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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2020 Navy **Date:** March 2019

<b>Appropriation/Budget Activity</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 5: System Development &amp; Demonstration (SDD)</i>					<b>R-1 Program Element (Number/Name)</b> PE 0603208N / <i>Training System Aircraft</i>							
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020 Base</b>	<b>FY 2020 OCO</b>	<b>FY 2020 Total</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
Total Program Element	47.043	16.343	12.798	15.514	-	15.514	4.287	5.995	5.959	3.526	0.000	111.465
3367: <i>Training Aircraft Updates</i>	47.043	14.798	12.798	15.514	-	15.514	4.287	5.995	5.959	3.526	0.000	109.920
9999: <i>Congressional Adds</i>	0.000	1.545	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.545

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

This program element provides for design, development, integration and test of various pre-production platform improvements for Naval Undergraduate Flight Training Systems which include T-45, T-6, TH-57, T-44, Advanced Helicopter Training System, and Multi-Engine Advanced Trainer aircraft. Continued development engineering for improvements in reliability, maintainability, safety and meeting Federal Aviation Administration (FAA) Next Generation Air Transportation System (NextGen) flight safety requirements are required to ensure maximum benefit is achieved to provide effective cost of ownership and availability of aircraft to meet Chief of Naval Air Training (CNATRA) student training requirements. Specific efforts include: TH-57 Follow-On Training System; T-45, T-6, TH-57 and T-44 Training System Improvements, and T-45 and T-6 Physiological Episode (PE) mitigation analysis.

This program is funded under SYSTEM DEVELOPMENT AND DEMONSTRATION because it includes those projects conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full-rate production decision.

<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020 Base</b>	<b>FY 2020 OCO</b>	<b>FY 2020 Total</b>
Previous President's Budget	16.945	12.798	15.722	-	15.722
Current President's Budget	16.343	12.798	15.514	-	15.514
Total Adjustments	-0.602	0.000	-0.208	-	-0.208
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.566	0.000			
• Program Adjustments	0.000	0.000	-0.210	-	-0.210
• Rate/Misc Adjustments	0.000	0.000	0.002	-	0.002
• Congressional Directed Reductions	-1.636	-	-	-	-
Adjustments					
• Congressional Add Adjustments	1.600	-	-	-	-

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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2020 Navy		<b>Date:</b> March 2019	
<b>Appropriation/Budget Activity</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 5: System Development &amp; Demonstration (SDD)</i>		<b>R-1 Program Element (Number/Name)</b> PE 0603208N / <i>Training System Aircraft</i>	
<b>Congressional Add Details (\$ in Millions, and Includes General Reductions)</b>		<b>FY 2018</b>	<b>FY 2019</b>
<b>Project:</b> 9999: <i>Congressional Adds</i>			
Congressional Add: <i>T-45 and F/A-18 Physiological Episodes</i>		1.545	0.000
Congressional Add Subtotals for Project: 9999		1.545	0.000
Congressional Add Totals for all Projects		1.545	0.000
<b>Change Summary Explanation</b> The FY 2020 funding request was reduced by \$0.210 million to account for the availability of prior year execution balances.			
Technical: TH-57 Follow-On Training System funding is increased in support of Advanced Helicopter Training System (AHTS) program start and award of TH-XX contract.			
T-45 Required Avionics Sustainment program (RASP) FY2020 funding request was reduced due to RASP program transitioning efforts to retrofit ADS-B Out capability into aircraft.			
Training System Improvements funding for T-6 Crash Survivable Cockpit Voice Recorder (CSCVR), T-6 Controlled Flight Into Terrain (CFIT) Avoidance, T-45 Digital Inline Timer development, T-45 Next Generation Strike Aircraft Analysis of Alternatives(AoA) and T-44 Fatigue Life Extension Study.			
T-6B Flight Management System removed from budget to reflect program cancellation (FY19-FY20).			
Schedule:			
T-6B Flight Management System schedule removed from budget to reflect program cancellation (FY19-FY20).			
T-6 Joint Study Efforts extended from 4Q20 to 4Q21 in support of continued studies with the Joint Primary Aircraft Training System (JPATS) program office.			
Naval Aviation Physiological Episode schedule was changed to reflect program execution based on dynamic requirements. Changes included the removal of T-45 Physiological Episode Root Cause Analytic Project, Real-Time Air Quality Test Sensor Study extended to 4Q21 due to ongoing Physiological Episode mitigation studies, as well as adding T-6B PE support.			
Training System Improvement schedule was changed to include T-6 CSCVR, T-6 CFIT Avoidance, T-45 Digital Inline Timer development, T-45 Next Generation Strike Aircraft (AoA) and T-44 Fatigue Life Extension Study.			

