Cartridge Actuated Device / Propellant Actuated Device (CAD/PAD) Digital Twin Modeling to develop and validate models and algorithms for the Department of the Navy (DoN). The development effort is specific to Navy Air Crew Common Ejection Seats (NACES). These models will also be used to support initial service life decisions, service life extension decisions, and address obsolescence.</p> <p>JUSTIFICATION FOR BUDGET ACTIVITY: This program is funded under ADVANCED COMPONENT DEVELOPMENT AND PROTOTYPES because it includes all efforts necessary to evaluate integrated technologies, representative models or prototype systems in a high fidelity and realistic operating environment.</p>		

**UNCLASSIFIED**

**Exhibit R-2, RDT&E Budget Item Justification:** PB 2021 Navy **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 4: Advanced Component Development &amp; Prototypes (ACD&amp;P)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0604659N / <i>Precision Strike Weapons Development Program</i>
---	---

<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
Previous President's Budget	91.833	718.148	1,169.920	-	1,169.920
Current President's Budget	89.477	637.254	1,102.387	-	1,102.387
Total Adjustments	-2.356	-80.894	-67.533	-	-67.533
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-80.894			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-2.356	0.000			
• Program Adjustments	0.000	0.000	-71.961	-	-71.961
• Rate/Misc Adjustments	0.000	0.000	4.428	-	4.428

**Change Summary Explanation**

FY 2020: Funding reduced (-\$80.9M) based on Congressional adjustment to Conventional Prompt Strike for 'unexecutable growth.'

FY 2021: Funding reduced (-\$67.5M) due to program adjustments to reflect two new start efforts (+\$6.0M for Proj 3409 and +\$0.8M for Proj 3411); the re-phasing of CPS test schedule (Proj 3334, -\$57.6M); redirection of funds from NGLAW to new production of Tomahawk Land Attack Missile (Proj 3378, -\$7.0M); reduction of funds to Air Launched Decoy Development based on prior year execution balance (Proj 3407, -\$14.2M); and Rate Adjustments for Navy Working Capital Fund (+\$4.4M).

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy										<b>Date:</b> February 2020		
<b>Appropriation/Budget Activity</b> 1319 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0604659N / <i>Precision Strike Weapons Development Program</i>				<b>Project (Number/Name)</b> 3334 / <i>Conventional Prompt Strike (CPS)</i>			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
3334: <i>Conventional Prompt Strike (CPS)</i>	0.000	10.809	512.226	1,008.375	-	1,008.375	1,305.701	1,197.914	891.424	910.573	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

The Conventional Prompt Strike (CPS) Weapon System delivers a hypersonic conventional offensive strike capability through a depressed boost-glide trajectory to prosecute deep-inland, time-critical, soft and medium-hardened targets in contested environments. The Navy CPS weapon system or major elements of the weapon system will be deployed onboard multiple launch platforms. The CPS program is a joint effort between services with design and data sharing. The Navy and Army are collaborating to design and produce the common hypersonic glide body (C-HGB). To enable weapon system integration to Navy mission requirements, near-term design, development, and experimentation will be required for boosters, thermal protection systems, navigation, guidance and control systems, enhancements, payload modules, weapon control systems and interface to existing fire control systems, support equipment, and launcher systems. Component & subsystem technology maturity and risk reduction will be demonstrated through ground-based testing, in-air and underwater launch testing, and flight tests. Furthermore, with each platform deployment, risk continues to be reduced for weapon subsystems and components until prototyping efforts culminate in an initial operational Virginia-Class submarine weapon system capability. The program will capitalize on commonality between platform implementations, enabling other Service operational capabilities.

CPS supports the National Defense Strategy by supporting modernization initiatives for hypersonic technologies and enabling a more lethal force by: (1) Providing rapid delivery of capability through multiple acquisition increments and configurations; and (2) Providing flexibility to allow for additional capability phases as the weapon system and warfighter requirements evolve.

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<b>Title:</b> Conventional Prompt Strike (CPS)	10.809	512.226	1,008.375	0.000	1,008.375
<b>Articles:</b>	-	-	-	-	-
<b>FY 2020 Plans:</b> U) (\$512.226M)					
(U) CPS Weapons System (\$165.130M): -Building off the success of the flight experiment (FE-1) in FY 2018, FE-2 will be conducted in FY 2020. Full scale flight test will demonstrate system performance and validate modeling efforts and ground testing; FE-2 will advance the C-HGB design and aid in technology transition to industry through the demonstration of contested environment capability and an expanded flight envelope.					

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604659N / <i>Precision Strike Weapons Development Program</i>	<b>Project (Number/Name)</b> 3334 / <i>Conventional Prompt Strike (CPS)</i>

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<p>-Leveraging defense-wide research and development funds provided in FY 2019 (PE 0604165D8Z), weapon system development and integration activities include the design, development, and experimentation of hypersonic subsystems including: boosters, thermal protection systems, navigation, guidance and control systems, enhancements, payload modules, weapon control systems (including three agnostic software modules for on-platform mission planning, weapons control, and weapons interface) and interface to existing fire control systems, support equipment, and launcher systems.</p> <p>-Following FE-2, transition from C-HGB Block 0 to C-HGB Block 1 design, build, integrate &amp; test activities.</p> <p>-Design, development, and construction of Underwater Launch Test Facility (ULTF) located at Naval Surface Warfare Center (NSWC) Crane. Testing will be conducted using all-up-round (AUR) analog test vehicles to investigate launch phenomena and to mitigate risks/potential impacts to underwater launch due to advanced payload module (APM), ejector designs, design changes, or ship characteristics. The program will leverage Naval Air Warfare Center Weapons Division (NAWCWD) China Lake as the subject matter expert to facilitate the design and construction of the ULTF.</p> <p>(U) Flight Subsystem (\$282.336M):</p> <p>-Continued missile systems engineering to include missile architecture development through trade studies and model-based analysis; subsystem, component, and test requirements development; systems integration; and verification and test. Includes ongoing design and development of prototype missile body for C-HGB Block 1 and the initiation of prototype missile body for C-HGB Block 2.</p> <p>-Continued efforts for 1st and 2nd stage solid rocket motors including engineering design, development &amp; test, hardware manufacturing, and quality assurance.</p> <p>-Ongoing prototype design &amp; development efforts for Box-Launch capability (including prototype canister), design efforts for Virginia Payload Module (VPM) modification, and design efforts for future deployment platforms.</p> <p>-Identify and acquire initial materials and parts for missile test assets required for Navy FE-3 &amp; Dynamic Booster Test (DBT). This joint flight campaign (JFC-1) will be conducted in FY22 and will demonstrate AUR capability with a new prototype missile body and Block 1 C-HGB.</p> <p>-Initiate In-Air Launcher Testing to refine the technology for cold gas ejection of the missile; initial testing will determine system maturity and readiness for canister launched weapon system level testing.</p>					

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604659N / <i>Precision Strike Weapons Development Program</i>	<b>Project (Number/Name)</b> 3334 / <i>Conventional Prompt Strike (CPS)</i>

<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<p>(U) Platform Integration (\$34.700M):</p> <ul style="list-style-type: none"> <li>-Continue to establish a comprehensive Integration and Test Program that addresses all CPS test activities for component- level, subsystem-level, system-level, interface, integration, environmental, safety, security/cyber, logistics, and flight tests.</li> <li>-Develop an acquisition strategy for integration of the Conventional Prompt Strike Mission Planning capability into the Theater Mission Planning Center. Off-Hull Mission Planning will be developed and tested in coordination with PMA-281, Strike Planning and Execution Systems. For each weapon system capability iteration, at least one flight test will be an end- to-end test including off-hull mission planning.</li> </ul> <p>(U) Advanced Research and Development (\$30.060M):</p> <ul style="list-style-type: none"> <li>- The program will continue to develop, model, and refine CPS architecture designs, including hardware, software, computer software and computer software documentation and operator requirement allocations and support of external system interfaces. Advanced R&amp;D efforts support future spiral capabilities such as enhanced warhead, advanced communication, alternative navigation, and terminal sensor technology.</li> </ul> <p><b>FY 2021 Base Plans:</b></p> <p>(U) (\$1,008.375M)</p> <p>(U) CPS Weapon System (\$322.075M):</p> <ul style="list-style-type: none"> <li>- Continue C-HGB Block 1 efforts in preparation for JFC-1 to be conducted in Q1 FY 2022 and initiate C-HGB Block 2 design and build.</li> <li>-Continue development of an underwater launch test capability to support launch system prototype efforts and evaluation / qualification program at the ULTF.</li> <li>-Conduct an evaluation test readiness review. Test data will be analyzed and evaluated, leveraging the results as part of the design process to drive improvements, reduce risks and gain early insight into performance and reliability. Through continuous integration, test, and stakeholder demonstrations, weapon system capabilities are delivered incrementally. Multiple software demonstrations are planned to obtain feedback from stakeholders and end users to verify operational performance of the weapon system.</li> <li>-Increase efforts for weapon system development and integration activities including the design, development, and experimentation of hypersonic subsystems including: boosters; conventional warheads; thermal protection systems; guidance systems; payload modules; launch systems; fire control systems; and support equipment.</li> </ul>					

