

UNCLASSIFIED

Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy **Date:** February 2016

Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0603599N / <i>Frigate Development</i>
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------

COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
Total Program Element	0.000	0.000	30.000	84.900	-	84.900	62.800	71.400	33.500	37.700	Continuing	Continuing
3086: <i>Frigate</i>	0.000	0.000	30.000	84.900	-	84.900	62.800	71.400	33.500	37.700	Continuing	Continuing

Note
 PE 0603599N was created per Congressional direction to establish a new budget line item.

A. Mission Description and Budget Item Justification

This Program Element (PE) provides funds for the design, development, issue resolution, certification, and testing of the Frigate (FF). The Frigate will be a multi-mission ship that will leverage the existing Littoral Combat Ship (LCS) designs, focusing on anti-surface warfare and anti-submarine warfare capabilities (SUW/ASW).

B. Program Change Summary (\$ in Millions)

	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017 Base</u>	<u>FY 2017 OCO</u>	<u>FY 2017 Total</u>
Previous President's Budget	0.000	0.000	0.000	-	0.000
Current President's Budget	0.000	30.000	84.900	-	84.900
Total Adjustments	0.000	30.000	84.900	-	84.900
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	30.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	0.000	0.000	84.900	-	84.900

Change Summary Explanation

PE 0603599N was created in FY16 to establish the Frigate PE. \$84.9M was transferred from PE 0603581N LCS PE to this PE.

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy										Date: February 2016		
Appropriation/Budget Activity 1319 / 4					R-1 Program Element (Number/Name) PE 0603599N / <i>Frigate Development</i>				Project (Number/Name) 3086 / <i>Frigate</i>			
COST (\$ in Millions)	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	FY 2018	FY 2019	FY 2020	FY 2021	Cost To Complete	Total Cost
3086: <i>Frigate</i>	0.000	0.000	30.000	84.900	-	84.900	62.800	71.400	33.500	37.700	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

As directed by the Secretary of Defense (SECDEF), the Navy via the Small Surface Combatant Task Force (SSCTF) reviewed the capabilities of Littoral Combat Ship (LCS) and explored alternatives to provide a more lethal and survivable ship to meet future missions. The SSCTF recommendations served as the foundation for the revised requirements for the modified LCS (designated as the Frigate (FF)).

The RDT&E for the Frigate Program will leverage existing LCS processes and infrastructure to ensure the success of the Frigate and commonality with LCS. Frigate efforts comprise design and development efforts for a more lethal and survivable multi-mission warship focusing on both anti-surface warfare and anti-submarine warfare capabilities (SUW/ASW). Additionally, it includes design, development, issue resolution, certification and testing efforts required to support the design baseline for 11 Frigates (FY19-25).

The Frigate design and development phases include platform design and development, experimentation, combat system element integration, development of Technical Data Packages(TDPs), total ship system engineering and integration, combat systems and warfare systems certification, and planning and conduct of system testing. These efforts include procurement of combat and warfare system elements and/or simulators to support production representative testing in support of design, development, and certification efforts and ordnance in support of testing. Primary design modifications will include an over-the-horizon surface-to-surface missile system, upgraded air defense weapons and sensors, advanced electronic warfare system and improved decoys, and the ability to employ all elements of the SUW and ASW mission packages (horizon surface-to-surface missile system, 30mm guns, variable depth sonar, towed array and torpedo defense).

The RDT&E portion of Frigate funding is also composed of formal Developmental and Operational Assessment testing of the Frigates. Test and Evaluation (T&E) will concentrate on verifying integration and interoperability of employed technologies and systems in the Frigate designs to achieve the mission capabilities and performance requirements as defined in the Frigate program's baseline Capabilities Development Documents (CDD) (currently in the Navy approval phase). T&E functions will include the evaluation of Critical Technical Parameters (CTP), Measures of Effectiveness (MOE), Measures of Suitability (MOS), and Key Performance Parameters (KPP).

