Exhibit R-2, RDT&E Budget Item Justification: PB 2016 Navy											Date: February 2015	
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*					R-1 Program Element (Number/Name) PE 0603208N *I Training System Aircraft*							
COST ($ in Millions)	**Prior Years**	**FY 2014**	**FY 2015**	**FY 2016 Base**	**FY 2016 OCO**	**FY 2016 Total**	**FY 2017**	**FY 2018**	**FY 2019**	**FY 2020**	**Cost To Complete**	**Total Cost**
Total Program Element	0.000	-	25.153	21.708	-	21.708	17.814	17.918	2.954	3.030	-	88.577
3367: *Training Aircraft Updates*	0.000	-	25.153	21.708	-	21.708	17.814	17.918	2.954	3.030	-	88.577

Note

The Federal Aviation Administration (FAA) has developed a plan to modernize the National Airspace System (NAS) in order to address the impact of air traffic growth in the United States. This multi-phase plan, called Next Generation Air Transportation System (NextGen) is intended to increase the air traffic capacity while at the same time improving safety and efficiency. In part, NextGen implements a capability called Performance Based Navigation (PBN) in which the aircraft's navigation performance capability will be a determining factor as to whether or not it can fly within specific airspace, certain air traffic routes or instrument procedures. Also, NextGen transforms the NAS from a radar based system, with aircraft interrogation, to a satellite based system utilizing Automatic Dependent Surveillance-Broadcast (ADS-B Out) communication in order to transmit the aircraft's own position to the controllers and other ADS-B in capable aircraft. PBN is an enabler for ADS-B functionality.

On May 28th, 2010 the FAA released DoT/FAA, 14 CFR Part 91: Automatic Dependent Surveillance-Broadcast (ADS-B) Out Performance Requirements To Support Air Traffic Control (ATC) Service Final Rule. This mandate stipulated that all aircraft required to have unrestricted access to operate in Classes A, B, and C airspace, certain Class E airspace, and other specified airspace requiring ADS-B Out, must be in compliance with this regulation by January 1, 2020.

A. Mission Description and Budget Item Justification

The T-45 Training System (TS) Required Avionics Sustainment Program (RASP) Phase I (ADS-B Out):
In order for the T-45TS to continue to have unrestricted access to the NAS through its projected end of service life, 2035, and avoid impacts to Chief of Naval Air Training (CNATRA) Strike Pilot and Naval Flight Officer (NFO) training, the T-45TS must develop, test, and integrate the RASP Phase I ADS-B Out capability. This research and development effort will be an ACAT III program and consists of the minimum required capability increase necessary for ADS-B Out, enabling 197 aircraft and 18 simulators to meet the January 1, 2020 FAA ADS-B Out mandate. Specifically, this includes the development, integration, test and certification of the replacement for the APX-100 Transponder (with associated control panel, personality module, and data bus connectivity), the replacement of the Air Data Computer (ADC), and the integration of these components with the modified Global Position System/Inertial Navigation Assembly (GINA), antennas, and Mission Display Processor Operational Flight Program (MDP/OFP) software.

The T-6 Joint Primary Aircraft Training System (JPATS) Communication and Navigation System/Air Traffic Management (CNS/ATM):
JPATS is a joint United States Navy (USN)/United States Air Force (USAF) Acquisition Program designed to replace the aging primary aircraft (T-34/T-37) fleet. Principle JPATS mission is primary training for entry-level Navy/Air Force student pilots, associated instructor pilots, and primary/intermediate training for USN NFOs. JPATS includes the T-6 Texan II which is a stepped tandem seat, commercially derived aircraft powered by a single Pratt & Whitney PT6A-68 turboprop engine. It serves as the aircraft component of the JPATS integrated primary pilot training system which replaces the T-34C primary training aircraft. In order for the T-6 A&B training aircraft to continue to have unrestricted access to the NAS through its projected end of service life and avoid impacts to CNATRA primary entry-level student pilots and NFO training, the T-6 program must develop, integrate, test and certify ADS-B Out capability for both the A&B models. This R&D effort will consist of

Exhibit R-2, RDT&E Budget Item Justification: PB 2016 Navy	Date: February 2015
Appropriation/Budget Activity 1319: *Research, Development, Test & Evaluation, Navy I* BA 5: *System Development & Demonstration (SDD)*	**R-1 Program Element (Number/Name)** PE 0603208N *I Training System Aircraft*

the minimum required capability increase necessary for ADS-B Out, enabling 295 aircraft and 29 simulators to meet the January 1, 2020 FAA mandate. This effort specifically includes development, integration, test and certification.