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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Navy		Date: March 2019
<b>Appropriation/Budget Activity</b> 1319: <i>Research, Development, Test &amp; Evaluation, Navy / BA 5: System Development &amp; Demonstration (SDD)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0603208N / <i>Training System Aircraft</i>	
T-45 RASP Test asset deliveries delayed from 4Q18 to 3Q19 due to delays from contractor.		

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy										Date: March 2019		
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0603208N / Training System Aircraft				Project (Number/Name) 3367 / Training Aircraft Updates			
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
3367: Training Aircraft Updates	47.043	14.798	12.798	15.514	-	15.514	4.287	5.995	5.959	3.526	0.000	109.920
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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

The TH-57 Follow-On Training System:

The TH-57 Training System consists of TH-57B aircraft, TH-57C aircraft, and associated family of ground based training devices. The TH-57 Training System is experiencing obsolescence, diminishing manufacturing sources and material shortages, training capability gaps (as identified in the Capabilities based assessment Naval Aviation Undergraduate Flight Training), and increasingly expensive operating costs related to aging aircraft issues. This research and development effort will investigate alternatives for replacing the TH-57 training system and develop and validate the acquisition strategy for future procurement of the capability to continue to provide the fleet replacement squadrons with qualified and capable rotary-wing naval aviators. This effort includes, but is not limited to, market research, requirements development, evaluation of acquisition strategies, evaluation of proposals, and testing of prototypes.

Training System Improvements:

Efforts will provide for studies and analysis, design, development, integration and test of pre-production platform improvements for Naval Undergraduate Flight Training Systems, which will conduct engineering and manufacturing development tasks aimed at meeting validated requirements prior to full-rate production decisions.

T-45 and T-6 Physiological Episode (PE) Mitigation:

Efforts will provide for studies and development efforts to address mitigation of the T-45 and T-6 physiological episodes.

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

	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020 Base</b>	<b>FY 2020 OCO</b>	<b>FY 2020 Total</b>
<b>Title:</b> TH-57 Follow-On Training System	2.145	2.431	2.300	0.000	2.300
<b>Articles:</b>	-	-	-	-	-
<b>Description:</b> Funding supports development of alternatives for replacing the TH-57 training system and development and validation of the acquisition strategy for future procurement of the capability to continue to provide the fleet replacement squadrons with qualified and capable rotary-wing Naval Aviators. This effort includes, but is not limited to, market research, requirements development, evaluation of acquisition strategies, evaluation of proposals, and testing of prototypes.					

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy				Date: March 2019		
Appropriation/Budget Activity 1319 / 5		R-1 Program Element (Number/Name) PE 0603208N / Training System Aircraft		Project (Number/Name) 3367 / Training Aircraft Updates		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
<b>FY 2019 Plans:</b> Continue AHTS requirements development, evaluation of acquisition strategies, and evaluation of proposals. As well as release RFPs for helicopters and ground based training systems (GBTS). Conduct source selection and prepare for contract award and Milestone C/Full Rate Production (FRP). Begin drafting RFP for Contractor Logistics Support (CLS).						
<b>FY 2020 Base Plans:</b> Complete evaluation of proposals, continue curriculum development, receive Milestone C/Full Rate Production decision and award TH-XX contract.						
<b>FY 2020 OCO Plans:</b> N/A						
<b>FY 2019 to FY 2020 Increase/Decrease Statement:</b> The FY2020 funding request was decreased by \$0.131M due to award of TH-XX contract and transitioning efforts to production.						
<b>Title:</b> Training System Improvements		0.122	0.154	7.059	0.000	7.059
<b>Articles:</b>		-	-	-	-	-
<b>Description:</b> Funding provides for design, development, integration and test of platform improvements for Naval Undergraduate Flight Training Systems, which include T-45 Training System (TS), Joint Primary Aircraft Training System (T-6), TH-57 and T-44 aircraft.						
<b>FY 2019 Plans:</b> Continue studies & development efforts for platform improvements for Naval Undergraduate Flight Training Systems, including the system safety improvements to the T-6 for Crash Survivable Cockpit Voice Recorder (CSCVR) and Controlled Flight Into Terrain (CFIT) Avoidance.						
<b>FY 2020 Base Plans:</b> Continue studies & development efforts for platform improvements for Naval Undergraduate Flight Training Systems, including the system safety improvements to the T-6 for Crash Survivable Cockpit Voice Recorder (CSCVR) and Controlled Flight Into Terrain (CFIT) Avoidance, T-45 Digital Inline Timer development, T-45 Next Generation Strike Training Aircraft Analysis of Alternatives (AoA) and T-44 Fatigue Life Extension Study.						
<b>FY 2020 OCO Plans:</b>						