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604659N / <i>Precision Strike Weapons Development Program</i>	<b>Project (Number/Name)</b> 3334 / <i>Conventional Prompt Strike (CPS)</i>

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<p>(U) Flight Subsystem (\$369.477M):</p> <ul style="list-style-type: none"> <li>-Continue and increase efforts for missile development and missile body flight articles. This includes the transition to production of prototype C-HGB. FY 2021 missile development activities include identifying and procuring initial materials and parts for missile test assets required for JFC-1. This testing will further enhance the capability of the C-HGB and includes the development and demonstration of the HBTD booster and associated missile body hardware compatible with deployment from submerged platforms.</li> <li>- Continue ongoing prototype design &amp; development efforts for Box-Launch capability (including prototype canister), design efforts for Virginia Payload Module (VPM) modification, and design efforts for future deployment platforms.</li> <li>-Continue full-scale in-air launch testing at The Naval Air Warfare Center Weapons Division (NAWCWD) China Lake. The facility will house a prototype Launcher Test Assembly (LTA) and will utilize instrumentation outfitting on Inert Test Vehicles (ITVs) to demonstrate APM ejector and AUR Capsule functionality and performance, as well as fly out trajectories and loading. FY 2021 in-air launcher testing activities include demonstrating platform integration of AUR Canister, advanced payload module (APM), and Weapon Control System capabilities.</li> </ul> <p>(U) Platform Integration (\$289.041M):</p> <ul style="list-style-type: none"> <li>-Continue to establish a comprehensive Integration and Test Program that addresses all CPS test activities for component- level, subsystem-level, system-level, interface, integration, environmental, safety, security/cyber, logistics, and flight tests.</li> <li>-Continue development of mission planning capability.</li> <li>-Commence initial development of SSGN Operational Alteration (OP-Alt). Integration of CPS on SSGNs is a multi-year effort that provides an opportunity for CPS payload testing while also supporting future CPS integration on VPM-equipped SSNs. In FY 2021, OP-Alt development will provide a CPS configuration for limited operational capability (LOC) which will include a launcher capability as well as weapon control, combat control, and information system modifications.</li> </ul> <p>(U) Advanced Research and Development (\$27.782M):</p> <ul style="list-style-type: none"> <li>- Continue to develop, model, and refine CPS architecture designs, including hardware, software, computer software and computer software documentation and operator requirement allocations and support of external</li> </ul>					

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604659N / <i>Precision Strike Weapons Development Program</i>	<b>Project (Number/Name)</b> 3334 / <i>Conventional Prompt Strike (CPS)</i>

<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<p>system interfaces. Advanced R&amp;D efforts support future spiral capabilities such as enhanced warhead, advanced communication, alternative navigation, and terminal sensor technology.</p> <p><b>FY 2021 OCO Plans:</b> N/A</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The FY 2020 to FY 2021 program increase of \$496.149M provides for platform integration and development efforts, procurement of prototype C-HGBs, the increased development and procurement of missiles/missile body flight articles, conducting in-air launch testing, as well as increased effort associated with the design, development, and experimentation of hypersonic subsystems including: boosters, thermal protection systems, navigation, guidance and control systems, enhancements, payload modules, weapon control systems and interface to existing fire control systems, support equipment, and launcher systems.</p>					
<b>Accomplishments/Planned Programs Subtotals</b>	10.809	512.226	1,008.375	0.000	1,008.375

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

N/A

**Remarks**

**D. Acquisition Strategy**

CPS will utilize a Middle Tier Acquisition approach per Section 804 of the Fiscal Year (FY) 2016 National Defense Authorization Act (NDAA), as amended in FY 2017 NDAA (codified at 10 U.S.C. sub sec 2302 note) to deliver CPS capability to the Navy across multiple platforms. The CPS program is designed for flexibility to allow the program Acquisition Decision Authority to establish additional capability phases as the weapon system and warfighter requirements evolve.

**UNCLASSIFIED**

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy												Date: February 2020			
Appropriation/Budget Activity 1319 / 4				R-1 Program Element (Number/Name) PE 0604659N / Precision Strike Weapons Development Program					Project (Number/Name) 3334 / Conventional Prompt Strike (CPS)						
Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Conventional Prompt Strike Weapon System	SS/CPFF	Lockheed Martin Corporation : Sunnyvale, CA	0.000	0.000		1.760	Oct 2019	199.269	Oct 2020	-		199.269	Continuing	Continuing	Continuing
Conventional Prompt Strike Weapon System	WR	Naval Air Weapons Station : China Lake, CA	0.000	0.000		84.520	Nov 2019	39.626	Oct 2020	-		39.626	Continuing	Continuing	Continuing
Conventional Prompt Strike Weapon System	MIPR	United States Army : Various	0.000	0.000		26.940	Feb 2020	34.000	Oct 2020	-		34.000	Continuing	Continuing	Continuing
Conventional Prompt Strike Weapon System	Various	Various : Various	0.000	1.759	Sep 2019	12.880	Dec 2019	16.720	Oct 2020	-		16.720	Continuing	Continuing	Continuing
Conventional Prompt Strike Weapon System	SS/CPFF	Johns Hopkins Univ. Applied Physics Lab : Baltimore, MD	0.000	0.000		16.490	Feb 2020	15.592	Oct 2020	-		15.592	Continuing	Continuing	Continuing
Conventional Prompt Strike Weapon System	WR	Naval Surface Warfare Center Crane : Crane, IN	0.000	0.000		18.800	Nov 2019	9.679	Oct 2020	-		9.679	Continuing	Continuing	Continuing
Conventional Prompt Strike Weapon System	C/CPFF	Systems Planning & Analysis : Alexandria, VA	0.000	0.000		2.700	Dec 2019	6.189	Oct 2020	-		6.189	Continuing	Continuing	Continuing
Conventional Prompt Strike Weapon System	MIPR	Missile and Space Intelligence Center : Huntsville, AL	0.000	0.000		1.040	Feb 2020	1.000	Oct 2020	-		1.000	Continuing	Continuing	Continuing
Conventional Prompt Strike Weapon System	MIPR	Lawrence Livermore National Laboratory : Livermore, CA	0.000	4.610	Apr 2019	0.000		0.000		-		0.000	0.000	4.610	-
Flight Subsystem	SS/CPFF	Lockheed Martin Corporation : Sunnyvale, CA	0.000	0.000		171.590	Oct 2019	169.456	Oct 2020	-		169.456	Continuing	Continuing	Continuing
Flight Subsystem	MIPR	Sandia National Laboratory : Albuquerque, NM	0.000	0.000		41.006	Feb 2020	90.652	Oct 2020	-		90.652	Continuing	Continuing	Continuing
Flight Subsystem	MIPR	United States Army : Various	0.000	0.000		27.500	Feb 2020	62.500	Oct 2020	-		62.500	Continuing	Continuing	Continuing

**UNCLASSIFIED**

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy												Date: February 2020			
Appropriation/Budget Activity 1319 / 4				R-1 Program Element (Number/Name) PE 0604659N / Precision Strike Weapons Development Program						Project (Number/Name) 3334 / Conventional Prompt Strike (CPS)					
Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Flight Subsystem	WR	Naval Surface Warfare Center : Crane, IN	0.000	0.000		10.670	Dec 2019	19.980	Oct 2020	-		19.980	Continuing	Continuing	Continuing
Flight Subsystem	C/CPFF	Dynetics : Huntsville, AL	0.000	0.000		15.850	Feb 2020	15.444	Oct 2020	-		15.444	Continuing	Continuing	Continuing
Flight Subsystem	SS/CPFF	Draper : Boston, MA	0.000	0.000		8.290	Feb 2020	8.000	Oct 2020	-		8.000	Continuing	Continuing	Continuing
Flight Subsystem	Various	Various : Various	0.000	0.000		4.930	Dec 2019	3.445	Oct 2020	-		3.445	Continuing	Continuing	Continuing
Platform Subsystem	SS/CPFF	General Dynamics Electric Boat : Groton, CT	0.000	1.870	Apr 2019	21.760	Dec 2019	175.000	Oct 2020	-		175.000	Continuing	Continuing	Continuing
Platform Subsystem	SS/CPFF	Lockheed Martin Corporation : Sunnyvale, CA	0.000	0.000		8.280	Oct 2019	105.703	Oct 2020	-		105.703	Continuing	Continuing	Continuing
Platform Subsystem	SS/CPFF	Johns Hopkins Univ. Applied Physics Lab : Baltimore, MD	0.000	0.000		2.590	Feb 2020	2.810	Oct 2020	-		2.810	Continuing	Continuing	Continuing
Platform Subsystem	WR	Naval Undersea Warfare Division : Newport, RI	0.000	0.000		2.500	Oct 2019	5.000	Oct 2020	-		5.000	Continuing	Continuing	Continuing
Platform Subsystem	WR	Naval Surface Warfare Center : Dahlgren, VA	0.000	0.000		2.070	Oct 2019	0.528	Oct 2020	-		0.528	Continuing	Continuing	Continuing
Advanced Research and Development	MIPR	Lawrence Livermore National Laboratory : Livermore, CA	0.000	2.570	Apr 2019	13.470	Dec 2019	10.457	Oct 2020	-		10.457	Continuing	Continuing	Continuing
Advanced Research and Development	MIPR	Sandia National Laboratory : Albuquerque, NM	0.000	0.000		6.220	Feb 2020	8.714	Oct 2020	-		8.714	Continuing	Continuing	Continuing
Advanced Research and Development	SS/CPFF	Draper : Boston, MD	0.000	0.000		9.330	Feb 2020	6.448	Oct 2020	-		6.448	Continuing	Continuing	Continuing
Advanced Research and Development	SS/CPFF	Johns Hopkins Univ. Applied Physics Lab : Baltimore, MD	0.000	0.000		1.040	Feb 2020	2.163	Oct 2020	-		2.163	Continuing	Continuing	Continuing