This program is funded under SYSTEM DEVELOPMENT AND DEMONSTRATION because it includes those projects that have passed Milestone B approval and are conducting engineering and manufacturing development tasks aimed at meeting validated requirement prior to full-rate production decision.

B. Program Change Summary ($ in Millions)	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
Previous President's Budget	-	25.153	21.884	-	21.884
Current President's Budget	-	25.153	21.708	-	21.708
Total Adjustments	-	-	-0.176	-	-0.176
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program Adjustments	-	-	-	-	-
• Rate/Misc Adjustments	-	-	-0.176	-	-0.176

Change Summary Explanation

T-45 updates reflect changes based on engineering study conducted which indicated that replacing the GINA would be cost-prohibitive but that IFF antenna replacements would not be required; we could use the existing aircraft antenna. The existing GINA and antenna wiring will be modified and will therefore be funded with APN-5. The study also indicated the necessity of replacing the Air Data Computer to ensure sufficient altitude accuracy, which will need to be developed for use in the T-45 and has been added to this effort. Test and Certification omission was also corrected. Milestones B and C shifted to reflect current Integrated Master Schedule (IMS).

Exhibit R-2A, RDT&E Project Justification: PB 2016 Navy			Date: February 2015
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 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
3367: *Training Aircraft Updates*	-	-	25.153	21.708	-	21.708	17.814	17.918	2.954	3.030	-	88.577
Quantity of RDT&E Articles		-	-	14	-	14	-	-	-	-		

A. Mission Description and Budget Item Justification

The Federal Aviation Administration (FAA) has developed a plan to modernize the National Airspace System (NAS) in order to address the impact of air traffic growth in the United States. This multi-phase plan, called Next Generation Air Transportation System (NextGen), is intended to increase the air traffic capacity while at the same time improving safety and efficiency. In part, NextGen implements a capability called Performance Based Navigation (PBN) in which the aircraft's navigation performance capability will be a determining factor as to whether or not it can fly within specific airspace, certain air traffic routes or instrument procedures. Also, NextGen transforms the NAS from a radar based system, with aircraft interrogation, to a satellite based system utilizing Automatic Dependent Surveillance-Broadcast (ADS-B Out) communication in order to transmit the aircraft's own position to the controllers and other ADS-B In capable aircraft.

On May 28th, 2010 the FAA released DoT/FAA, 14 CFR Part 91: Automatic Dependent Surveillance-Broadcast (ADS-B) Out Performance Requirements To Support Air Traffic Control (ATC) Service Final Rule. This mandate stipulated that all aircraft required to have unrestricted access to operate in Classes A, B, and C airspace, certain Class E airspace, and other specified airspace requiring ADS-B Out, must be in compliance with this regulation by January 1, 2020.

B. Accomplishments/Planned Programs ($ in Millions, Article Quantities in Each)	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
Title: T45 RASP	-	5.478	15.083	-	15.083
Articles:	-	-	14	-	14
Description: Funding supports development, integration, test, and certification of the ADS-B Out capability in the T-45 Training System to comply with the January 1, 2020 FAA ADS-B Out mandate.					
FY 2014 Accomplishments: N/A					
FY 2015 Plans: T-45 Training System: Begin design and integration of Required Avionics Sustainment Program (RASP) Phase I into the T-45 by providing manpower to support an ACAT III Program of Record pre-Milestone B in FY15. Activities to begin in FY15 include: contract efforts to support the FY15 award of the Engineering Manufacturing Development (EMD) contract; the development, replacement, and integration of the transponder (with associated control panel, personality module, and data bus connectivity), and the Air Data Computer (ADC); and the integration of these components with the modified Global Position System/Inertial Navigation Assembly (GINA), antennas, and Mission Display Processor Operational Flight Program (MDP/OFP) software.					
FY 2016 Base Plans:					