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Exhibit R-2A, RDT&E Project Justification: PB 2020 Navy			Date: March 2019			
Appropriation/Budget Activity 1319 / 5		R-1 Program Element (Number/Name) PE 0603208N / Training System Aircraft	Project (Number/Name) 3367 / Training Aircraft Updates			
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
N/A						
FY 2019 to FY 2020 Increase/Decrease Statement: The FY2020 funding request was increased by \$6.905M to support T-6 CSCVR and CFIT Validation and Verification for T-6 as well as the T-45 Digital Inline Timer development and T-45 Next Generation Strike Training Aircraft (AoA).						
Title: Naval Aviation Physiological Episode  Articles:  Description: Funding provides for design, development, integration and test of platform improvements for Naval Undergraduate Flight Training Systems to include Naval Aviation Physiological Episode (PE) Mitigation in the Training Aircrafts (T-45 and T-6).  FY 2019 Plans: Continue studies & development efforts for platform improvements for Naval Undergraduate Flight Training Systems, including T-45 Physiological Episode mitigation, and joint efforts with Air Force for Joint Primary Aircraft Training System (T-6).  FY 2020 Base Plans: Continue studies & development efforts as well as utilize associative learning 'artificial intelligence' platform to evaluate aircraft and maintenance data in support of PE root cause investigations for platform improvements for Naval Undergraduate Flight Training Systems, including T-45 Physiological Episode mitigation, and joint efforts with Air Force for Joint Primary Aircraft Training System (T-6).  FY 2020 OCO Plans: N/A  FY 2019 to FY 2020 Increase/Decrease Statement: The FY2020 funding request was increased by \$0.055M to support the incorporation of associative learning to platform improvements to the T-45 for Physiological Episode mitigation.		3.363 -	6.100 -	6.155 -	0.000 -	6.155 -
Title: T45 Required Avionics Sustainment Program (RASP)  Articles:  Description: Funding supports development, integration, test, and certification of the Automatic Dependent Surveillance-Broadcast (ADS-B) Out capability in the T-45 Training System to comply with the January 1, 2020 Federal Aviation Administration ADS-B Out mandate.		8.612 -	4.113 -	0.000 -	0.000 -	0.000 -

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Appropriation/Budget Activity 1319 / 5				R-1 Program Element (Number/Name) PE 0603208N / Training System Aircraft				Project (Number/Name) 3367 / Training Aircraft Updates			
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)						FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	
<b>FY 2019 Plans:</b> Test Readiness Review (TRR) is planned to complete Q2 FY 2019, Flight Readiness Review (FRR) is planned to complete in Q3 FY 2019 followed by the commencement of on-aircraft developmental test in support of certification in Q4 FY 2019.											
<b>FY 2020 Base Plans:</b> N/A											
<b>FY 2020 OCO Plans:</b> N/A											
<b>FY 2019 to FY 2020 Increase/Decrease Statement:</b> The FY2020 funding request was decreased by \$4.133M due to RASP program transitioning efforts to retrofit ADS-B Out capability into aircraft.											
<b>Title:</b> T6 A/B Communication and Navigation System/Air Traffic Management (CNS/ATM) <b>Articles:</b>						0.556 -	0.000 -	0.000 -	0.000 -	0.000 -	
<b>Description:</b> Funding supports development, integration, test, and certification of the Automatic Dependent Surveillance-Broadcast (ADS-B) Out capability in the T-6 A/B Training System to comply with the January 1, 2020 Federal Aviation Administration ADS-B Out mandate.											
<b>FY 2019 Plans:</b> N/A											
<b>FY 2020 Base Plans:</b> N/A											
<b>FY 2020 OCO Plans:</b> N/A											
Accomplishments/Planned Programs Subtotals						14.798	12.798	15.514	0.000	15.514	
C. Other Program Funding Summary (\$ in Millions)											
Line Item	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
• APN/0569: T45 Series	164.191	193.567	186.022	-	186.022	166.948	182.495	180.897	185.160	545.852	2,709.308