**UNCLASSIFIED**

<b>Exhibit R-3, RDT&amp;E Project Cost Analysis: PB 2021 Navy</b>											<b>Date:</b> February 2020				
<b>Appropriation/Budget Activity</b> 1319 / 4				<b>R-1 Program Element (Number/Name)</b> PE 0604659N / <i>Precision Strike Weapons Development Program</i>				<b>Project (Number/Name)</b> 3334 / <i>Conventional Prompt Strike (CPS)</i>							
<b>Product Development (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Subtotal</b>			0.000	10.809		512.226		1,008.375		-		1,008.375	Continuing	Continuing	N/A
			<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>	
<b>Project Cost Totals</b>			0.000	10.809		512.226		1,008.375		-	1,008.375	Continuing	Continuing	N/A	

**Remarks**  
Additional details on CPS efforts held at a higher classification.

**UNCLASSIFIED**

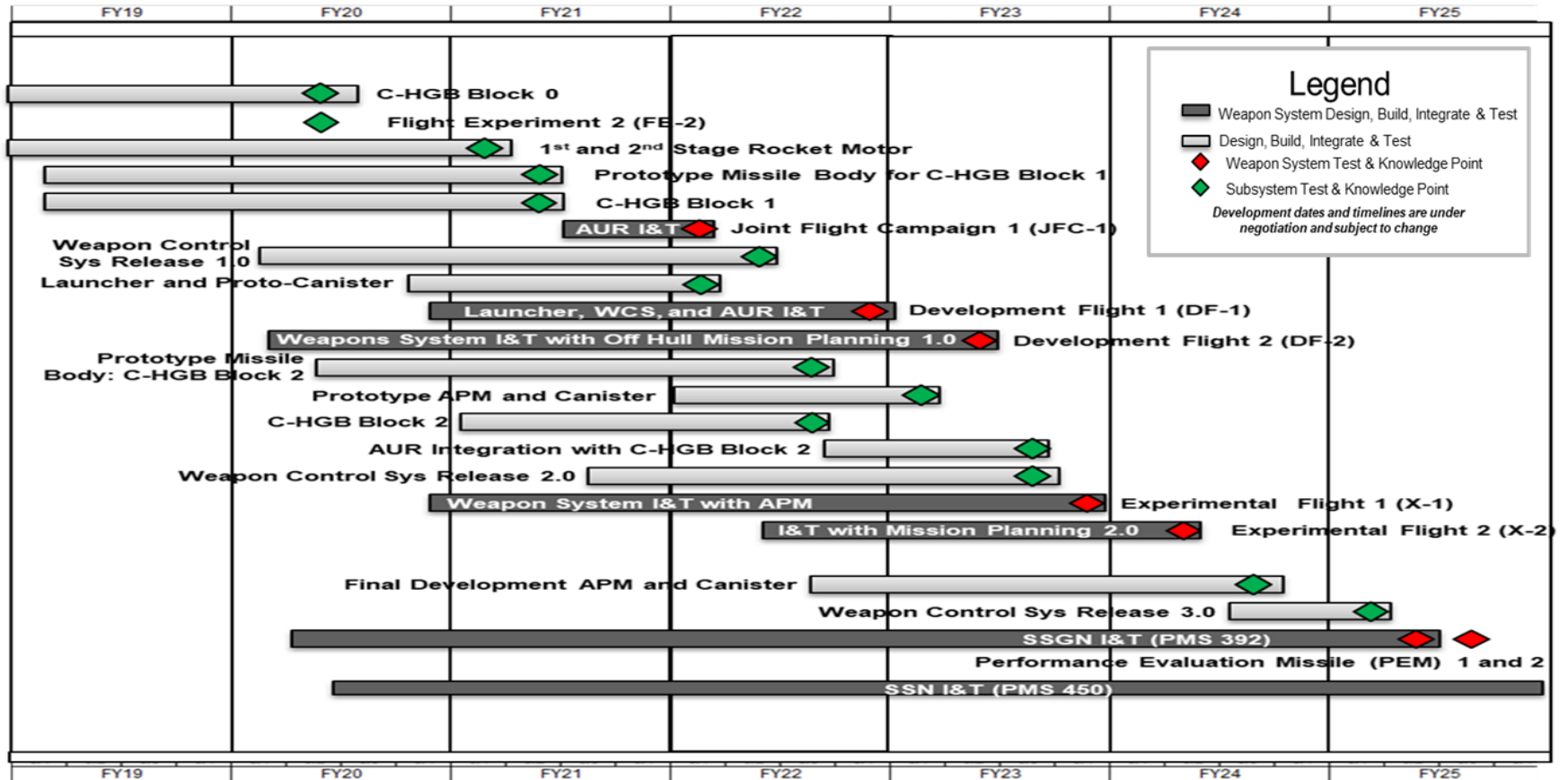
Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy

Date: February 2020

Appropriation/Budget Activity  
1319 / 4

R-1 Program Element (Number/Name)  
PE 0604659N / Precision Strike Weapons  
Development Program

Project (Number/Name)  
3334 / Conventional Prompt Strike (CPS)



**UNCLASSIFIED**

<b>Exhibit R-4A, RDT&amp;E Schedule Details: PB 2021 Navy</b>		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604659N / <i>Precision Strike Weapons Development Program</i>	<b>Project (Number/Name)</b> 3334 / <i>Conventional Prompt Strike (CPS)</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>Proj 3334</b>				
Project 3334: C-HGB Block 0	1	2019	2	2020
Project 3334: FE-2	2	2020	2	2020
Project 3334: 1st and 2nd Stage Rocket Motor	2	2019	2	2021
Project 3334: Prototype Missile Body for C-HGB Block 1	2	2019	2	2021
Project 3334: AUR I&T	3	2021	1	2022
Project 3334: Weapon Control System Release 1.0	2	2020	2	2022
Project 3334: Launcher & Prototype Canister	2	2020	1	2022
Project 3334: Launcher, WCS, and AUR I&T	3	2020	4	2022
Project 3334: Weapon System I&T w/ Off Hull Mission Planning 1.0	2	2020	2	2023
Project 3334: Prototype Missile Body: C-HGB Block 2	2	2020	3	2022
Project 3334: Prototype APM & Canister	1	2022	2	2023
Project 3334: C-HGB Block 2	1	2021	2	2022
Project 3334: All Up Round Integration. w/ C-HGB Block 2	3	2022	3	2023
Project 3334: Weapon Control System Release 2.0	2	2021	3	2023
Project 3334: Weapon System Integration and Test w/ Advanced Payload Module	3	2020	1	2024
Project 3334: Integration and Test w/ Mission Planning	3	2022	2	2024
Project 3334: Final Development of Advanced Payload Module & Canister	3	2022	2	2024
Project 3334: Weapon Control System Release 3.0	3	2024	1	2025
Project 3334: SSGN Integration and Test	2	2020	2	2025
Project 3334: SSN Integration and Test	3	2020	4	2025

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy										<b>Date:</b> February 2020		
<b>Appropriation/Budget Activity</b> 1319 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0604659N / <i>Precision Strike Weapons Development Program</i>				<b>Project (Number/Name)</b> 3378 / <i>Next Generation Land Attack Weapon (NGLAW)</i>			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
3378: <i>Next Generation Land Attack Weapon (NGLAW)</i>	14.139	3.936	19.722	7.493	-	7.493	56.665	69.097	88.740	90.520	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		
<b>Project MDAP/MAIS Code:</b> 570												

**A. Mission Description and Budget Item Justification**

Funding is provided for the Next Generation Strike Weapon (NGSW) Family of Systems (FoS) based on the NGLAW Analysis of Alternatives (AoA) completed with results briefed out to OSD. NGSW FoS more accurately reflects the surface/submarine capabilities for land-attack and maritime strike that the AoA results identified for the most capable and economic solutions fielding incrementally between 2020 and 2032. NGSW FoS Increments I and II will leverage mature as well as emerging technologies vice developing a single weapon. NGSW funding will maintain the security environment (enclave), facility, and study team to enable continuing analysis efforts across the FoS. The NGSW enclave ensures the Navy is able to maintain the most up to date modeled threats and validate the effectiveness of current US weapons, offensive and defensive, as well as future systems and concepts developed by industry and other DoD organizations. Maintaining this capability allows expedited analysis of systems and fully informed investment decisions. Further funding supports investment for technologies which enable Increment II capabilities (additional details are held at a higher classification).