Exhibit R-2A, RDT&E Project Justification: PB 2016 Navy		Date: February 2015
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 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
Continue the design and integration of the Automatic Dependent Surveillance - Broadcast (ADS-B (Out)) solution in the T-45 that will include the replacements to the transponder (with associated control panel, personality module, and data bus connectivity), the Air Data Computer (ADC), and the integration of these components with the modified Global Position System/Inertial Navigation Assembly (GINA), antennas, and Mission Display Processor Operational Flight Program (MDP/OFP) software. Continuation of the Engineering Manufacturing Development (EMD) contract for this ACAT III program to support Milestone B in FY 2017 and the certification process. To allow for sufficient lead time, 4 transponder kits and 4 ADC articles will be purchased to support laboratory integration testing, and 3 transponder kits and 3 ADC articles will be purchased to support aircraft test in FY 2017; for a total of 14 RDT&E,N articles. ***FY 2016 OCO Plans:*** N/A					
Title: T6 A/B CNS/ATM	-	19.675	6.625	-	6.625
Articles:	-	-	-	-	-
Description: Funding supports development, integration, test, and certification of the ADS-B Out capability in the T-6 A/B Training System to comply with the January 1, 2020 FAA ADS-B Out mandate. ***FY 2014 Accomplishments:*** N/A ***FY 2015 Plans:*** T-6 JPATS: Significant non-recurring engineering and qualification/certification of new equipment, corresponding ground based training systems and technical documentation for upgrade current instruments and associated components that do not support ADS-B Out capability. Activities to be conducted during FY15 include: Receipt of RFP responses, prime contractor proposal evaluations and discussions through contract award, and all major engineering design and development efforts through Preliminary Design Review (PDR). ***FY 2016 Base Plans:*** T-6 JPATS: Continue non-recurring engineering and qualification/certification of equipment, corresponding ground based training system and technical documentation for upgrading current instruments and associated components that do not support ADS-B Out. FY 2016 efforts will include design refinement from PDR through CDR, establishment of the configuration baseline and initial system demonstration. ***FY 2016 OCO Plans:***					

Exhibit R-2A, RDT&E Project Justification: PB 2016 Navy		Date: February 2015
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 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
N/A					
Accomplishments/Planned Programs Subtotals	-	25.153	21.708	-	21.708

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
• APN/0569: *T45 Series (OSIP 006-16)*	-	-	13.273	-	13.273	27.274	39.993	65.992	55.467	47.523	249.522
• APN/0571: *JT Primary Acft Trnr Sys (JPATS) (OSIP 007-16)*	-	-	5.943	-	5.943	9.530	16.651	25.250	14.864	-	72.238

Remarks

D. Acquisition Strategy

T-45 Training System: Required Avionics Sustainment Program (RASP) Phase I is the first phase of an ACAT III Program of Record to allow the T-45 to operate in the Federal Aviation Administration's (FAA) NextGen through 2035, the expected life of the T-45. The RDT&E effort will consist of a sole source Engineering & Manufacturing Development (EMD) contract effort to be awarded in FY 2015. 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 EMD 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 JPATS Major Defense Acquisition Program and will be established as a new Joint Acquisition Program with the 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. 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 ADS-B Out system requirements and user capability requirements for flying in national airspace in 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.

E. Performance Metrics

T-45 Training System: Performance of the program will be measured via the Acquisition and Systems Engineering Technical Review (SETR) Process for an ACAT III program. Milestone B is planned for 1st quarter FY 2017 with Milestone C planned for 2nd quarter FY 2018.

Exhibit R-2A, RDT&E Project Justification: PB 2016 Navy		Date: February 2015
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0603208N / *Training System Aircraft*	**Project (Number/Name)** 3367 / *Training Aircraft Updates*

T-6 JPATS: National Airspace Compliance is planned to be a new ACAT III program with Acquisition Milestones utilizing systems engineering processes. Milestone B is planned for 1st quarter FY 2016 with Milestone C planned for 1st quarter FY 2017.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2016 Navy			Date: February 2015
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0603208N / *Training System Aircraft*	Project (Number/Name) 3367 / *Training Aircraft Updates*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Production Development Cost T45	SS/CPFF	Boeing : St. Louis, MO	0.000	-		2.494	Aug 2015	8.200	Nov 2015	-		8.200	16.416	27.110	27.110
Production Development Cost T6	TBD	TBD : TBD	0.000	-		18.836	May 2015	3.545	May 2016	-		3.545	-	22.381	22.381
		Subtotal	0.000	-		21.330		11.745		-		11.745	16.416	49.491	49.491

Remarks

Increase in T45 contract amount due to addition of Air Data Computer (ADC) development effort.