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

	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Title: Test & Evaluation	0.000	0.200	4.000	0.000	4.000
Articles:	-	-	-	-	-
Description: Execute formal Frigate test planning in support of Developmental Testing and Operational Testing (DT/OT), including Live Fire Test and Evaluation (LFT&E), and procurement of T&E Ordnance. Plan for and execute DT and C4I integration, and test; aviation (manned and unmanned) integration.					

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603599N / <i>Frigate Development</i>	Project (Number/Name) 3086 / <i>Frigate</i>

B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
<p><i>FY 2015 Accomplishments:</i> N/A</p> <p><i>FY 2016 Plans:</i> Conduct development Frigate program Test and Evaluation Master Plan (TEMP) updates from existing LCS TEMP. Conduct analysis of future Frigate testing approaches throughout the development cycle.</p> <p><i>FY 2017 Base Plans:</i> Conduct development Frigate program Test and Evaluation Master Plan (TEMP) updates from existing LCS TEMP. Develop plan to support future updates required to support land-based SIM/STIM, modeling and test requirements for the Frigate platform. Continue analysis of future Frigate testing approaches throughout the development cycle.</p> <p><i>FY 2017 OCO Plans:</i> N/A</p>					
<p><i>Title:</i> Ship Systems / C4I / Warfare Systems Engineering</p> <p align="right"><i>Articles:</i></p> <p><i>Description:</i> The Frigate will be a multi-mission ship that will leverage the existing Littoral Combat Ship (LCS) designs, and focusing on anti-surface warfare and anti-submarine warfare capabilities (SUW/ASW). The Frigate adds capability while maximizing the LCS investments made to date in the small surface combatant force. Modifications will include over-the-horizon surface-to-surface missile system, upgraded Air Defense weapons and sensors, advanced electronic warfare system and improved decoys, and all elements of the SUW and ASW mission packages (horizon surface-to-surface missile system, 30mm guns, variable depth sonar, towed array and torpedo defense).</p> <p><i>FY 2015 Accomplishments:</i> N/A</p> <p><i>FY 2016 Plans:</i> Conduct system engineering efforts to execute system requirements review (SRR) and prepare for future preliminary design review (PDR), including decomposing CDD requirements into system and warfare system element specifications, defining logical and physical interfaces, finalizing warfare system element selections, and conducting analyses to refine acquisition and contracting approaches for the FF systems. This includes analysis, engineering</p>	0.000 -	29.800 -	80.900 -	0.000 -	80.900 -

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy	Date: February 2016
--------------------------------------------------------------------	----------------------------

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603599N / <i>Frigate Development</i>	Project (Number/Name) 3086 / <i>Frigate</i>
--------------------------------------------------	--------------------------------------------------------------------------------------	-------------------------------------------------------

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

	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
<p>design work and testing for OTH missile system selection. Conduct ship preliminary design, naval architecture, machinery engineering, trade-off studies, and topside design analysis for both LCS ship variants to integrate warfare system, vulnerability, and recoverability improvements. Fund LCS shipbuilders and prime integrators to assess weight reduction initiatives and design feasibility of improved systems on LCS Class ships no later than FY19.</p> <p><i>FY 2017 Base Plans:</i> Increase from FY16 to FY17 is to support development efforts detailed below to support procurement of the FF starting in FY19.</p> <p>Ship Systems Engineering Continue system engineering efforts related to naval architecture, machinery engineering and topside design analysis. Effort will be focused on enhancing data developed during the Preliminary Design (PD) period within the structures, mass properties, stability, materials, hydrodynamics and arrangements/habitability disciplines to develop a biddable Technical Data Package (TDP) in support of the FY17 Request for Proposal (RFP). Emphasis will be placed on the structural and stability disciplines, consisting of modeling, and incorporation of lethality and survivability enhancements to the LCS Flight 0+ design, to include the flow-down impacts to the supporting machinery and electrical systems.</p> <p>C4I / Warfare Systems Engineering Continue system engineering efforts related to C4I and warfare systems specifications. Transition preliminary design efforts to a biddable Technical Data Package (TDP) to inform planned FY2017 shipbuilding contract Request for Proposals (RFP). Continue OTH systems engineering and testing efforts for integration of OTH missile. Continue CMS development efforts to ensure full ship integration aligns with total ship design efforts. Finalize all SWaP data for C4I suites. Develop a test, integration and certification capability. Integrate other CS elements into total ship design. Implement additional cyber security/information assurance (IA) measures on the warfare system and C4I suite to pace the current threat.</p> <p><i>FY 2017 OCO Plans:</i> N/A</p>					
Accomplishments/Planned Programs Subtotals	0.000	30.000	84.900	0.000	84.900