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<b>Title:</b> Next Generation Land Attack Weapon (NGLAW)	3.936	19.722	7.493	0.000	7.493
<b>Articles:</b>	-	-	-	-	-
<b>FY 2020 Plans:</b> Continue annual enclave security and IT updates, annual DSS updates for latest threat data and ownership defense, multi-domain assessment, expanding the US capabilities database, mission integration, and lifecycle cost estimate updates as applicable. In support of NGSW FoS and continued Offensive Anti-Surface Warfare (OASUW) analysis, modify Tactical Situations (TACSITs) and threat postures for air and surface/subsurface launched weapons, identify new launch points and concepts for employment, mission integration and cost estimate updates as applicable. Begin an Analysis of Alternatives study in support of Nuclear Missile Sea Launched Cruise Missile (SLCM-N). Conduct an Analysis of Alternatives study in support of OASUW to support Increment II development.					
To support Increment II development, funding will be allocated for technologies to enable capabilities identified in the NGLAW AoA for integration in future systems. Additional details are held at a higher classification.					
<b>FY 2021 Base Plans:</b>					

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604659N / <i>Precision Strike Weapons Development Program</i>	<b>Project (Number/Name)</b> 3378 / <i>Next Generation Land Attack Weapon (NGLAW)</i>

<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<p>Continue annual enclave security and IT updates, annual DSS updates for latest threat data and ownership defense, multi-domain assessment, expanding the US capabilities database, mission integration, and lifecycle cost estimate updates as applicable. In support of NGSW FoS and continued Offensive Anti-Surface Warfare (OASUW) analysis, continue to modify TACSITs and threat postures for air and surface/subsurface launched weapons, identify new launch points and concepts for employment, mission integration and cost estimate updates as applicable. Conduct Threat Updates and Threat Modeling in FY2021 to include threat systems against US offensive and defensive systems to ensure the enclave remains fully informed to assist senior leadership in investment decisions. Continue Analysis of Alternatives study in support of Nuclear Missile Sea Launched Cruise Missile (SLCM-N).</p> <p>To support Increment II development, continued funding will be allocated for technologies to enable capabilities identified in the NGLAW AoA for integration in future systems. Additional details are held at a higher classification.</p> <p><b>FY 2021 OCO Plans:</b> N/A</p> <p><b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> FY2020 to FY2021 decrease of \$12.229M is due to completion of OASUW AOA and decreased SLCM-N AoA efforts.</p>					
<b>Accomplishments/Planned Programs Subtotals</b>	3.936	19.722	7.493	0.000	7.493

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

N/A

**Remarks**

**D. Acquisition Strategy**

NGSW FoS more accurately reflects the multi-domain capabilities for land-attack and maritime strike that the NGLAW AoA results identified for the most capable and economic solutions fielding incrementally between 2020 and 2032. NGSW FoS Increments I and II will leverage mature as well as emerging technologies vice developing a single weapon. NGSW funding will maintain the security environment (enclave), facility, and study team to enable continuing analysis efforts across the FoS. The NGSW enclave ensures the Navy is able to maintain the most up to date modeled threats and validate the effectiveness of current US weapons, offensive and defensive, as well as future systems and concepts developed by industry and other DoD organizations. Maintaining the enclave allows expedited analysis of systems and fully informed investment decisions.

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604659N / <i>Precision Strike Weapons Development Program</i>	<b>Project (Number/Name)</b> 3378 / <i>Next Generation Land Attack Weapon (NGLAW)</i>

The SLCM-N recently completed the Navy R3B process and will shortly enter the Knowledge Management and Decision Support System (KMDS) for Joint Staff validation. OSD CAPE is refining their AoA guidance, but will likely direct Navy to investigate options derived from the NGLAW AoA and derivatives. Once approved and received, Navy will begin the AoA.

NGSW FoS funding will support Increment II development of technologies to enable capabilities identified in the NGLAW AoA for integration in future systems. Additional details are held at a higher classification.

**UNCLASSIFIED**

**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604659N / <i>Precision Strike Weapons Development Program</i>	<b>Project (Number/Name)</b> 3378 / <i>Next Generation Land Attack Weapon (NGLAW)</i>
--	---	--

<b>Product Development (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>			
INC II Technologies	C/CPFF	TBD : TBD	0.000	0.000		12.300	Mar 2020	2.028	Mar 2021	-		2.028	Continuing	Continuing	Continuing
<b>Subtotal</b>			0.000	0.000		12.300		2.028		-		2.028	Continuing	Continuing	N/A

**Remarks**  
Development of technologies/components to support NGSW Increment II capabilities for integration in future systems. Additional details are held at a higher classification.

<b>Support (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>			
Development Support	WR	NAWC-WD : China Lake, CA	2.475	0.000		0.112	Dec 2019	0.082	Dec 2020	-		0.082	Continuing	Continuing	Continuing
Development Support- AIR 4.0M	WR	NAWC-AD : Patuxent River, MD	3.114	0.000		0.440	Nov 2019	0.323	Nov 2020	-		0.323	Continuing	Continuing	Continuing
Development Support	SS/CPFF	JHU/APL : Laurel, MD	3.568	1.986	Feb 2019	1.210	Dec 2019	0.900	Dec 2020	-		0.900	Continuing	Continuing	Continuing
Weapons Control System	WR	NSWC-DD : Dahlgren, VA	0.050	0.000		0.275	Dec 2019	0.202	Dec 2020	-		0.202	0.000	0.527	Continuing
Development Support	WR	NSMA : JBAB, DC	4.313	1.950	Feb 2019	5.018	Nov 2019	3.682	Nov 2020	-		3.682	0.000	14.963	Continuing
Development Support	MIPR	NRO : Chantilly, VA	0.569	0.000		0.165	Jan 2020	0.121	Jan 2021	-		0.121	0.000	0.855	Continuing
Development Support	WR	NSWC-NPT : Newport, RI	0.050	0.000		0.180	Dec 2019	0.132	Dec 2020	-		0.132	0.000	0.362	Continuing
<b>Subtotal</b>			14.139	3.936		7.400		5.442		-		5.442	Continuing	Continuing	N/A

**Remarks**  
Annual enclave updates, annual DSS updates, multi-domain assessment, mission integration, support OASUW analysis, conduct SLCM-N AoA study.

**UNCLASSIFIED**

<b>Exhibit R-3, RDT&amp;E Project Cost Analysis: PB 2021 Navy</b>												<b>Date: February 2020</b>			
<b>Appropriation/Budget Activity</b> 1319 / 4				<b>R-1 Program Element (Number/Name)</b> PE 0604659N / <i>Precision Strike Weapons Development Program</i>				<b>Project (Number/Name)</b> 3378 / <i>Next Generation Land Attack Weapon (NGLAW)</i>							
<b>Management Services (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
Management Support	WR	NAWC-AD : Patuxent River, MD	0.000	0.000		0.022	Nov 2019	0.023	Nov 2020	-		0.023	Continuing	Continuing	Continuing
<b>Subtotal</b>			0.000	0.000		0.022		0.023		-		0.023	Continuing	Continuing	N/A
			<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>	
<b>Project Cost Totals</b>			14.139	3.936	19.722		7.493		-		7.493	Continuing	Continuing	N/A	
<b>Remarks</b>															

**UNCLASSIFIED**

**Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604659N / <i>Precision Strike Weapons Development Program</i>	<b>Project (Number/Name)</b> 3378 / <i>Next Generation Land Attack Weapon (NGLAW)</i>
--	---	--