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Systems Engineering Support - EMD T45	WR	NAWCAD : Patuxent River, MD	0.000	-		1.840	Jan 2015	2.426	Nov 2015	-		2.426	8.767	13.033	-
Systems Engineering Support - T6	WR	NAWCAD : Patuxent River, MD	0.000	-		-		0.425	Jan 2016	-		0.425	-	0.425	-
Integrated Logistics Support - T45	WR	NAWCAD : Patuxent River, MD	0.000	-		0.650	Jan 2015	1.498	Nov 2015	-		1.498	5.473	7.621	-
Systems Engineering Support - T6	WR	NADEP : Jacksonville, FL	0.000	-		-		1.075	Dec 2015	-		1.075	-	1.075	-
Engineering Study - T45	SS/BOA	JHU : Laurel, MD	0.000	-		0.300	Jan 2015	-		-		-	1.400	1.700	1.700
Integrated Logistics Support - T6	WR	NAWCAD : Patuxent River, MD	0.000	-		-		0.500	Dec 2015	-		0.500	-	0.500	-
DT&E - T6	WR	NAWCAD : Patuxent River, MD	0.000	-		-		0.200	Dec 2015	-		0.200	-	0.200	-
		Subtotal	0.000	-		2.790		6.124		-		6.124	15.640	24.554	-

Remarks

Removed China Lake and Orlando TSD Systems Engineering Support because efforts are funded by APN-5.
Patuxent River System Engineering Support increased to account for TEMP development in FY 2015 and Systems Engineering Technical Review (SETR) events in FY 2016.
ILS funding increased to support creation of additional logistics documentation.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2016 Navy			Date: February 2015
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0603208N / *Training System Aircraft*	Project (Number/Name) 3367 / *Training Aircraft Updates*	

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Test & Certification - T45	WR	NAWCAD : Patuxent River, MD	0.000	-		-		1.200	Nov 2015	-		1.200	4.426	5.626	-
		Subtotal	0.000	-		-		1.200		-		1.200	4.426	5.626	-

Remarks

Test & Certification line inadvertently omitted in previous budget submits.

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
T45 Travel	Various	NAVAIR : Patuxent River, MD	0.000	-		0.194	Jan 2015	0.459	Oct 2015	-		0.459	1.444	2.097	-
T6 Program Management	Various	Various : Various	0.000	-		0.794	Jan 2015	0.794	Nov 2015	-		0.794	-	1.588	-
T6 Travel	Various	NAVAIR : Patuxent River, MD	0.000	-		0.045	Jan 2015	0.086	Oct 2015	-		0.086	-	0.131	-
T45 Program Management	Various	Various : Various	0.000	-		-		1.300	Oct 2015	-		1.300	3.790	5.090	-
		Subtotal	0.000	-		1.033		2.639		-		2.639	5.234	8.906	-

Remarks

Travel increased due to participation in subcontractor SETR events.

	Prior Years	FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	-		25.153		21.708		-		21.708	41.716	88.577	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2016 Navy		Date: February 2015
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0603208N / *Training System Aircraft*	**Project (Number/Name)** 3367 / *Training Aircraft Updates*