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2020 Navy								<b>Date:</b> March 2019			
<b>Appropriation/Budget Activity</b> 1319 / 5				<b>R-1 Program Element (Number/Name)</b> PE 0603208N / <i>Training System Aircraft</i>				<b>Project (Number/Name)</b> 3367 / <i>Training Aircraft Updates</i>			

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

<u>Line Item</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u> <u>Base</u>	<u>FY 2020</u> <u>OCO</u>	<u>FY 2020</u> <u>Total</u>	<u>FY 2021</u>	<u>FY 2022</u>	<u>FY 2023</u>	<u>FY 2024</u>	<u>Cost To</u> <u>Complete</u>	<u>Total Cost</u>
• APN/0571: <i>JT Primary Acft Trnr Sys (JPATS)</i>	24.907	26.470	21.824	-	21.824	28.367	31.242	31.422	32.163	19.909	253.452
• APN/0549: <i>Trainer Acft Series</i>	8.101	11.660	5.616	-	5.616	24.973	26.223	26.916	27.589	0.000	366.980
• APN/0344: <i>Advanced Helicopter Trainer System</i>	0.000	0.000	261.160	-	261.160	266.000	263.500	130.500	0.000	182.145	1,103.305

**Remarks**

**D. Acquisition Strategy**

T-45 Training System: Required Avionics Sustainment Program (RASP) Phase I is the first phase to equip the T-45 to operate in the Federal Aviation Administration's (FAA) Next Generation Air Transportation System (NextGen) airspace through the expected life of the T-45. The Research Development Test and Evaluation effort consists of a sole source Technology Maturation and Risk Reduction/ Engineering Manufacturing Development contract effort that awarded in FY 2016. Replacement kits for the Weapon Replaceable Assemblies (WRA) associated with the Automatic Dependent Surveillance-Broadcast (ADS-B) Out capability will be contracted through the Lead Systems Integrator for the Engineering Manufacturing Development phase through Test and Validation/Verification.

T6 Communication, Navigation, System/Air Traffic Management (CNS/ATM) and Avionics Upgrades for FAA Compliance are outside of the Joint Primary Aircraft Training System (JPATS) Major Defense Acquisition Program (MDAP) and will be established as a new Joint Acquisition Program with the United States Air Force. For the JPATS Avionics Upgrade for FAA Compliance effort, a competitive award will be the strategy for the T-6A air vehicles due to their federated design. The Navy is the lead for T-6B acquisition efforts and a sole-source strategy will be sought for the T-6B air vehicles due to proprietary hardware and software. Avionics in the T-6B are of an integrated design with proprietary hardware and software controlling input and output of navigation, communications, air data and other avionics information through an Integrated Avionics Computer (IAC). The CNS/ATM mandate requires integration into these systems in order to meet FAA Advisory Circular 20-165A Automatic Dependent Surveillance-Broadcast (ADS-B) Out system requirements and user capability requirements for flying in national airspace by 2020. Specifically, transponder and Global Positioning System (GPS) information that the ADS-B functions rely on are processed through proprietary software written to integrate with proprietary hardware designed by the same avionics manufacturer. A sole-source approach has been selected because the government does not own or have access to proprietary data to support development of hardware or software required to integrate ADS-B into the aircraft. System Safety Improvement research, design and development will allow the T-6 to remain a viable aircraft for training the Fleet.

The TH-57 Follow-On Training System effort will be established to determine and implement the most cost efficient and effective path forward for providing Rotary Wing Naval Aviators to the Fleet Replacement Squadrons. The acquisition strategy includes three separate contract actions: 1) direct procurement of a new commercial off-the-shelf training helicopter and required spare parts, 2) a single Contract Logistics Services contract for AHTS and TH-57 sundown, and 3) contractor owned, contractor operated Ground Based Training Systems housed in Government facilities.

Training System Improvements: Efforts under this category are expected to be limited to those efforts meeting thresholds under the abbreviated acquisition category.



