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<b>Exhibit R-2, RDT&amp;E Budget Item Justification:</b> PB 2017 Navy	<b>Date:</b> February 2016
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<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 0604504N / <i>Air Control</i>							
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
Total Program Element	73.592	28.669	57.928	47.404	-	47.404	65.223	51.835	51.671	52.695	Continuing	Continuing
0718: <i>MATCALs</i>	3.559	3.868	1.412	0.314	-	0.314	1.519	0.980	0.633	0.646	Continuing	Continuing
0993: <i>Carrier ATC</i>	67.590	12.685	40.559	30.254	-	30.254	33.339	28.933	29.114	29.669	Continuing	Continuing
1657: <i>ATC Improvement</i>	2.443	0.604	0.399	0.383	-	0.383	0.406	0.416	0.425	0.434	Continuing	Continuing
3372: <i>ATC Systems</i>	0.000	11.512	15.558	16.453	-	16.453	29.959	21.506	21.499	21.946	Continuing	Continuing

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

This program element provides for the development, integration, and testing of Automated Air Traffic Control (ATC) hardware and software required to provide improved flight safety and more reliable all-weather ATC and landing system capabilities at Naval Air Stations (NASs) and Marine Corps Air Stations (MCASs) and Fleet Area Control and Surveillance Facilities (FACSFAC) worldwide. Funded programs are required to upgrade or replace aging ATC and landing system equipment on aircraft, aircraft carriers, amphibious ships, NASs, MCASs and Navy/Marine Corps tactical/expeditionary airfields and remote landing sites.

JUSTIFICATION FOR BUDGET ACTIVITY: 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>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
Previous President's Budget	29.037	57.928	53.368	-	53.368
Current President's Budget	28.669	57.928	47.404	-	47.404
Total Adjustments	-0.368	0.000	-5.964	-	-5.964
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-0.200	0.000			
• SBIR/STTR Transfer	-0.168	0.000			
• Program Adjustments	0.000	0.000	-5.649	-	-5.649
• Rate/Misc Adjustments	0.000	0.000	-0.315	-	-0.315

**Change Summary Explanation**

Funding: Decrease in Air Control by \$1.989 million in FY 17 as required for the Department of the Navy to comply with the Bipartisan Budget Act of 2015.

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Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319: Research, Development, Test & Evaluation, Navy / BA 5: System Development & Demonstration (SDD)	R-1 Program Element (Number/Name) PE 0604504N / Air Control	
<p>Funding: The FY 2017 funding request was reduced by \$2.957 million to account for the availability of prior years execution balance.</p> <p>Funding: FY 2015 funding reduced to finance higher Department priority need.</p> <p>Schedule:</p> <p>0718: The G/ATOR FY2015 efforts did not occur, it has delayed the contract award to 2nd Quarter FY2017.</p> <p>0993: The Material Development Decision for AN/SPN-50(V)1 shifted from 2QFY2015 to 4QFY2015 directed by PEOT. Critical Design Review AN/SPN-50(V)1 for FY2017 was added to the FY2017 plans.</p> <p>1657: The Fleet ATC Systems FY2015 efforts did not occur, all FY2015 funding was redirected to NASMOD VIDS efforts due to program priorities.</p>		

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy										Date: February 2016		
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0604504N / <i>Air Control</i>				Project (Number/Name) 0718 / <i>MATCAL</i> S			
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
0718: <i>MATCAL</i> S	3.559	3.868	1.412	0.314	-	0.314	1.519	0.980	0.633	0.646	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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