UNCLASSIFIED

Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy	Date: February 2016
--------------------------------------------------------------------	----------------------------

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603599N / <i>Frigate Development</i>	Project (Number/Name) 3086 / <i>Frigate</i>
--------------------------------------------------	--------------------------------------------------------------------------------------	-------------------------------------------------------

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

<u>Line Item</u>	<u>FY 2015</u>	<u>FY 2016</u>	<u>FY 2017</u> <u>Base</u>	<u>FY 2017</u> <u>OCO</u>	<u>FY 2017</u> <u>Total</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• SCN/2127: <i>Littoral Combat Ship</i>	1,584.094	1,414.265	1,211.625	-	1,211.625	669.275	906.182	773.697	1,416.067	0.000	16,768.719

Remarks

D. Acquisition Strategy

The current Acquisition Strategy for Frigate is to down select to one variant in FY19. The draft Acquisition Strategy document will be completed in FY16 to allow for a Request for Proposal (RFP) to be released late in FY17 to support Frigate procurement in FY19.

E. Performance Metrics

T&E functions will include the evaluation of Critical Technical Parameters (CTP), Measures of Effectiveness (MOE), Measures of Suitability (MOS), and Key Performance Parameters(KPP). The LCS program conducts annual Defense Acquisition Board In-Process Reviews (DAB IPRs). The first Seaframe and Mission Module integrated program DAB IPR was conducted in January 2013 and is held in September thereafter.

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy **Date:** February 2016

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603599N / <i>Frigate Development</i>	Project (Number/Name) 3086 / <i>Frigate</i>
--------------------------------------------------	--------------------------------------------------------------------------------------	-------------------------------------------------------

Product Development (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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
Ship Design Modifications	C/CPAF	Lockheed Martin : Various	0.000	0.000		5.555	Nov 2015	16.777	Nov 2016	-		16.777	Continuing	Continuing	Continuing
Ship Design Modifications	C/CPAF	Austal : Mobile, AL	0.000	0.000		5.277	Nov 2015	12.835	Nov 2016	-		12.835	Continuing	Continuing	Continuing
Warfare Systems Development	WR	NSWC, DD : Dahlgren, VA	0.000	0.000		3.339	Nov 2015	11.729	Nov 2016	-		11.729	Continuing	Continuing	Continuing
C4I Development	WR	PEO C4I : San Diego, CA	0.000	0.000		0.850	Nov 2015	1.059	Nov 2016	-		1.059	Continuing	Continuing	Continuing
Aviation Integration Development	WR	NAWC, AD : Patuxent River, MD	0.000	0.000		0.350	Nov 2015	0.707	Nov 2016	-		0.707	Continuing	Continuing	Continuing
Warfare Systems Development	WR	NUWC, Newport : Newport, RI	0.000	0.000		0.062	Nov 2015	0.126	Nov 2016	-		0.126	Continuing	Continuing	Continuing
C4I Development	WR	SPAWAR : Charleston, SC	0.000	0.000		1.106	Nov 2015	1.589	Nov 2016	-		1.589	Continuing	Continuing	Continuing
C4I Development	WR	SPAWAR : San Diego, CA	0.000	0.000		0.390	Nov 2015	1.485	Nov 2016	-		1.485	Continuing	Continuing	Continuing
Common Combat Management System Development (CMS)	C/BA	Lockheed Martin : Various	0.000	0.000		2.360	Dec 2015	15.468	Dec 2016	-		15.468	Continuing	Continuing	Continuing
Radar Development	WR	NSWC, Crane : Crane, Indiana	0.000	0.000		0.000	Nov 2015	0.301	Nov 2016	-		0.301	Continuing	Continuing	Continuing
Over the Horizon (OTH) Missile Development	WR	NAWC, China Lake : China Lake, CA	0.000	0.000		0.450	Nov 2015	0.909	Nov 2016	-		0.909	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		19.739		62.985		-		62.985	-	-	-