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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2020 Navy		<b>Date:</b> March 2019
<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0603208N / <i>Training System Aircraft</i>	<b>Project (Number/Name)</b> 3367 / <i>Training Aircraft Updates</i>
<b>E. Performance Metrics</b> <p>T-45 Training System: Performance of the program will be measured via the Acquisition and Systems Engineering Technical Review (SETR) Process. Critical Design Review (CDR) is planned for 1st quarter FY 2018 with Flight Readiness Review (FRR) planned for 1st quarter FY 2019.</p> <p>T-6 Joint Primary Aircraft Training System (JPATS): For T-6B National Airspace Compliance is an Abbreviated Acquisition Program with Acquisition Milestones utilizing systems engineering processes. Other system safety improvements will allow the T-6 to maintain Joint requirements.</p> <p>TH-57 Follow-On Training System: The follow-on system to the TH-57 will be a new Major Defense Acquisition Program (MDAP) with Acquisition Milestones utilizing the systems engineering processes. The follow-on system to the TH-57 is being recommended for designation as a Middle-Tier, Pilot Rapid Acquisition Program entering post-Milestone C to Full Rate Production. Otherwise, the procurement will be a CAT II Acquisition.</p>		

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy** **Date:** March 2019

<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0603208N / <i>Training System Aircraft</i>	<b>Project (Number/Name)</b> 3367 / <i>Training Aircraft Updates</i>
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Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
T45 Product Development Cost	SS/CPFF	Boeing : St. Louis, MO	14.575	5.342	Jul 2018	0.000		0.000		-		0.000	0.000	19.917	19.917
T45 PE Product Development Cost	C/CPFF	Various : Various	0.898	0.000		0.000		0.000		-		0.000	0.000	0.898	0.898
Training System Improvement T6 CSCVR	TBD	TBD : TBD	0.000	0.000		0.000		3.000	Feb 2020	-		3.000	0.400	3.400	3.400
Training System Improvement T6 CFIT	TBD	TBD : TBD	0.000	0.000		0.000		1.200	Feb 2020	-		1.200	1.200	2.400	2.400
Training System Improvement T45 Digital Inline Timer	TBD	TBD : TBD	0.000	0.000		0.000		1.000	Jan 2020	-		1.000	1.200	2.200	2.200
Training System Improvement T45 Next Gen Strike Training Aircraft AoA	TBD	TBD : TBD	0.000	0.000		0.000		1.545	Dec 2019	-		1.545	2.500	4.045	4.045
Prior Year Product Development costs no longer in the FYDP	Various	Various : Various	4.202	0.000		0.000		0.000		-		0.000	0.000	4.202	4.202
<b>Subtotal</b>			19.675	5.342		0.000		6.745		-		6.745	5.300	37.062	N/A

**Remarks**

Training System Improvements T6: FY2020 Development Costs support T-6 CSCVR Validation and Verification.  
 Training System Improvements T6: FY2020 Development Costs support T-6 CFIT Validation and Verification.  
 Training System Improvements T45: FY2020 Development Costs support T-45 Digital Inline Timer development efforts.  
 Training System Improvements T45: FY2020 Development Costs support T-45 Next Gen Strike Training Aircraft AoA.

Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
T45 Systems Engineering Support - EMD	WR	NAWCAD : Patuxent River, MD	6.020	0.705	Nov 2017	0.865	Nov 2018	0.000		-		0.000	0.000	7.590	-
T45 Integrated Logistics Support	WR	NAWCAD : Patuxent River, MD	1.898	0.214	Nov 2017	0.393	Nov 2018	0.000		-		0.000	0.000	2.505	-

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Appropriation/Budget Activity 1319 / 5						R-1 Program Element (Number/Name) PE 0603208N / Training System Aircraft				Project (Number/Name) 3367 / Training Aircraft Updates					
Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
T45 Engineering Study	SS/BOA	JHU : Laurel, MD	0.833	1.329	Sep 2018	0.000		0.000		-		0.000	0.000	2.162	2.162
T6 Systems Engineering Support	WR	NAWCAD : Patuxent River, MD	1.849	0.367	Mar 2018	0.000		0.000		-		0.000	2.400	4.616	-
T6 Systems Engineering Support	WR	NADEP : Jacksonville, FL	0.263	0.250	Jan 2018	0.000		0.000		-		0.000	0.000	0.513	-
TH-57 Follow-On Training System Engineering Support	WR	Various : Various	0.000	2.116	Nov 2017	2.431	Nov 2018	2.300	Nov 2019	-		2.300	0.377	7.224	-
T45 PE Support	WR	Various : Various	1.250	0.500	Aug 2018	3.250	Aug 2019	2.450	Aug 2020	-		2.450	0.000	7.450	-
T6 PE Support	WR	AFRL RH : Wright Patterson AFB, OH	0.000	0.161	Jun 2018	1.000	Nov 2018	1.100	Nov 2019	-		1.100	0.000	2.261	-
Training System Improvement T-6 Joint Study Efforts	MIPR	AFRL : Wright-Patterson AFB	0.104	0.030	Nov 2017	0.069	Nov 2018	0.086	Nov 2019	-		0.086	3.200	3.489	-
Training System Improvement T-45 Real-time Air Quality Sensor (RTAQS) Study	MIPR	AFRL RH : Wright Patterson AFB, OH	0.328	0.557	Jul 2018	0.500	Jul 2019	0.550	Jul 2020	-		0.550	0.000	1.935	-
Training System Improvement T-44 Fatigue Life Extension Study	WR	NADEP : Jacksonville, FL	0.000	0.000		0.000		0.163	Nov 2019	-		0.163	5.000	5.163	-
Prior Year Support costs no longer funded in FYDP	Various	Various : Various	4.410	0.000		0.000		0.000		-		0.000	0.000	4.410	-
Subtotal			16.955	6.229		8.508		6.649		-		6.649	10.977	49.318	N/A
Remarks															
T45 and T-6 PE Support: Cost category added for T-45 and T-6 Physiological Episodes (PE) support															
TH-57 Follow-On Training System Engineering Support: Cost category added for Advanced Helicopter Systems Engineering Support.															
Training System Improvement: Cost category added for T-44 Fatigue Life Extension Study.															