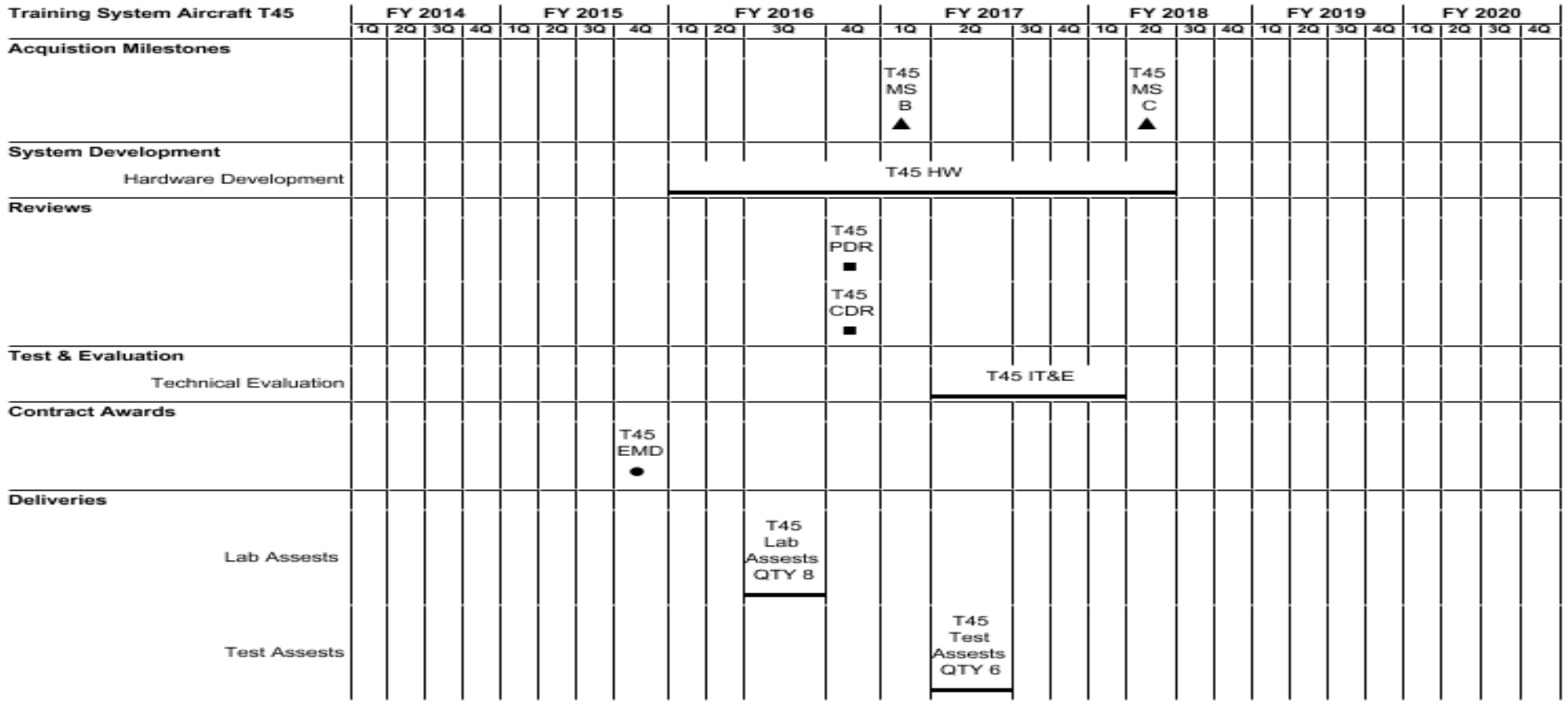

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Exhibit R-4, RDT&E Schedule Profile: PB 2016 Navy		Date: February 2015
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0603208N / *Training System Aircraft*	**Project (Number/Name)** 3367 / *Training Aircraft Updates*