Support (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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 Engineering Support	WR	NSWC, CD : Carderock, MD	0.000	0.000		1.952	Nov 2015	5.423	Nov 2016	-		5.423	Continuing	Continuing	Continuing
Government Engineering Support	WR	NSWC, SSES : Philadelphia, PA	0.000	0.000		0.992	Nov 2015	2.964	Nov 2016	-		2.964	Continuing	Continuing	Continuing

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy												Date: February 2016			
Appropriation/Budget Activity				R-1 Program Element (Number/Name)				Project (Number/Name)							
1319 / 4				PE 0603599N / Frigate Development				3086 / Frigate							
Support (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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 Engineering Support	WR	NSWC, DD : Dahlgren, VA	0.000	0.000		0.040	Nov 2015	0.080	Nov 2016	-		0.080	Continuing	Continuing	Continuing
Government Engineering Support	WR	NSWC, Indian Head : Indian Head, MD	0.000	0.000		0.085	Nov 2015	0.171	Nov 2016	-		0.171	Continuing	Continuing	Continuing
Contractor Engineering Support	C/CPAF	Alion : Arlington, VA	0.000	0.000		1.771	Dec 2015	2.907	Dec 2016	-		2.907	Continuing	Continuing	Continuing
Contractor Engineering Support	C/CPAF	Booz Allen Hamilton : McLean, VA	0.000	0.000		0.727	Dec 2015	0.778	Dec 2016	-		0.778	0.000	1.505	-
Subtotal			0.000	0.000		5.567		12.323		-		12.323	-	-	-
Test and Evaluation (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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
Test & Evaluation	WR	NSWC, DD : Dahlgren, VA	0.000	0.000		0.200	Mar 2016	4.000	Nov 2016	-		4.000	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		0.200		4.000		-		4.000	-	-	-
Management Services (\$ in Millions)				FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 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
Program Management Support	C/CPAF	Alion : Arlington, VA	0.000	0.000		4.494	Dec 2015	5.592	Dec 2016	-		5.592	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		4.494		5.592		-		5.592	-	-	-
Project Cost Totals			0.000	0.000		30.000		84.900		-		84.900	-	-	-

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy	Date: February 2016
-------------------------------------------------------------------	----------------------------

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603599N / <i>Frigate Development</i>	Project (Number/Name) 3086 / <i>Frigate</i>
--------------------------------------------------	--------------------------------------------------------------------------------------	-------------------------------------------------------

	Prior Years	FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
--	-------------	---------	---------	--------------	-------------	---------------	------------------	------------	--------------------------