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Appropriation/Budget Activity 1319 / 5						R-1 Program Element (Number/Name) PE 0603208N / <i>Training System Aircraft</i>				Project (Number/Name) 3367 / <i>Training Aircraft Updates</i>					
Test and Evaluation (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
T45 Test & Certification	WR	NAWCAD : Patuxent River, MD	2.218	0.600	Nov 2017	0.845	Nov 2018	0.000		-		0.000	0.000	3.663	-
T6 Test and Evaluation	C/CPFF	Textron Aircraft Defense : Wichita, KS	0.177	0.000		0.000		0.000		-		0.000	0.000	0.177	0.177
Subtotal			2.395	0.600		0.845		0.000		-		0.000	0.000	3.840	N/A
Management Services (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
T45 Project Management	Various	Various : Various	1.557	0.759	Nov 2017	0.836	Nov 2018	0.000		-		0.000	0.000	3.152	-
T-45 Test Wing Maintenance	C/FFP	L-3 : Patuxent River, MD	2.521	1.627	Oct 2017	2.237	Oct 2018	2.000	Oct 2019	-		2.000	3.200	11.585	11.585
T45 PBTH Flight Hours	C/FFP	Rolls Royce : Indianapolis, IN	0.179	0.089	May 2018	0.257	May 2019	0.000		-		0.000	0.000	0.525	0.525
T45 Travel	Various	NAVAIR : Patuxent River, MD	0.075	0.093	Oct 2017	0.055	Oct 2018	0.055	Oct 2019	-		0.055	0.110	0.388	-
T6 Travel	Various	NAVAIR : Patuxent River, MD	0.149	0.030	Oct 2017	0.030	Oct 2018	0.035	Oct 2019	-		0.035	0.090	0.334	-
TH57 Travel	Various	Various : Various	0.033	0.029	Oct 2017	0.030	Oct 2018	0.030	Oct 2019	-		0.030	0.090	0.212	-
Prior Year Mgmt costs no longer funded in FYDP	Various	Various : Various	3.504	0.000		0.000		0.000		-		0.000	0.000	3.504	-
Subtotal			8.018	2.627		3.445		2.120		-		2.120	3.490	19.700	N/A
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			47.043	14.798		12.798		15.514		-		15.514	19.767	109.920	N/A
Remarks															

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<b>Exhibit R-4, RDT&amp;E Schedule Profile:</b> PB 2020 Navy	<b>Date:</b> March 2019
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<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0603208N / <i>Training System Aircraft</i>	<b>Project (Number/Name)</b> 3367 / <i>Training Aircraft Updates</i>
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T45 RASP	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
<b>System Development</b>																												
Hardware Development	T45 HW																											
<b>Reviews</b>																												
		T45 CDR ■																										
<b>Test &amp; Evaluation</b>																												
Technical Evaluation							T45 IT&E																					
<b>Contract Awards</b>																												
<b>Deliveries</b>																												
Lab Assets		T45 Lab Assests QTY 8																										
Test Assets			T45 Test Assests QTY 6																									

2020PB - 0603208N - 3367

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PE 0603208N: *Training System Aircraft*  
Navy

R-1 Line #96

**Appropriation/Budget Activity**  
1319 / 5

**R-1 Program Element (Number/Name)**  
PE 0603208N / *Training System Aircraft*

**Project (Number/Name)**  
3367 / Training Aircraft Updates

[illegible]

2020PB - 0603208N - 3367 Automatic Dependent Surveillance-Broadcast (ADS-B). T-6A ADS-B Development is Air Force led. T-6B ADS-B Development is Navy led. Reviews, T&E & Test Assets listed reflect T-6B Development efforts.