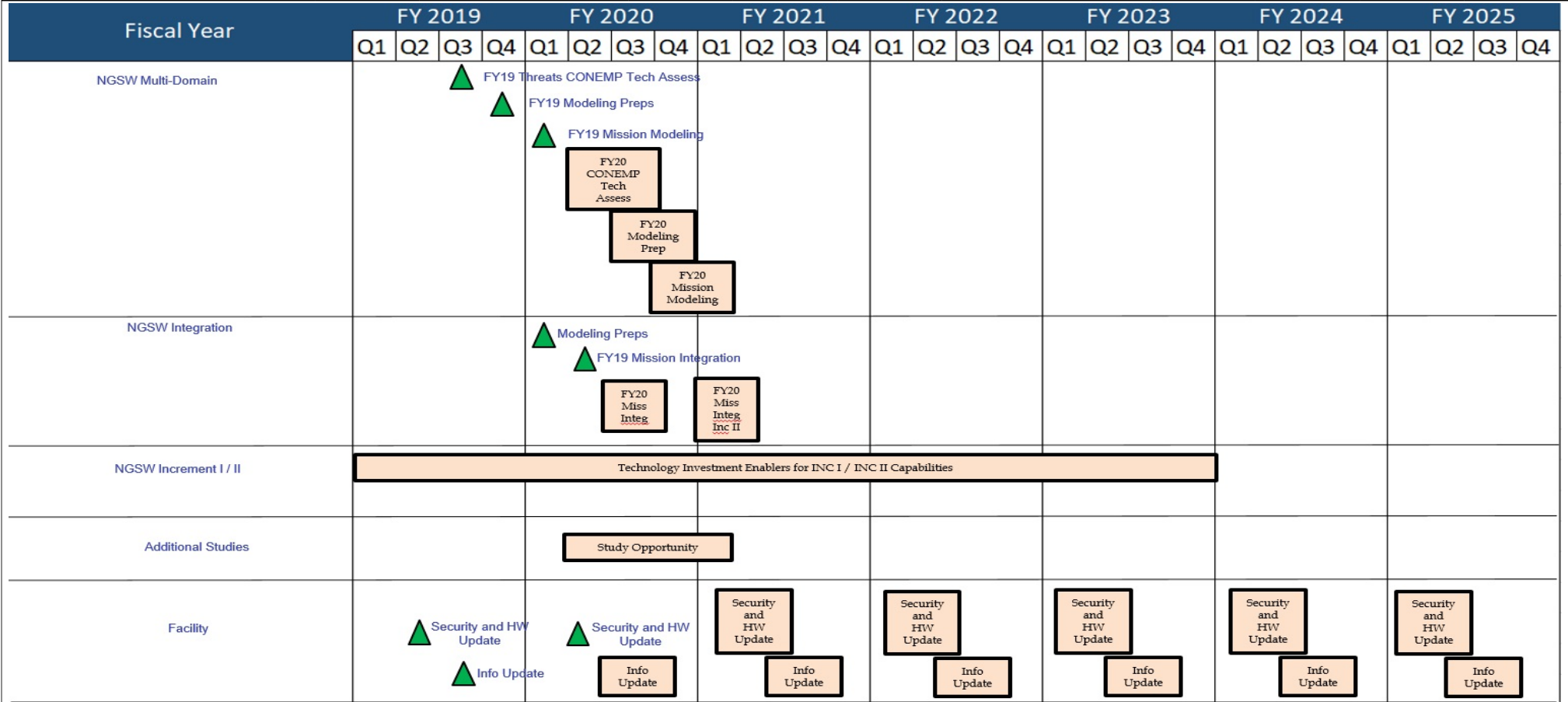
Fiscal Year	FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024				FY 2025							
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
CODE Study		▲			Code Study: Mission Modeling																											
NGSW Target Prioritization		▲			NGSW Target Prioritization: Prep and Mission Integration																											
Upper Cut		▲				▲			Upper Cut: Tech and Prep Cost																							
							▲		Upper Cut: Mission Modeling																							
SLCM-N							▲		SLCM-N: Data Collection and Study Plan (Part of SLCM-N AoA Study)																							
							▲		SLCM-N: CONEMP Threats (Part of SLCM-N AoA Study)																							
							▲		SLCM-N: Tech Assess Cost Preps (Part of SLCM-N AoA Study)																							
							▲		SLCM-N: Trade Space Analysis (Part of SLCM-N AoA Study)																							
									SLCM-N Analysis of Alternatives																							
OASuW		▲			OASuW: CONEMP Threat																											
			▲		OASuW: Tech Assess Modeling Preps																											
				▲	OASuW: Mission Modeling																											
OASuW Integration				▲	OASuW: Mission Integration Preps																											
				▲	OASuW: Mission Integration																											
NGSW New Concepts			▲		NGSW: New Concepts: CONEMP																											
			▲		NGSW: New Concepts: Tech Assess/Modeling Prep																											
			▲		NGSW: New Concepts: Mission Modeling/Int																											
NGSW Threat Update		▲			NGSW: Threats Update: IC Discussions																											
			▲		NGSW: Threats Update: IC Inputs																											
									FY20 Threat Update				FY21 Threat Update				FY22 Threat Update				FY23 Threat Update				FY24 Threat Update				FY25 Threat Update			
					Mission Modeling																											
					Modeling Updates																											

▲	Completed Event	<b>Legend</b>	★	Milestone
□	Scheduled Event			

**UNCLASSIFIED**

**Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604659N / <i>Precision Strike Weapons Development Program</i>	<b>Project (Number/Name)</b> 3378 / <i>Next Generation Land Attack Weapon (NGLAW)</i>
--	---	--



▲	Completed Event	<b>Legend</b>	★	Milestone
■	Scheduled Event			

**UNCLASSIFIED**

<b>Exhibit R-4A, RDT&amp;E Schedule Details: PB 2021 Navy</b>		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604659N / <i>Precision Strike Weapons Development Program</i>	<b>Project (Number/Name)</b> 3378 / <i>Next Generation Land Attack Weapon (NGLAW)</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>Next Generation Strike Weapon</b>				
Code Study: Mission and Code Study Mission Modeling	2	2019	2	2019
NGSW Target Prioritization: NGSW Target Prioritization Prep and Mission Integration	2	2019	2	2019
Upper Cut: Upper Cut Tech and Prep Cost	2	2019	2	2019
Upper Cut: Upper Cut Mission Modeling	3	2019	3	2019
SLCM-N: SLCM-N CNA Data Collection and Study Plan	4	2019	4	2019
SLCM-N: SLCM-N CNA CONEMP Threats	1	2020	1	2020
SLCM-N: SLCM-N CNA Tech Assess Cost Preps	1	2020	1	2020
SLCM-N: SLCM-N Trade Space Analysis	2	2020	2	2020
SLCM-N: SLCM-N Analysis of Alternatives	1	2020	3	2021
OASuW: OASuW CONEMP Threat	2	2019	2	2019
OASuW: OASuW Tech Assessment Modeling Preparations	3	2019	3	2019
OASuW: OASuW Mission Modeling	1	2020	1	2020
OASuW: OASuW Integration: OASuW Integration Mission Integration Preps	4	2019	4	2019
OASuW: OASuW Integration: OASuW Integration Mission Integration	1	2020	1	2020
NGSW New Concepts: NGSW New Concepts CONEMP	3	2019	3	2019
NGSW New Concepts: NGSW New Concepts Tech Assess Modeling Prep	4	2019	4	2019
NGSW New Concepts: NGSW New Concepts Mission Modeling Mission Int	1	2020	1	2020
NGSW Threat Updates: NGSW Threat Updates IC Discussions	2	2019	2	2019
NGSW Threat Updates: NGSW Threat Updates IC Inputs	3	2019	3	2019
NGSW Threat Updates: NGSW FY20 Threat Update	2	2020	4	2020
NGSW Threat Updates: NGSW FY21 Threat Update	1	2021	4	2021

**UNCLASSIFIED**

**Exhibit R-4A, RDT&E Schedule Details: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604659N / <i>Precision Strike Weapons Development Program</i>	<b>Project (Number/Name)</b> 3378 / <i>Next Generation Land Attack Weapon (NGLAW)</i>
--	---	--

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
NGSW Threat Updates: NGSW FY22 Threat Update	1	2022	4	2022
NGSW Threat Updates: NGSW FY23 Threat Update	1	2023	4	2023
NGSW Threat Updates: NGSW FY24 Threat Update	1	2024	4	2024
NGSW Threat Updates: NGSW FY25 Threat Update	1	2025	4	2025
NGSW Threat Updates: NGSW Threat Updates Modeling Updates	4	2019	4	2025
NGSW Threat Updates: NGSW Threat Updates Mission Modeling	1	2020	4	2025
NGSW Multi-Domain: NGSW Multi-Domain FY19 Threats CONEMP Tech Assessment	3	2019	3	2019
NGSW Multi-Domain: NGSW Multi-Domain FY19 Modeling Preparations	4	2019	4	2019
NGSW Multi-Domain: NGSW Multi-Domain FY19 Mission Modeling	1	2020	1	2020
NGSW Multi-Domain: NGSW Multi-Domain FY20 Threats CONEMP Tech Assessment	2	2020	3	2020
NGSW Multi-Domain: NGSW Multi-Domain FY20 Modeling Preparations	3	2020	4	2020
NGSW Multi-Domain: NGSW Multi-Domain FY20 Mission Modeling	4	2020	1	2021
NGSW Integration: NGSW Integration Modeling Preparations	1	2020	1	2020
NGSW Integration: NGSW Integration FY19 Mission Integration	2	2020	2	2020
NGSW Integration: NGSW Integration FY20 Mission Integration	3	2020	3	2020
NGSW Integration: NGSW Integration FY20 Mission Integration Increment 2	1	2021	1	2021
NGSW Increment I/II: Technology Investment Enablers for INC I / INC II Capabilities	1	2019	4	2023
Additional Studies: Study Opportunity	2	2020	1	2021
Facility: FY 19 Security and HW Update	2	2019	2	2019
Facility: FY 19 Info Update	3	2019	3	2019
Facility: FY 20 Security and HW Update	2	2020	2	2020
Facility: FY 20 Info Update	3	2020	3	2020
Facility: FY 21 Security and HW Update	2	2021	2	2021
Facility: FY 21 Info Update	3	2021	3	2021
Facility: FY 22 Security and HW Update	2	2022	2	2022