This program provides for continued development, integration, and testing of hardware and software to meet requirements for all-weather operations and improved flight safety of Air Traffic Control (ATC) and Landing Systems at Marine Corps expeditionary airfields. An Acquisition Decision Memorandum from Jan 2005 approved the use of the U.S. Army AN/TPN-31 Air Traffic Navigation, Integration, and Coordination System (ATNAVICS) to fulfill the Air Surveillance and Precision Approach Radar and Control System (ASPARCS) requirement for Jul 2006. The ATNAVICS will replace the legacy ATC Precision Approach Radar (PAR), Airport Surveillance Radar (ASR), and Command and Control Subsystem with a High Mobility Multipurpose Wheeled Vehicle based PAR, ASR and Command and Control Subsystem. The MROC Decision Memorandum 11-2005 of Dec 2004 outlines the evolutionary improvements required by Headquarters Marine Corps. This program works with the Marine ATC Working Group identifying the requirements to implement the P3I and evolutionary product improvements as required for G/ATOR, ATNAVICS, Expeditionary ATC Towers, and Navigational Aids that support Marine Air Traffic Control Detachments.

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

	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
<b>Title:</b> ASPARCS Improvements	3.868	0.617	0.264	0.000	0.264
<b>Articles:</b>	-	-	-	-	-
<b>Description:</b> Investigate and resolve obsolescence issues. Perform studies and analyses to implement P3I and other evolutionary improvements. Develop criteria for existing ASPARCS software to achieve Defense Information Infrastructure-Common Operating Environment Level 5 compliance, Information Assurance, Radar Range Extension and Mapping functionality, and enhanced simulation and training into the existing ASPARCS software. Perform Mode 5/S integration, operational functionality study and analyses with AN/TPN-31(V)7 ATNAVICS System.					
<b>FY 2015 Accomplishments:</b> Developed Expeditionary ATC Tower capability improvements via the Engineering Change Proposal (ECP) process as assessed by the Decision Analysis Support study conducted by NAVAIR 4.10. Performed a Data Information Part 1 ECP to address mobility, alternate power source, and locate communication (radar, visual, weather, links, Non-Classified Internet Protocol Router & Secret Internet Protocol Router) enhancing products that will provide greater situational awareness for the air traffic controller in an expeditionary environment. Performed Mode 5 Part 1 ECP for the integration, operational functionality study and analyses with AN/TPN-31(V)7 ATNAVICS System.					

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016			
Appropriation/Budget Activity 1319 / 5		R-1 Program Element (Number/Name) PE 0604504N / Air Control		Project (Number/Name) 0718 / MATCALs		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Performed Part 1 Tactical Air Navigation Modernization ECP to study methods of reducing the overall operational footprint of the ASPARCS and achieve increased expeditionary maneuver capability.  <b>FY 2016 Plans:</b> Complete the Air Traffic Control Tower capability improvement Part 1 Engineering Change Proposal (ECP) that recommends which areas; mobility, alternate power source, and identify additional communication (radar, visual, weather, links, Non-Classified Internet Protocol Router & Secret Internet Protocol Router) products that can be upgraded via a Part 2 ECP and provide greater situational awareness for air traffic controllers utilizing these systems. Complete the Part 1 Tactical Air Navigation Modernization ECP for AMTAC.  <b>FY 2017 Base Plans:</b> Develop Part 1 ECP to select and implement the next operating system for AN/TPN-31 (V)7 Air Traffic Navigation, Integration, and Coordination System (ATNAVICS).  <b>FY 2017 OCO Plans:</b> N/A						
Title: Ground/Air Task Oriented Radar System (G/ATOR) Block 4  Articles:  Description: G/ATOR is multi-role, ground-based, expeditionary radar that replaces five legacy radar systems for the Marine Air Ground Task Force. It satisfies the Marine Air Command and Control System and the Ground Counter Fire/ Counter Battery capabilities. The G/ATOR replaces the AN/TPS-63 and complements the AN/TPS-59 long range radar and will provide mobile, multi-functional, three-dimensional surveillance of air breathing targets, detection of cruise missiles and Unmanned Aerial Systems, and the cueing of air defense weapons. The G/ATOR contributes to the extension of Sea Shield/Sea Strike by surveillance and detection of enemy air threats not seen by Navy sensors in the littorals by participating in a cooperative engagement network of sensors and shooters; G/ATOR enables Integrated Fire Control (IFC) and provides engage/fire on remote capability. G/ATOR surveillance coverage with IFC will provide unprecedented reach, volume and precision in the execution of Operational Maneuver From The Sea allowing Naval forces to project and sustain power deep inland.  G/ATOR Block 4, scheduled for an Initial Operating Capability in 2QFY19, will add military air traffic control functionality, development of Mode 5/S capability, Federal Aviation Administration flight certification requirements, and the ability to integrate with AN/TPN-31(V) ATNAVICS for Precision Approach Radar. This increment of G/ATOR replaces the Marine Corps' AN/TPS-73 radar and the Airport Surveillance Radar portion of the ATNAVICS also known as Air Surveillance and Precision Approach Radar Control System.		0.000 -	0.795 -	0.050 -	0.000 -	0.050 -

