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Exhibit R-2, RDT&E Budget Item Justification: PB 2016 Navy **Date:** February 2015

Appropriation/Budget Activity 1319: <i>Research, Development, Test & Evaluation, Navy / BA 7: Operational Systems Development</i>					R-1 Program Element (Number/Name) PE 0305204N / <i>Tactical Unmanned Aer Vehicles</i>							
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	180.885	8.381	8.505	8.550	-	8.550	8.797	8.910	9.095	9.286	Continuing	Continuing
2478: <i>Tactical Control System</i>	180.885	8.381	8.505	8.550	-	8.550	8.797	8.910	9.095	9.286	Continuing	Continuing

A. Mission Description and Budget Item Justification

Tactical Unmanned Aerial Vehicle is a Joint Military Intelligence Program

This Program Element (PE) provides for the joint tactical MQ-8 Fire Scout System support for DoD to provide the warfighters with the capability for day/night aerial Intelligence, Surveillance and Reconnaissance, Target Acquisition, intelligence, communications/data relay, and minefield detection. This PE includes the Tactical Control System (TCS) which provides a multi-level, scalable, and flexible operator control of the air vehicles and payloads, as well as direct receipt and dissemination of unmanned aerial vehicles sensor data.

B. Program Change Summary (\$ in Millions)	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
Previous President's Budget	8.381	8.505	8.624	-	8.624
Current President's Budget	8.381	8.505	8.550	-	8.550
Total Adjustments	-	-	-0.074	-	-0.074
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Rate/Misc Adjustments	-	-	-0.074	-	-0.074

Change Summary Explanation

Schedule:

Updated TCS schedule to coincide with MQ-8 Fire Scout schedule milestones.

MQ-8 related milestones

Revised milestone terminology: Removed Rapid Deployment Capability (RDC) terminology to align with transition of RDC capabilities to the program of record.

Updated associated T&E events to remove reference to RDC.

Updated Milestone C decision to align with planning for the restructured ACAT ID program.

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Technical: None		

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Exhibit R-2A, RDT&E Project Justification: PB 2016 Navy										Date: February 2015		
Appropriation/Budget Activity 1319 / 7					R-1 Program Element (Number/Name) PE 0305204N / <i>Tactical Unmanned Aer Vehicles</i>				Project (Number/Name) 2478 / <i>Tactical Control System</i>			
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
2478: <i>Tactical Control System</i>	180.885	8.381	8.505	8.550	-	8.550	8.797	8.910	9.095	9.286	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program supports the MQ-8 Fire Scout System Tactical Control System (TCS), a standards-based system, that provides interoperability and commonality for Command and Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance interfaces of Unmanned Aircraft Systems (UAS). TCS software, operating on Mission Control Station (also referred to as Ground Control Station) hardware, utilizes North Atlantic Treaty Organization (NATO) Standardization Agreements (STANAG)-4586 architecture communicating across a Tactical Common Data Link.

TCS provides a full range of scalable UAS capabilities from passive receipt of air vehicle and payload data to full air vehicle and payload command and control. TCS offers the warfighter a common core operating environment to simultaneously receive, process, and disseminate data from different UAS types for intelligence, reconnaissance, surveillance, and combat assessment.

This program supports enhancements and updates to TCS in order to continue to meet supported air vehicle enhancements, incorporation of new technologies that will be used to enhance overall system performance, incorporate new payloads and payload capabilities (such as advanced sensors and weapons), incorporate multi-vehicle control, incorporate NATO STANAG-4586 and Command, Control, Communications, Computers and Intelligence enhancements, and alignment with OSD direction for UAS control segments.

TCS software is incorporated into the MQ-8 Fire Scout System and fields in conjunction with MQ-8. TCS software addresses MQ-8 requirements validated by the Joint Requirements Oversight Council in the MQ-8 Capability Production Document (May 2007) and multiple Joint Emergent Operational Need/Urgent Operational Needs statements. TCS supported by a Operational Requirements Document (Feb 2000).

TCS maximizes the use of contractor and government off-the-shelf hardware and software whenever possible and incorporates software/hardware enhancements where appropriate to maintain growth potential and minimize hardware and operating system dependence. TCS software is interoperable and is compliant with the OSD Command and Control, Communications, Intelligence Joint Technical Architecture, Distributed Common Ground System standards, Global Command and Control System, and NATO standards. TCS hardware and software upgrades will support the Navy's Common Control System migration.