**UNCLASSIFIED**

**Exhibit R-4A, RDT&E Schedule Details:** PB 2021 Navy **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604659N / <i>Precision Strike Weapons Development Program</i>	<b>Project (Number/Name)</b> 3378 / <i>Next Generation Land Attack Weapon (NGLAW)</i>
--	---	--

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Facility: FY 22 Info Update	3	2022	3	2022
Facility: FY 23 Security and HW Update	2	2023	2	2023
Facility: FY 23 Info Update	3	2023	3	2023
Facility: FY 24 Security and HW Update	2	2024	2	2024
Facility: FY 24 Info Update	3	2024	3	2024
Facility: FY 25 Security and HW Update	2	2025	2	2025
Facility: FY 25 Info Update	3	2025	3	2025

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy										<b>Date:</b> February 2020		
<b>Appropriation/Budget Activity</b> 1319 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0604659N / Precision Strike Weapons Development Program				<b>Project (Number/Name)</b> 3407 / Air Launched Decoy Development			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
3407: Air Launched Decoy Development	18.635	74.732	105.306	79.724	-	79.724	49.265	12.285	6.743	6.883	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

This project develops a Navy variant of the Miniature Air Launched Decoy (MALD). The variant will address current and future advanced Integrated Air Defense System (IADS) threats by bringing an air-launched, stand-in EW capability to Department of the Navy (DON) suppression of enemy air defenses/destruction of enemy air defenses (SEAD/DEAD) and standoff conventional land strike. A Navy variant of MALD with stand-in capability increases the range and duration of EW systems while providing flexibility to commanders for employment. To the maximum extent possible, the Navy will utilize existing technology from the current MALD-J production line and other common components (e.g. navigation, communication, guidance and control, payload) to reduce cost, shorten development timelines and promote interoperability. OPNAV approved requirements in a Capability Development Document (CDD) 2Q2018.

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<b>Title:</b> Miniature Air Launched Decoy (MALD)	74.732	105.306	79.724	0.000	79.724
<b>Articles:</b>	-	-	-	-	-
<b>FY 2020 Plans:</b> FY 2020 builds upon the FY 2019 Engineering and Manufacturing Development (EMD) effort. FY 2020 continues component maturation toward Production Readiness Review, to verify production capability prior to Low Rate Initial Production decision and prepare for Test Readiness Assessment, prior to first free flight test. Integrated Test and Evaluation (IT&E) to continue to progress towards IOC will begin in FY 2020.					
<b>FY 2021 Base Plans:</b> FY 2021 builds upon the FY 2020 EMD effort. FY 2021 will complete component maturation through Production Readiness Review and Test Readiness Review in support of free flight test event. FY 2021 will continue integration of IOC software and ramp up IT&E efforts in support of Initial Operational Capability (IOC).					
<b>FY 2021 OCO Plans:</b> N/A					
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> The FY 2020 to FY 2021 funding request was reduced by \$14.201 million to account for the availability of prior year execution balances, \$0.103 million for NWCF rate adjustments and \$11.278 million is due to progression in					

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604659N / <i>Precision Strike Weapons Development Program</i>	<b>Project (Number/Name)</b> 3407 / <i>Air Launched Decoy Development</i>

<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
developmental efforts as material purchases ramp down and the program transitions into integrated test. Total reduction amount \$25.582 million.					
<b>Accomplishments/Planned Programs Subtotals</b>	74.732	105.306	79.724	0.000	79.724

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

<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021 Base</u>	<u>FY 2021 OCO</u>	<u>FY 2021 Total</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To Complete</u>	<u>Total Cost</u>
• WPN/2285: <i>Drones and Decoys</i>	0.000	0.000	41.256	-	41.256	84.129	133.686	136.356	79.082	0.000	474.509

**Remarks**

**D. Acquisition Strategy**

The MALD-N Acquisition Category (ACAT) II program is an evolution from the previous United States Air Force (USAF) MALD-J program and is managed by Program Executive Office, Unmanned Aviation & Strike Weapons (PEO(U&W)), PMA-201 Precision Strike Weapons Program Office. PEO(U&W) has been delegated Milestone Decision Authority (MDA) and chairs quarterly Executive Steering Boards which ensure timely communications. MALD-N is being implemented as a Model 4 acquisition program to expedite the fielding of capability to the Fleet. The MALD-N program will use event-driven "Knowledge Points" (KP) at key program strategic inflection points to brief progress to stakeholders throughout the program life-cycle. The program met the statutory requirements associated with Milestone B at Knowledge Point 2 (1Q FY2019). With the removal of FY 2020 production funding, a Quick Reaction Assessment (QRA) to support an FY 2021 Early Operational Capability (EOC) will not be conducted. The MALD-N program will continue to progress towards Initial Operational Capabilities (IOC) which will be achieved by Initial Operational Test and Evaluation (IOT&E) in FY 2022. MALD-N will use a capabilities-based acquisition approach to characterize performance and evolve an IOC system for Fleet integration.

MALD is integral to realizing the National Defense Strategy of combat-credible military forces to deter war, protect the security of our nation and to enable the Joint Force to win should deterrence fail. The development and acquisition of MALD has been structured to be fielded at a pace relevant to maintain overmatch against long-term strategic competition. Specifically MALD supports greater performance of the acquisition system and is demonstrating the delivery of performance at the speed of relevance; organizational structure that supports innovation with a rapid approach that dramatically decreases the timeline from development to fielding.

**UNCLASSIFIED**

Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy												Date: February 2020			
Appropriation/Budget Activity 1319 / 4				R-1 Program Element (Number/Name) PE 0604659N / Precision Strike Weapons Development Program						Project (Number/Name) 3407 / Air Launched Decoy Development					
Product Development (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Product Development	SS/CPIF	Raytheon Missile Systems : Tucson, AZ	12.183	46.785	Jan 2019	75.424	Nov 2019	42.504	Jan 2021	-		42.504	Continuing	Continuing	Continuing
<b>Subtotal</b>			12.183	46.785		75.424		42.504		-		42.504	Continuing	Continuing	N/A
Support (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Support	WR	NAWC AD : Patuxent River, MD	2.000	5.250	Nov 2018	6.983	Nov 2019	7.200	Nov 2020	-		7.200	Continuing	Continuing	Continuing
Government Support	WR	NAWC WD : China Lake, CA	2.931	11.177	Nov 2018	5.750	Nov 2019	5.888	Nov 2020	-		5.888	Continuing	Continuing	Continuing
Government Support	WR	NAWC WD : Point Mugu, CA	0.515	3.270	Nov 2018	4.184	Nov 2019	4.284	Nov 2020	-		4.284	Continuing	Continuing	Continuing
<b>Subtotal</b>			5.446	19.697		16.917		17.372		-		17.372	Continuing	Continuing	N/A
Test and Evaluation (\$ in Millions)				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Support	WR	NAWC AD : Patuxent River, MD	0.000	4.954	Nov 2018	7.639	Nov 2019	12.600	Nov 2020	-		12.600	Continuing	Continuing	Continuing
Government Support	WR	NAWC WD : China Lake, CA	0.000	2.500	Nov 2018	4.200	Nov 2019	5.800	Nov 2020	-		5.800	Continuing	Continuing	Continuing
<b>Subtotal</b>			0.000	7.454		11.839		18.400		-		18.400	Continuing	Continuing	N/A

**UNCLASSIFIED**

**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604659N / <i>Precision Strike Weapons Development Program</i>	<b>Project (Number/Name)</b> 3407 / <i>Air Launched Decoy Development</i>
--	---	--

<b>Management Services (\$ in Millions)</b>				<b>FY 2019</b>		<b>FY 2020</b>		<b>FY 2021 Base</b>		<b>FY 2021 OCO</b>		<b>FY 2021 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>			
Government Support	WR	NAWC AD : Patuxent River, MD	0.500	0.333	Nov 2018	0.564	Nov 2019	0.575	Nov 2020	-		0.575	Continuing	Continuing	Continuing
Government Support	WR	NAWC WD : China Lake, CA	0.256	0.171	Nov 2018	0.170	Nov 2019	0.173	Nov 2020	-		0.173	Continuing	Continuing	Continuing
Project Management Support	C/CPFF	NAWC AD : Patuxent River, MD	0.200	0.212	Nov 2018	0.312	Mar 2020	0.600	Mar 2021	-		0.600	Continuing	Continuing	Continuing
Travel	Various	NAVAIR : Patuxent River, MD	0.050	0.080	Nov 2018	0.080	Nov 2019	0.100	Nov 2020	-		0.100	Continuing	Continuing	Continuing
<b>Subtotal</b>			1.006	0.796		1.126		1.448		-		1.448	Continuing	Continuing	N/A