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Navy			<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604504N / <i>Air Control</i>	<b>Project (Number/Name)</b> 0718 / MATCALs	

<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
<p><b><i>FY 2015 Accomplishments:</i></b> The G/ATOR Program Office has experienced significant delays in completing Blocks 1-3. This has further delayed commencement of Block 4 and, as such, no G/ATOR efforts were accomplished.</p> <p><b><i>FY 2016 Plans:</i></b> Begin efforts to achieve Federal Aviation Administration (FAA) flight certification for G/ATOR. Commence Command &amp; Control (C2) and AN/TPN-31(V)7 integration requirements. Continue Mode 5/S development for G/ATOR.</p> <p><b><i>FY 2017 Base Plans:</i></b> Complete the hardware/software development to achieve FAA flight certification for G/ATOR. Complete the hardware/software requirements for the integration of AN/TPN-31(V)7 Air Traffic Navigation, Integration, and Coordination System (ATNAVICS) and G/ATOR. Complete the Mode 5/S development for G/ATOR.</p> <p><b><i>FY 2017 OCO Plans:</i></b> N/A</p>					
<b>Accomplishments/Planned Programs Subtotals</b>	3.868	1.412	0.314	0.000	0.314

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

<b>Line Item</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• OPN/2815: MATCALs	19.779	10.011	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	294.376
• RDTEN/0204460M: G/ATOR	90.577	65.598	83.538	-	83.538	50.274	10.072	12.510	6.348	Continuing	Continuing
• PMC/4655: RADAR SYSTEMS	0.000	0.000	0.000	-	0.000	0.000	0.000	60.600	70.200	Continuing	Continuing
• OPN/2820: Ashore ATC Equipment/MATCALs	0.000	0.000	2.542	-	2.542	3.143	3.313	5.791	5.909	Continuing	Continuing

**Remarks**

Ashore ATC Equipment: FY2017-FY2021 reflects MATCALs portion of Ashore ATC Equipment budget.

**D. Acquisition Strategy**

An Acquisition Decision Memorandum was signed in Jan 2005 approving the procurement of the Army AN/TPN-31 ATNAVICS to fulfill the Air Surveillance and Precision Approach Radar and Control System requirement for July 2006. The MROC Decision Memorandum 11-2005 of December 2004 outlined the evolutionary improvements required by Headquarters Marine Corps. This program has joined with the Army to implement Pre-Planned Product Improvements and evolutionary product improvements. G/ATOR Block IV, scheduled for an Initial Operating Capability in 2019, will add military air traffic control FAA flight certification requirements, and the ability to integrate with AN/TPN-31 ATNAVICS for Precision Approach Radar. The Marine Air Traffic Control (ATC) Working Group identified requirements

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PE 0604504N: *Air Control*  
Navy