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PE 0603208N: *Training System Aircraft*  
Navy

R-1 Line #96

[illegible]

PE 0603208N / Training System Aircraft

3367 / Training Aircraft Updates

[illegible]

2020PB - 0603208N - 3367

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

Date: March 2019

Appropriation/Budget Activity

1319 / 5

R-1 Program Element (Number/Name)

PE 0603208N / Training System Aircraft

Project (Number/Name)

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Training System Improvements	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
System Development	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
	Training System Improvements Development																											
Study/Analysis/Support																												
T-6 Joint Study Efforts	T-6 Joint Study Efforts																											
T-45 VMTS Throttle Grip Engineering Analysis	T-45 VMTS Throttle Grip Engineering Analysis																											
T-45 Real-time Air Quality Test Sensor Study	T-45 Real-time Air Quality Test Sensor Study																											
T-45 Analysis of Alternatives	T-45 Analysis of Alternatives																											
T6 Crash Survivable Cockpit Voice Recorder (CSCVR)																												
T6 Controlled Flight Into Terrain (CFIT) Avoidance																												
T-45 (TS) Digital Inline Timer Development																												
T-45 Next Gen Strike Training Aircraft AOA																												
T-44 Fatigue Life Extension Study																												

2020PB - 0603208N - 3367



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Navy

R-1 Line #96

R-1 Program Element (Number/Name)	Program Element Description	Program Element Status	Program Element Comments

PE 0603208N / Training System Aircraft

3367 / Training Aircraft Updates

1319 / 5

Naval Aviation Physiological Episodes					FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024											
					1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q								
System Development																																								
					T-45 PE					T-45 Test and Evaluation																														
										T-45 PE Support																														
					T6 PE Test & Evaluation					T-6B Test and Evaluation																														
T-6B PE Support																																								

2020PB - 0603208N - 3367

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2020 Navy			<b>Date:</b> March 2019
<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0603208N / <i>Training System Aircraft</i>	<b>Project (Number/Name)</b> 3367 / <i>Training Aircraft Updates</i>	

**Schedule Details**

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b><i>T45 RASP</i></b>				
System Development: Hardware Development: T45 Hardware Development	1	2018	1	2019
Reviews: T45 Critical Design Review	2	2018	2	2018
Test & Evaluation: Technical Evaluation: T45 Integrated Test & Evaluation	2	2019	3	2019
Deliveries: Lab Assets: T45 Lab Assets	2	2018	3	2018
Deliveries: Test Assets: T45 Test Assets	3	2018	3	2019
<b><i>T6 A/B CNS/ATM</i></b>				
Acquisition Milestones: Initial Operational Capability	2	2019	2	2019
Acquisition Milestones: Full Operational Capability	4	2019	4	2019
System Development: T-6A ADS-B Development (USAF Lead): T-6A ADS-B Development	1	2018	4	2018
<b><i>TH-57 Follow-On Training System</i></b>				
System Development: Follow-On Training System Development	1	2018	2	2020
System Engineering: Follow-On Training System Requirements Development	1	2018	2	2020
<b><i>Training System Improvements</i></b>				
System Development: Training System Improvements Development	1	2018	4	2024
Study/Analysis/Support: T-6 Joint Study Efforts: T-6 Joint Study Efforts	1	2018	4	2020
Study/Analysis/Support: T-45 VMTS Throttle Grip Engineering Analysis: T-45 VMTS Throttle Grip Engineering Analysis	1	2018	2	2018
Study/Analysis/Support: T-45 Real-time Air Quality Test Sensor Study: T-45 Real-time Air Quality Test Sensor Study	1	2018	4	2021
Study/Analysis/Support: T-45 Analysis of Alternatives: T-45 Analysis of Alternatives	1	2018	4	2018
Study/Analysis/Support: T6 Crash Survivable Cockpit Voice Recorder (CSCVR): T6 Crash Survivable Cockpit Voice Recorder (CSCVR)	2	2020	4	2021