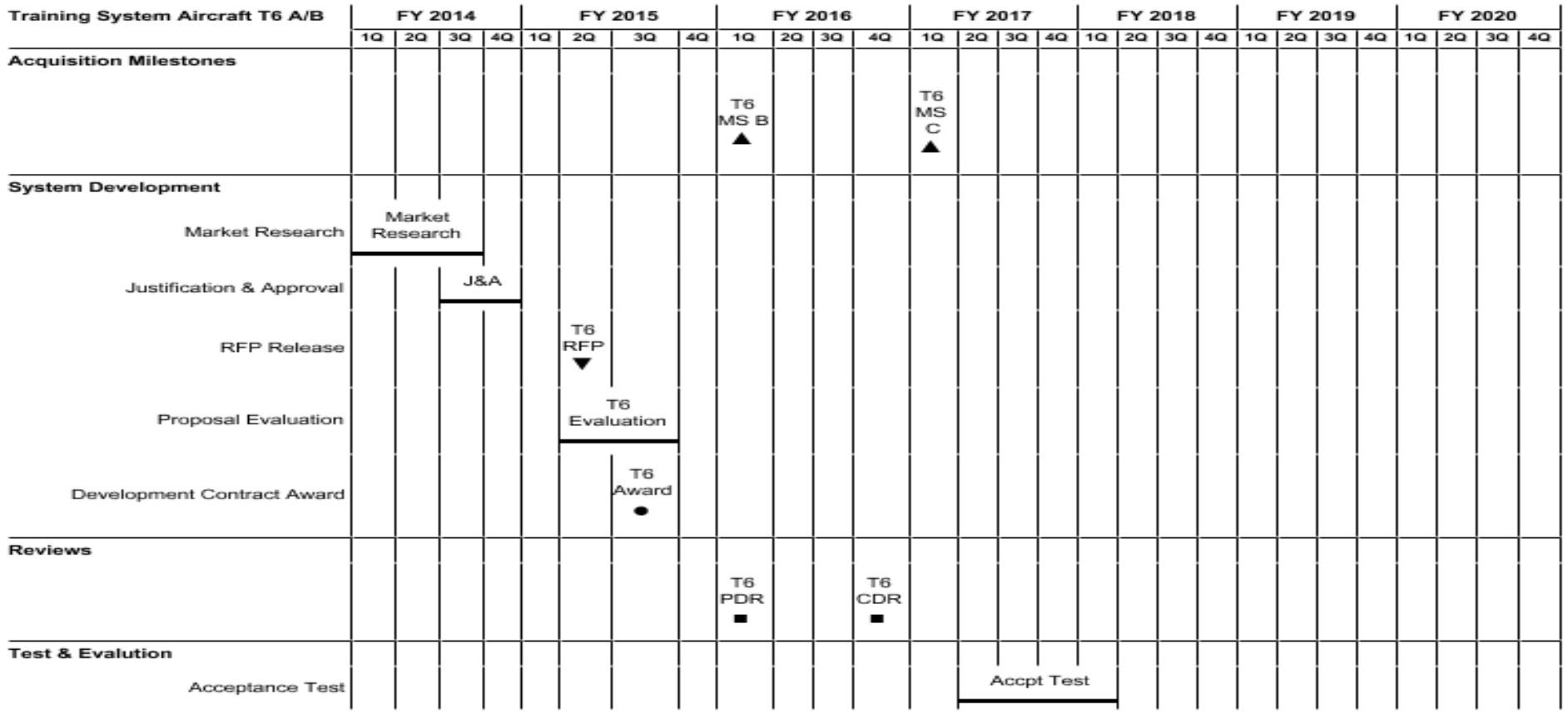

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Exhibit R-4A, RDT&E Schedule Details: PB 2016 Navy		Date: February 2015
Appropriation/Budget Activity 1319 / 5	**R-1 Program Element (Number/Name)** PE 0603208N / *Training System Aircraft*	**Project (Number/Name)** 3367 / *Training Aircraft Updates*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Training System Aircraft T45				
Acquistion Milestones: T45 Milestone B	1	2017	1	2017
Acquistion Milestones: T45 Milestone C	2	2018	2	2018
System Development: Hardware Development: T45 Hardware Development	1	2016	2	2018
Reviews: T45 Preliminary Design Review	4	2016	4	2016
Reviews: T45 Critical Design Review	4	2016	4	2016
Test & Evaluation: Technical Evaluation: T45 Integrated Test & Evaluation	2	2017	1	2018
Contract Awards: T45 Engineering Manufacturing Development	4	2015	4	2015
Deliveries: Lab Assests: T45 Lab Assets	3	2016	3	2016
Deliveries: Test Assests: T45 Test Assests	2	2017	2	2017
Training System Aircraft T6 A/B				
Acquisition Milestones: Milestone B	1	2016	1	2016
Acquisition Milestones: Milestone C	1	2017	1	2017
System Development: Market Research: Market Research	1	2014	3	2014
System Development: Justification & Approval: J&A	3	2014	4	2014
System Development: RFP Release: RFP Release	2	2015	2	2015
System Development: Proposal Evaluation: Proposal Evaluation	2	2015	3	2015
System Development: Development Contract Award: Contract Award	3	2015	3	2015
Reviews: T6 Preliminary Design Review	1	2016	1	2016
Reviews: T6 Critical Design Review	4	2016	4	2016
Test & Evalution: Acceptance Test: Acceptance Test	2	2017	1	2018