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy												Date: February 2016			
Appropriation/Budget Activity 1319 / 5						R-1 Program Element (Number/Name) PE 0604504N / <i>Air Control</i>				Project (Number/Name) 0718 / MATCALs					
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
Primary HDW Develop - ASPARCS Mode 5/S	WR	NAWCAD : Patuxent River, MD	0.000	1.230	Dec 2014	0.047	Dec 2015	0.107	Dec 2016	-		0.107	0.000	1.384	-
Primary HDW Develop - ASPARCS	WR	SPAWARSYSCEN : San Diego, CA	0.000	0.453	Dec 2014	0.057	Dec 2015	0.000		-		0.000	0.000	0.510	-
Primary HDW Develop - ASPARCS	C/CPFF	TRANDES : San Diego, CA	0.000	1.783	Jun 2015	0.000		0.000		-		0.000	0.000	1.783	1.783
Subtotal			0.000	3.466		0.104		0.107		-		0.107	0.000	3.677	-
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
Software Development - G/ATOR	WR	NSWC : Dahlgren, VA	0.000	0.000		0.595	Mar 2016	0.025	Jan 2017	-		0.025	Continuing	Continuing	Continuing
Software Development - ASPARCS	WR	NAWCAD : Patuxent River, MD	3.319	0.162	Dec 2014	0.229	Dec 2015	0.107	Dec 2016	-		0.107	Continuing	Continuing	Continuing
Software Development - Mode 5/S Dev - G/ATOR	SS/CPIF	Telephonics : Huntington Station, NY	0.000	0.000		0.000		0.025	Jan 2017	-		0.025	Continuing	Continuing	Continuing
Subtotal			3.319	0.162		0.824		0.157		-		0.157	-	-	-
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	WR	NAWCAD : Patuxent River, MD	0.240	0.240	Dec 2014	0.284	Dec 2015	0.050	Dec 2016	-		0.050	Continuing	Continuing	Continuing
Program Managemnt Support	WR	G/ATOR : PEO Land Systems	0.000	0.000		0.200	Mar 2016	0.000		-		0.000	0.000	0.200	-
Subtotal			0.240	0.240		0.484		0.050		-		0.050	-	-	-

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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis:</b> PB 2017 Navy										<b>Date:</b> February 2016			
<b>Appropriation/Budget Activity</b> 1319 / 5					<b>R-1 Program Element (Number/Name)</b> PE 0604504N / <i>Air Control</i>					<b>Project (Number/Name)</b> 0718 / MATCALs			
	<b>Prior Years</b>	<b>FY 2015</b>		<b>FY 2016</b>		<b>FY 2017 Base</b>		<b>FY 2017 OCO</b>		<b>FY 2017 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Project Cost Totals</b>	3.559	3.868		1.412		0.314		-		0.314	-	-	-
<b>Remarks</b>													



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PE 0604504N: *Air Control*  
Navy

R-1 Line #120

Appropriation/Budget Activity 1319 / 5													R-1 Program Element (Number/Name) PE 0604504N / Air Control								Project (Number/Name) 0718 / MATCAL S							
MATCAL S	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	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
Acquisition Milestones																												
System Development																												
Software Development																												
Hardware Development																												
Production Milestones																												

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2017 Navy			<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604504N / <i>Air Control</i>	<b>Project (Number/Name)</b> 0718 / <i>MATCAL</i> S	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>MATCAL</b> S				
Acquisition Milestones: G/ATOR Block 4	2	2019	2	2019
System Development: Software Development: G/ATOR	1	2016	2	2019
System Development: Hardware Development: ASPARCS Improvements	1	2015	4	2021
Production Milestones: G/ATOR Block 4	2	2017	2	2017

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy										Date: February 2016		
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0604504N / <i>Air Control</i>				Project (Number/Name) 0993 / <i>Carrier ATC</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
0993: <i>Carrier ATC</i>	67.590	12.685	40.559	30.254	-	30.254	33.339	28.933	29.114	29.669	Continuing	Continuing
Quantity of RDT&E Articles		-	2	1	-	1	-	-	-	-		