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

	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
Title: TCS Development and Integration	7.727	7.846	7.882	-	7.882
Articles:	-	-	-	-	-
FY 2014 Accomplishments:					

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)					
Continued TCS integration with MQ-8 development. Continued new TCS capabilities to support requirements for Littoral Combat Ship efforts. Continued TCS STANAG 4586 compliance. Continued TCS C4ISR interface integration and testing for MQ-8 systems. Continued hardware and operating system independence initiatives. Continued radar and payload integration, MQ-8C integration, and commenced preparations for Common Control Software Integration and demonstrations.					
FY 2015 Plans: Continue Tactical Command System (TCS) integration and test with MQ-8 development. Continue new TCS capabilities to support requirements for Littoral Combat Ship (LCS) efforts. Continue TCS Standarization Agreements (STANAG)-4586 compliance. Continue TCS C4ISR interface integration and testing for MQ-8 systems. Continue hardware and operating system independence initiatives. Continue radar and payload integration, MQ-8C Integration, and continue preparations for Common Control System integration and demonstrations. Continue technology refresh, LINUX transition, and move to service oriented architecture.					
FY 2016 Base Plans: Continue TCS integration and test with MQ-8 development. Continue new TCS capabilities to support requirements for LCS efforts. Continue TCS STANAG 4586 compliance. Continue TCS C4ISR interface integration and testing for MQ-8 systems. Continue hardware and operating system independence initiatives. Continue radar and payload integration, MQ-8C integration, and continue preparations for Common Control System integration and demonstrations. Continue technology refresh, LINUX transition, and move to service oriented architecture.					
FY 2016 OCO Plans: N/A					
Title: Technical and Engineering Services					
Articles:					
	0.654	0.659	0.668	-	0.668
	-	-	-	-	-
FY 2014 Accomplishments: Continued government engineering support, contractor support, program support, and travel for the TCS program.					
FY 2015 Plans: Continue government engineering support, contractor support, program support, and travel for the TCS program.					
FY 2016 Base Plans:					

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
Continue government engineering support, contractor support, program support, and travel for the TCS program. FY 2016 OCO Plans: N/A					
Accomplishments/Planned Programs Subtotals	8.381	8.505	8.550	-	8.550

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

N/A

Remarks

D. Acquisition Strategy

The Tactical Control System (TCS) program is Government owned, non-proprietary software that currently supports the MQ-8 Fire Scout program. The TCS program continues to focus on Navy requirements and standards based on interoperability. Government-owned TCS software development toolkit is available to all UAS developers and manufacturers that allows a low-cost integration into the open architecture non-proprietary TCS system. TCS will provide software modules to the Navy Common Control System (CCS) and the TCS tech refresh hardware will support migration to CCS software.

E. Performance Metrics

Successfully complete Navy payloads integration, to include Coastal Battlefield Reconnaissance and Analysis. Support MQ-8C Endurance Upgrade, Radar, and Weapons capabilities and transition of those capabilities into the MQ-8 Program of Record. Successfully complete Littoral Combat Ship Integration. Complete Developmental and Operational Test.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2016 Navy **Date:** February 2015

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305204N / <i>Tactical Unmanned Aer Vehicles</i>	Project (Number/Name) 2478 / <i>Tactical Control System</i>
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Product Development (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 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			
Primary Software Development 2	SS/CPPIF	Raytheon : Falls Church, VA	14.288	7.727	Nov 2013	7.846	Nov 2014	7.882	Nov 2015	-		7.882	39.610	77.353	77.353
Prior Year Cost no longer Funded in the FYDP	C/CPAF	Raytheon : Falls Church, VA	148.237	-		-		-		-		-	-	148.237	148.237
Subtotal			162.525	7.727		7.846		7.882		-		7.882	39.610	225.590	225.590

Remarks
Awarded 85.6% of award fees in past award fee periods.

Test and Evaluation (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 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			
Development Test and Evaluation	WR	Various : Various	1.250	0.023	Nov 2013	0.023	Nov 2014	0.023	Nov 2015	-		0.023	Continuing	Continuing	Continuing
Subtotal			1.250	0.023		0.023		0.023		-		0.023	-	-	-

Management Services (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 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			
Contractor Engineering Support	Various	Various : Various	3.109	0.187	Nov 2013	0.190	Nov 2014	0.193	Nov 2015	-		0.193	Continuing	Continuing	Continuing
Government Engineering Support	WR	Various : Various	9.459	0.227	Nov 2013	0.226	Nov 2014	0.229	Nov 2015	-		0.229	Continuing	Continuing	Continuing
Program Management Support	Various	Various : Various	4.242	0.194	Nov 2013	0.197	Nov 2014	0.200	Nov 2015	-		0.200	Continuing	Continuing	Continuing
Travel	WR	NAVAIR : Patuxent River, MD	0.300	0.023	Nov 2013	0.023	Nov 2014	0.023	Nov 2015	-		0.023	Continuing	Continuing	Continuing
Subtotal			17.110	0.631		0.636		0.645		-		0.645	-	-	-

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Management Services (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 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			

Remarks
Travel Contract Type is TO.