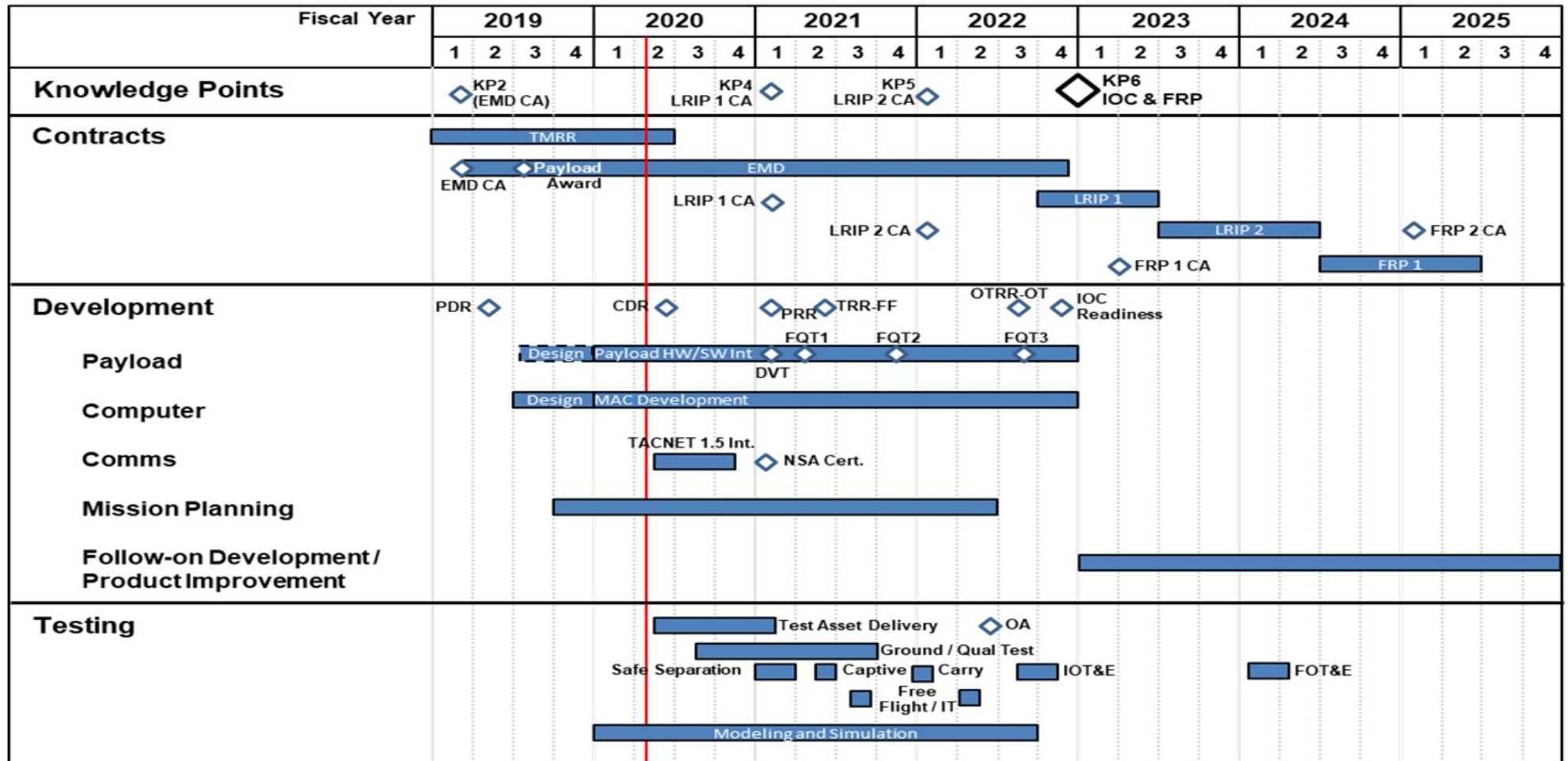
**Remarks**  
Increases in Project Management support provides additional support for test and evaluation which ramps up in FY 2021.

	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Project Cost Totals</b>	18.635	74.732	105.306	79.724	-	79.724	Continuing	Continuing	N/A

**Remarks**

**UNCLASSIFIED**

<b>Exhibit R-4, RDT&amp;E Schedule Profile: PB 2021 Navy</b>	<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604659N / Precision Strike Weapons Development Program
<b>Project (Number/Name)</b> 3407 / Air Launched Decoy Development	



**UNCLASSIFIED**

<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604659N / <i>Precision Strike Weapons Development Program</i>	<b>Project (Number/Name)</b> 3407 / <i>Air Launched Decoy Development</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b><i>Miniature Air Launched Decoy</i></b>				
Milestones: Initial Operational Capablity	4	2022	4	2022
Product Development: Contract Award: EMD Contract Award	2	2019	2	2019
Product Development: Product Development: Engineering and Manufacturing Development	2	2019	4	2022
Product Development: Product Development: Follow-on Development	1	2023	4	2025
Test and Evaluation: Modeling and Simulation	1	2020	3	2022
Test and Evaluation: Ground / Qual Test	2	2020	3	2021
Test and Evaluation: IOT&E	3	2022	4	2022
Test and Evaluation: FOT&E	1	2024	2	2024

**UNCLASSIFIED**

**Exhibit R-2A, RDT&E Project Justification:** PB 2021 Navy **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604659N / <i>Precision Strike Weapons Development Program</i>	<b>Project (Number/Name)</b> 3409 / <i>Advanced Aerial Refueling System</i>
--	---	--

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
3409: <i>Advanced Aerial Refueling System</i>	0.000	0.000	0.000	5.995	-	5.995	6.994	6.994	0.000	0.000	0.000	19.983
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

The Advanced Aerial Refueling Store (AARS) incorporates new technologies to be the next generation of Aerial Refueling. This variant will increase safety of flight, facilitate unmanned tanker to refuel receiver aircraft, incorporate better health and diagnostics information and improved fail-safe technology. The AARS will increase reliability and decrease aerial refueling mishaps.

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

	FY 2019	FY 2020	FY 2021 Base	FY 2021 OCO	FY 2021 Total
<b>Title:</b> Advanced Aerial Refueling System	0.000	0.000	5.995	0.000	5.995
<b>Articles:</b>	-	-	-	-	-
<b>FY 2020 Plans:</b> N/A					
<b>FY 2021 Base Plans:</b> New Start in FY 2021. Funding provided for the development and testing of the next generation of aerial refueling stores, to include the development of drawings and specifications for prototypes.					
<b>FY 2021 OCO Plans:</b> N/A					
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Increase of \$5.999 million in FY 2021 for the first year of the project to develop and test a prototype of the next generation Advanced Aerial Refueling Store (AARS).					
<b>Accomplishments/Planned Programs Subtotals</b>	0.000	0.000	5.995	0.000	5.995

**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/0720: <i>War Consumables</i>	42.035	32.086	40.633	-	40.633	43.383	44.297	51.191	61.096	Continuing	Continuing

**Remarks**

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2021 Navy		Date: February 2020
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0604659N / Precision Strike Weapons Development Program	Project (Number/Name) 3409 / Advanced Aerial Refueling System