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy			Date: March 2019	
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0603208N / Training System Aircraft		Project (Number/Name) 3367 / Training Aircraft Updates	
	Start		End	
Events by Sub Project	Quarter	Year	Quarter	Year
Study/Analysis/Support: T6 Crash Survivable Cockpit Voice Recorder (CSCVR): T6 CSCVR Hardware Test	4	2020	4	2020
Study/Analysis/Support: T6 Controlled Flight Into Terrain (CFIT) Avoidance: T6 Controlled Flight Into Terrain (CFIT) Avoidance	2	2020	4	2021
Study/Analysis/Support: T6 Controlled Flight Into Terrain (CFIT) Avoidance: T6 CFIT Hardware Test	1	2021	1	2021
Study/Analysis/Support: T-45 (TS) Digital Inline Timer Development: T-45 (TS) Digital Inline Timer Development	2	2020	2	2021
Study/Analysis/Support: T-45 Next Gen Strike Training Aircraft AOA: T-45 Next Gen Strike Training Aircraft Analysis of Alternatives	1	2020	1	2021
Study/Analysis/Support: T-44 Fatigue Life Extension Study: T-44 Fatigue Life Extension Study	4	2019	1	2021
Naval Aviation Physiological Episodes				
System Development: T-45 PE: T-45 Acceptance Test	1	2018	4	2024
System Development: T-45 PE: T-45 PE Support	1	2018	4	2020
System Development: T6 PE Test & Evaluation: T6 Acceptance Test	1	2018	4	2024
System Development: T6 PE Test & Evaluation: T-6B PE Support	3	2018	4	2022

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2020 Navy										<b>Date:</b> March 2019		
<b>Appropriation/Budget Activity</b> 1319 / 5					<b>R-1 Program Element (Number/Name)</b> PE 0603208N / <i>Training System Aircraft</i>				<b>Project (Number/Name)</b> 9999 / <i>Congressional Adds</i>			
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020 Base</b>	<b>FY 2020 OCO</b>	<b>FY 2020 Total</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
9999: <i>Congressional Adds</i>	0.000	1.545	0.000	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	1.545
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

**A. Mission Description and Budget Item Justification**  
 Congressional Add.  
  
 T-45 Physiological Episode (PE) mitigation studies and development efforts.

<b><u>B. Accomplishments/Planned Programs (\$ in Millions)</u></b>	<b>FY 2018</b>	<b>FY 2019</b>
<b><i>Congressional Add:</i></b> T-45 and F/A-18 Physiological Episodes	1.545	0.000
<b><i>FY 2018 Accomplishments:</i></b> N/A		
<b><i>FY 2019 Plans:</i></b> N/A		
<b>Congressional Adds Subtotals</b>	1.545	0.000

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

**Remarks**

**D. Acquisition Strategy**  
 Not Required for Congressional Adds.

**E. Performance Metrics**  
 Not Required for Congressional Adds.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Navy** **Date:** March 2019

<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0603208N / <i>Training System Aircraft</i>	<b>Project (Number/Name)</b> 9999 / <i>Congressional Adds</i>
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Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
T-45 PE Mitigation (HMAPS)	C/CPFF	Athena GTX INC. : Des Moines, IA	0.000	0.750	Aug 2018	0.000		0.000		-		0.000	0.000	0.750	0.750
T-45 PE Mitigation (JHU/APL)	C/CPFF	NAVSEA : JHU/APL	0.000	0.785	Jan 2019	0.000		0.000		-		0.000	0.000	0.785	0.785
<b>Subtotal</b>			0.000	1.535		0.000		0.000		-		0.000	0.000	1.535	N/A

**Remarks**

T45 PE: FY2018 Development Costs support Holistic Modular Aircrew Physiologic Status (HMAPS) Monitoring System Development.  
T45 PE: FY2018 Development Costs support PE Mitigation efforts

Support (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 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
T-45 PE Mitigation Support	WR	NAWCAD : Patuxent River, MD	0.000	0.010	Aug 2018	0.000		0.000		-		0.000	0.000	0.010	-
<b>Subtotal</b>			0.000	0.010		0.000		0.000		-		0.000	0.000	0.010	N/A
<b>Project Cost Totals</b>			0.000	1.545		0.000		0.000		-		0.000	0.000	1.545	N/A

**Remarks**

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PE 0603208N: *Training System Aircraft*  
Navy

R-1 Line #96

Project (Number/Name)  
9999 / Congressional Adds

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2020DON - 0603208N - 9999

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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Navy		Date: March 2019
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0603208N / Training System Aircraft	Project (Number/Name) 9999 / Congressional Adds

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>T-45 PE Mitigation</b>				
System Development: T-45 PE Mitigation Studies and Development efforts	4	2018	4	2019