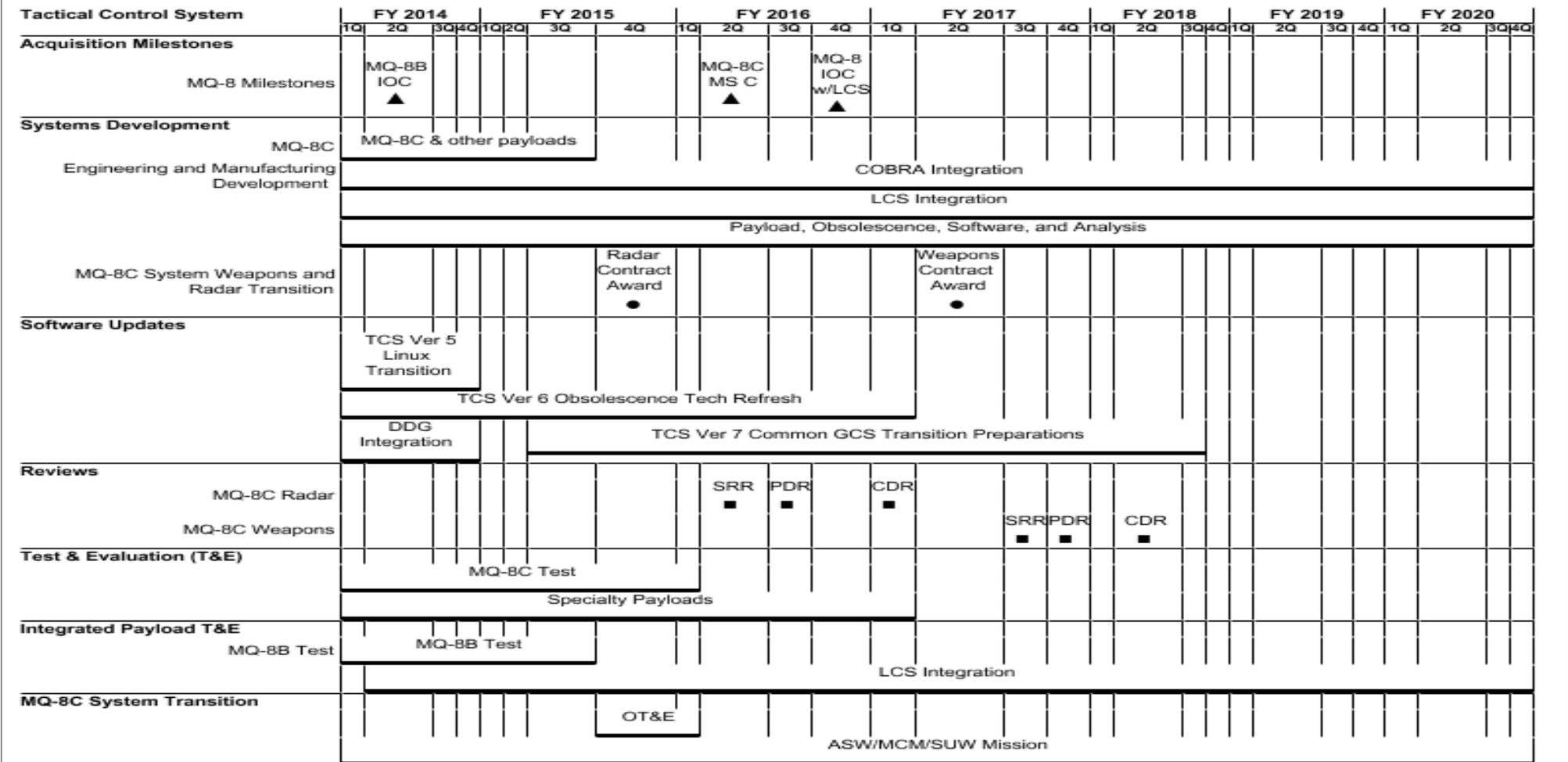
	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	180.885	8.381	8.505	8.550	-	8.550	-	-	-