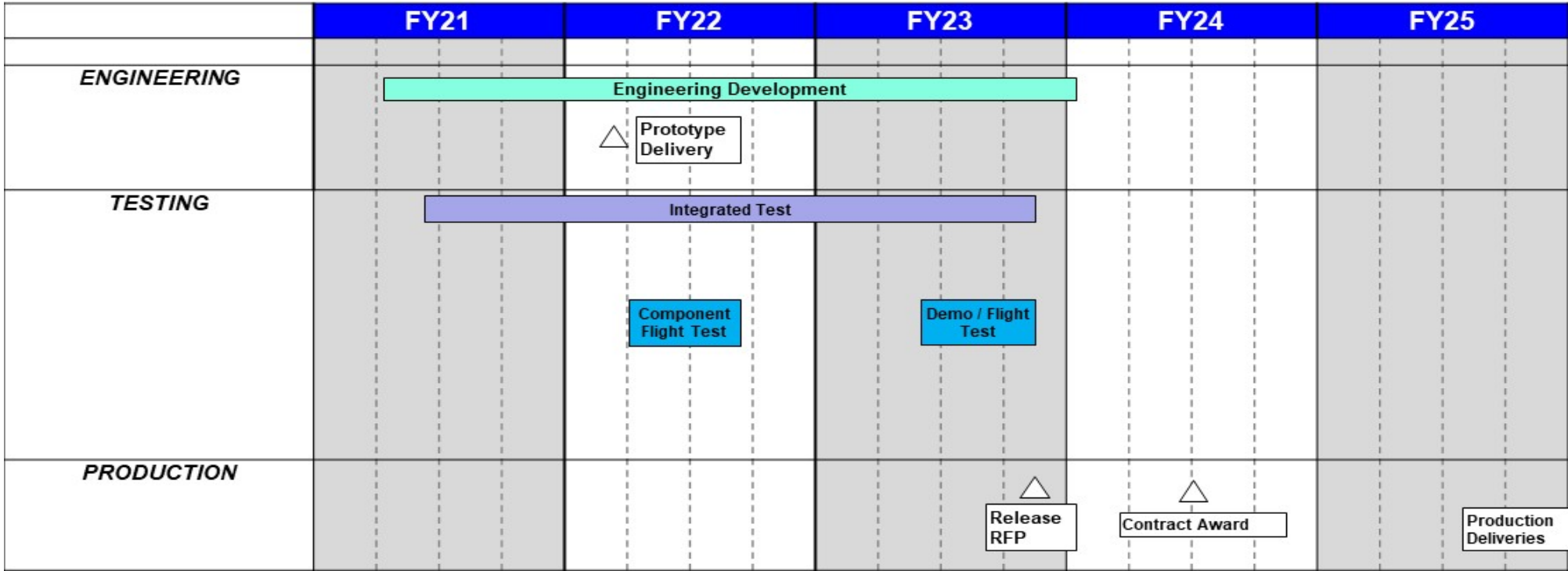
**D. Acquisition Strategy**

The Advanced Aerial Refueling Store (AARS) program will develop, prototype and test the next generation Aerial Refueling Store utilizing a Model 8 Hybrid Program structure. The program will evaluate technologies matured under science and technology initiatives for inclusion into the AARS to maximize reliability and safety while making improvements that reduce refueling time and system drag. AARS is managed by Program Executive Office, Unmanned Aviation & Strike Weapons (PEO(U&W)), PMA-201 Precision Strike Weapons Program Office.



**UNCLASSIFIED**

<b>Exhibit R-4, RDT&amp;E Schedule Profile: PB 2021 Navy</b>		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604659N / Precision Strike Weapons Development Program	<b>Project (Number/Name)</b> 3409 / Advanced Aerial Refueling System



**UNCLASSIFIED**

<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604659N / <i>Precision Strike Weapons Development Program</i>	<b>Project (Number/Name)</b> 3409 / <i>Advanced Aerial Refueling System</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>Proj 3409</b>				
System Development: System Development Contract Award	2	2021	2	2021
System Development: Engineering Development	2	2021	3	2024
System Development: Prototype Delivery	1	2022	1	2022
Test: Integrated Test	2	2021	4	2023
Test: Component Flight Test	2	2022	3	2022
Test: Demo/ Flight Test	2	2023	4	2023
Production: Release AARS RFP	4	2023	4	2023
Production: Award Production Contract	3	2024	3	2024

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy										<b>Date:</b> February 2020		
<b>Appropriation/Budget Activity</b> 1319 / 4					<b>R-1 Program Element (Number/Name)</b> PE 0604659N / Precision Strike Weapons Development Program				<b>Project (Number/Name)</b> 3411 / CAD/PAD Digital Twin Modeling			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
3411: CAD/PAD Digital Twin Modeling	0.000	0.000	0.000	0.800	-	0.800	0.800	0.700	0.699	0.499	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**

Cartridge Actuated Devices/ Propellant Actuated Devices (CAD/PAD) Digital Twin Modeling will develop and validate models and algorithms for the Department of the Navy (DoN). Digital Twin is a software model that predicts service life of a components' energetic material. This will be used to move towards a Condition Based Maintenance Model vice restrictive service life. The development will be phased over three efforts, specific to Navy AirCrew Common Ejection Seats (NACES). These models will be used as a starting point for a condition based service life for CAD/PAD. A condition based service life will result in long term cost savings for the DoN by enabling CAD/PAD to be installed for full useful service life. These models will also be used to support initial service life decisions, service life extension decisions, and address obsolescence.

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

	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021 Base</b>	<b>FY 2021 OCO</b>	<b>FY 2021 Total</b>
<b>Title:</b> CAD/PAD Digital Twin Modeling	0.000	0.000	0.800	0.000	0.800
<b>Articles:</b>	-	-	-	-	-
<b>FY 2020 Plans:</b> N/A					
<b>FY 2021 Base Plans:</b> New start will begin in FY 2021. Software development efforts begin initiating software validation of the digital twin model. Test articles will be obtained, and testing will start for the digital twin in FY21.					
<b>FY 2021 OCO Plans:</b> N/A					
<b>FY 2020 to FY 2021 Increase/Decrease Statement:</b> Funding increased from \$0 in FY 2020 by \$0.8 million in FY 2021 to develop and validate the digital twin model to support initial service life decisions and service life extension decisions.					
<b>Accomplishments/Planned Programs Subtotals</b>	0.000	0.000	0.800	0.000	0.800

**UNCLASSIFIED**

<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604659N / <i>Precision Strike Weapons Development Program</i>	<b>Project (Number/Name)</b> 3411 / <i>CAD/PAD Digital Twin Modeling</i>

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

<u>Line Item</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>FY 2021</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>FY 2025</u>	<u>Cost To</u>	
			<u>Base</u>	<u>OCO</u>	<u>Total</u>					<u>Complete</u>	<u>Total Cost</u>
• PANMC/0180: <i>CARTRIDGE ACTUATED DEVICES/ PROPELLANT ACT DEVICES</i>	64.056	52.941	64.694	3.927	68.621	69.937	71.144	72.342	74.110	Continuing	Continuing

**Remarks**

The software development for CAD/PAD products to support inventory objectives by transitioning to condition based maintenance. Recent investigations into life cycle cost savings, safety mitigation and reliability of products indicate that a substantial costs savings could be realized, address obsolescence, as well as improve readiness.

**D. Acquisition Strategy**

Lone Star, LLC has a proven methodology to develop computer models (digital twin) relevant to the thermal loading CAD/PAD items are subjected to. A sole source contract will be let to Lone Star, LLC to develop a digital twin using their proprietary software, Tru Navigator. The Tru Navigator software will use as its input, key areas of degradation to CAD/PAD items (temperature, humidity, shock, vibration and thermal cycling) and its output will be the cumulative degradation to the CAD/PAD item. Additional technologies and associated vendors will also be evaluated as necessary.

All other efforts; procurement of CAD/PAD test items, test and evaluation, and model validation will be sourced using competitive contracting strategies.

**UNCLASSIFIED**

**Exhibit R-3, RDT&E Project Cost Analysis: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604659N / <i>Precision Strike Weapons Development Program</i>	<b>Project (Number/Name)</b> 3411 / <i>CAD/PAD Digital Twin Modeling</i>
--	---	---

<b>Product Development (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Product Development	SS/CPIF	Lone Star, LLC : Addison, TX	0.000	0.000		0.000		0.400	Feb 2021	-		0.400	Continuing	Continuing	Continuing
<b>Subtotal</b>			0.000	0.000		0.000		0.400		-		0.400	Continuing	Continuing	N/A

**Remarks**  
A sole source contract to Lone Star, LLC will be executed to develop the digital twin models using Tru Navigator.

<b>Support (\$ in Millions)</b>				FY 2019		FY 2020		FY 2021 Base		FY 2021 OCO		FY 2021 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Government Support	WR	NSWC : Indian Head	0.000	0.000		0.000		0.400	Nov 2020	-		0.400	Continuing	Continuing	Continuing
<b>Subtotal</b>			0.000	0.000		0.000		0.400		-		0.400	Continuing	Continuing	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
<b>Project Cost Totals</b>			0.000	0.000	0.000	0.800	-	0.800	Continuing	Continuing	N/A

**Remarks**

**UNCLASSIFIED**

**Exhibit R-4, RDT&E Schedule Profile: PB 2021 Navy** **Date:** February 2020

<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604659N / <i>Precision Strike Weapons Development Program</i>	<b>Project (Number/Name)</b> 3411 / <i>CAD/PAD Digital Twin Modeling</i>
--	---	---

Fiscal Year	2019				2020				2021				2022				2023				2024				2025			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<b>Milestones</b>																												
<b>Product Development</b>																												
<b>Contract Awards</b>																												
<b>Model Validation Phase I</b>																												
<b>Prod Test &amp; Dev. Phase II</b>																												
<b>Prod Test &amp; Dev. Phase II</b>																												
<b>Systems Development</b>																												
<b>Test &amp; Evaluation</b>																												

◆ Digital Twin Dev.

◆ Digital Twin Dev.

Measure/Run/Implement

Develop/Run/Test/Implement

Develop/Run/Test/Implement

**UNCLASSIFIED**

<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2021 Navy		<b>Date:</b> February 2020
<b>Appropriation/Budget Activity</b> 1319 / 4	<b>R-1 Program Element (Number/Name)</b> PE 0604659N / <i>Precision Strike Weapons Development Program</i>	<b>Project (Number/Name)</b> 3411 / <i>CAD/PAD Digital Twin Modeling</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b><i>CAD/PAD Digital Twin Modeling</i></b>				
Product Development: Contract Awards: FY21 Lone Star Contract Award	2	2021	2	2021
Product Development: Contract Awards: FY23 Lone Star Contract Award	2	2023	2	2023
Product Development: Model Validation Phase I: Model Validation Phase I	2	2021	3	2023
Product Development: Product Test and Development Phase II: Product Test and Development Phase II	2	2021	1	2025
Product Development: Product Test and Development Phase III: Product Test and Development Phase III	2	2021	1	2025