Remarks									
----------------	--	--	--	--	--	--	--	--	--

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2017 Navy

Date: February 2016

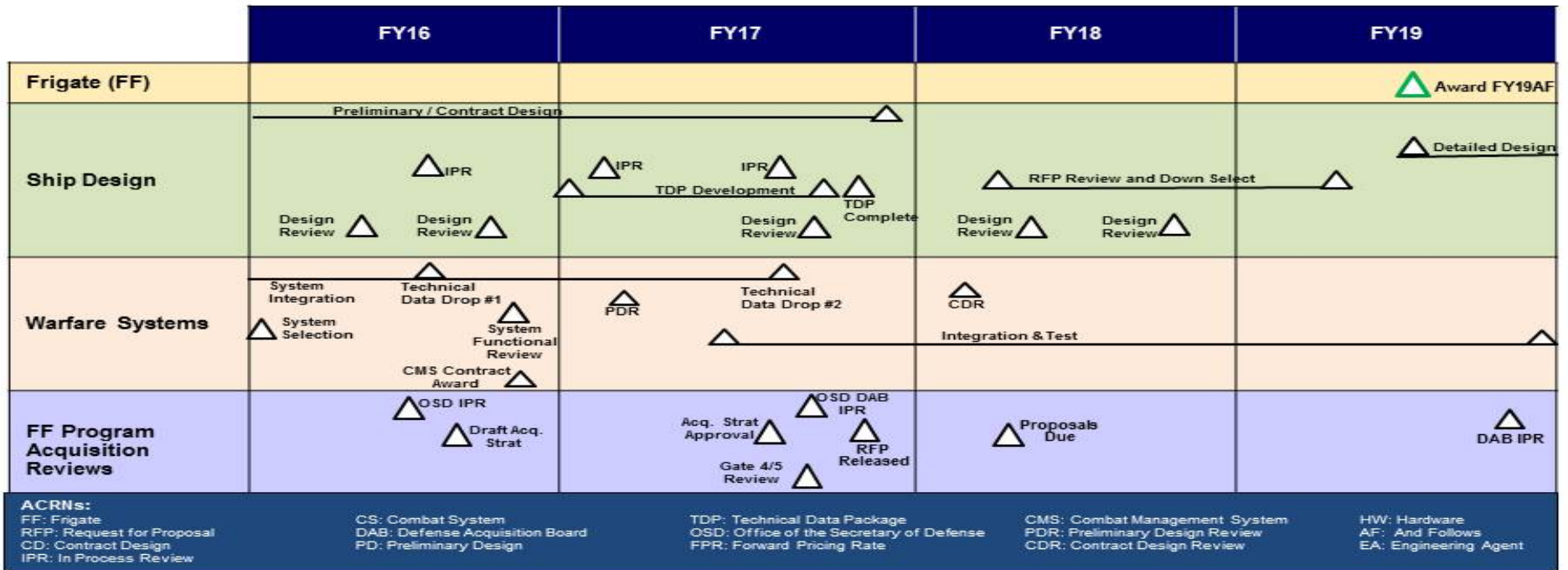
Appropriation/Budget Activity
1319 / 4

R-1 Program Element (Number/Name)
PE 0603599N / Frigate Development

Project (Number/Name)
3086 / Frigate



Notional Frigate Program Schedule



UNCLASSIFIED

Exhibit R-4A, RDT&E Schedule Details: PB 2017 Navy **Date:** February 2016

Appropriation/Budget Activity 1319 / 4	R-1 Program Element (Number/Name) PE 0603599N / <i>Frigate Development</i>	Project (Number/Name) 3086 / <i>Frigate</i>
--------------------------------------------------	--------------------------------------------------------------------------------------	-------------------------------------------------------

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Proj 3086				
Preliminary/ Contract Design	4	2015	4	2017
Warfare System Selection	1	2016	1	2016
Warfare Systems Integration	1	2016	3	2017
Technical Data Package Data Drop #1	3	2016	3	2016
Design Review #1	2	2016	2	2016
In Process Review #1	3	2016	3	2016
Draft Acquisition Strategy	3	2016	3	2016
Acquisition Strategy Approval	3	2017	3	2017
Design Review #2	4	2016	4	2016
In Process Review #2	1	2017	1	2017
Integration and Test	3	2017	4	2019
In Process Review #3	3	2017	3	2017
Design Review #3	3	2017	3	2017
Production RFP Released	4	2017	4	2017
Technical Data Package Data Drop #2	3	2017	3	2017
Design Review #4	2	2018	2	2018
Design Review #5	4	2018	4	2018
RFP Proposals Due	2	2018	2	2018
Detailed Design	3	2019	2	2021
RFP Review and Downselect	2	2018	2	2019