Remarks

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Exhibit R-4, RDT&E Schedule Profile: PB 2016 Navy **Date:** February 2015

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Exhibit R-4A, RDT&E Schedule Details: PB 2016 Navy		Date: February 2015
Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305204N / <i>Tactical Unmanned Aer Vehicles</i>	Project (Number/Name) 2478 / <i>Tactical Control System</i>

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Tactical Control System</i>				
Acquisition Milestones: MQ-8 Milestones: MQ-8 Initial Operational Capability (IOC)	2	2014	2	2014
Acquisition Milestones: MQ-8 Milestones: MQ-8 Initial Operational Capability (IOC) MQ-8C Littoral Combat Ship (LCS)	4	2016	4	2016
Acquisition Milestones: MQ-8 Milestones: MQ-8C Milestone C	2	2016	2	2016
Systems Development: MQ-8C: MQ-8C and other payloads	1	2014	3	2015
Software Updates: TCS Ver 5 Linux Transition	1	2014	4	2014
Software Updates: TCS Ver 6 Obsolescence Tech Refresh	1	2014	1	2017
Software Updates: TCS Ver 7 Common GCS Transition Preparations	3	2015	3	2018
Software Updates: DDG Integration	1	2014	4	2014
Systems Development: Engineering and Manufacturing Development: Coastal Battlefield Reconnaissance and Analysis Integration (COBRA), BLK 1/2/3	1	2014	4	2020
Systems Development: Engineering and Manufacturing Development: Littoral Combat Ship (LCS) Integration	1	2014	4	2020
Systems Development: Engineering and Manufacturing Development: Payload, Obsolescence, Software, and Analysis	1	2014	4	2020
Systems Development: MQ-8C System Weapons and Radar Transition: Radar Contract Award	4	2015	4	2015
Systems Development: MQ-8C System Weapons and Radar Transition: Weapons Contract Award	2	2017	2	2017
Reviews: MQ-8C Radar: System Requirements Review (SRR)	2	2016	2	2016
Reviews: MQ-8C Radar: Preliminary Design Review (PDR)	3	2016	3	2016
Reviews: MQ-8C Radar: Critical Design Review (CDR)	1	2017	1	2017
Reviews: MQ-8C Weapons: System Requirements Review	3	2017	3	2017

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Exhibit R-4A, RDT&E Schedule Details: PB 2016 Navy **Date:** February 2015

Appropriation/Budget Activity 1319 / 7	R-1 Program Element (Number/Name) PE 0305204N / <i>Tactical Unmanned Aer Vehicles</i>	Project (Number/Name) 2478 / <i>Tactical Control System</i>
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Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Reviews: MQ-8C Weapons: Preliminary Design Review	4	2017	4	2017
Reviews: MQ-8C Weapons: Critical Design Review	2	2018	2	2018
Test & Evaluation (T&E): MQ-8C Development Test	1	2014	1	2016
Test & Evaluation (T&E): Specialty Payloads	1	2014	1	2017
Integrated Payload T&E: MQ-8B Test: MQ-8B	1	2014	3	2015
Integrated Payload T&E: MQ-8B Test: Littoral Combat Ship (LCS) Integration	2	2014	4	2020
MQ-8C System Transition: Operational Test and Evaluation (OT&E)	4	2015	1	2016
MQ-8C System Transition: ASW/MCM/SUW Mission	1	2014	4	2020
MQ-8C System Transition: MQ-8C Radar and Weapons Transition: Radar Developmental Test (DT)	2	2017	1	2018
MQ-8C System Transition: MQ-8C Radar and Weapons Transition: Radar Operational Test (OT)	2	2018	3	2018
MQ-8C System Transition: MQ-8C Radar and Weapons Transition: Weapons Developmental Test (DT)	3	2018	2	2019
MQ-8C System Transition: MQ-8C Radar and Weapons Transition: Weapons Operational Test (OT)	3	2019	1	2020
Production Milestones: Contract Awards: Air Vehicles MQ-8C III	2	2014	2	2014
Production Milestones: Contract Awards: Air Vehicles MQ-8C IV	3	2015	3	2015
Production Milestones: Contract Awards: Air Vehicles MQ-8C V	2	2016	2	2016
Production Milestones: Contract Awards: Air Vehicles MQ-8C VI	2	2017	2	2017
Production Milestones: Contract Awards: Air Vehicles MQ-8C VII	2	2018	2	2018
Production Milestones: Contract Awards: Air Vehicles MQ-8C VIII	2	2019	2	2019
Production Milestones: Contract Awards: Air Vehicles MQ-8C IX	2	2020	2	2020