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

Shipboard Air Traffic Control systems, interfacing with versions of the AN/TPX-42A(V) Direct Altitude and Identity Readout (DAIR), allow shipboard Air Traffic Controllers to identify, marshal, and direct aircraft within a 50 Nautical Mile (NM) radius of the ship. In recent years, the top 25 percent of the AN/SPN-43C frequency band has been reallocated to the Fixed Wireless Access Community prohibiting Air Traffic Control (ATC) Air Search Radar (ASR) operation within 50NM of the coast. Because the Navy requires an air traffic control surveillance radar, this project unit will include engineering efforts to identify requirements and develop the AN/SPN-50(V)1 as an AN/SPN-43C replacement system. In addition, bridging Engineering Change Proposals (ECP) will be required to sustain the AN/SPN-43C capability until the AN/SPN-50(V)1 is completely fielded. Finally, the AN/TPX-42A(V) DAIR underwent several phased upgrades that have resulted in a number of field changes/technology refresh/insertion efforts. System improvements include replacing militarized front-end equipment in the track processor with open architecture Commercial Off the Shelf technology, converting the operational program software to more commonly used and flexible "C" language, providing the "hooks" for potential interface with Mode 5 Identification Friend or Foe, and integrating a flat panel monitor into the controller work station. The development of an ATC common console will reduce operational costs, improve reliability, and provide compatible interfaces and commonality for all ATC workstations. The addition of an embedded trainer within AN/TPX-42A(V) will improve controller training and increase flight safety. FY2017 funding provided to order 1 AN/SPN-50(V)1 Engineering Development Model.

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

	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
<b>Title:</b> AN/SPN-50	7.487	35.622	25.606	0.000	25.606
<b>Articles:</b>	-	2	1	-	1
<b>Description:</b> This project funds the development of the AN/SPN-43C replacement program (AN/SPN-50), which was previously funded under AN/SPN-43C. This system enables Air Traffic Controllers to assure the safe and expeditious movement of air traffic. This capability is an enabler in maintaining launch/recovery cycle times/sortie rates. #3 CVN NARG, #1 ATC NARG priorities.					
<b>FY 2015 Accomplishments:</b> Released RFP and initiated source selection for AN/SPN-50(V)1 contract award. Achieved Material Development Decision. System Requirements Review closed out. Test and Evaluation Master Plan Signed. System Requirement Document signed.					
<b>FY 2016 Plans:</b> Complete Source Selection for AN/SPN-50, award contract. Order two Pre-CDR configuration Engineering Development Model (EDM) units and conduct Systems Engineering. EDMs will be existing production Commercial Off The Shelf (COTS) units that will not meet all SPN-50 requirements. The EDMs will be used for					

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B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
integration and initial DT/environmental testing. PDR & CDR planned in FY16/FY17 will determine modifications required to meet all SPN-50 requirements. <b>FY 2017 Base Plans:</b> Achieve Critical Design Review (CDR). Order one Post-CDR configuration EDM, conduct Systems Engineering and test. <b>FY 2017 OCO Plans:</b> N/A						
<b>Title:</b> AN/SPN-43C  <b>Articles:</b>  <b>Description:</b> This project funds the development of the AN/SPN-43C replacement program and the development of sustainment Engineering Change Proposals (ECP) for the existing system. The sustainment effort will ensure the capabilities provided by the AN/SPN-43C remain available to CVN, LHA and LHD type ships until the replacement system is fielded.  <b>FY 2015 Accomplishments:</b> Release RFP and initiate source selection for AN/SPN-50(V)1 contract award. Continue sustainment ECPs for the AN/SPN-43C.  <b>FY 2016 Plans:</b> Continue sustainment ECPs for AN/SPN-43C.  <b>FY 2017 Base Plans:</b> Continue sustainment ECPs for AN/SPN-43C.  <b>FY 2017 OCO Plans:</b> N/A		1.566 -	1.404 -	1.263 -	0.000 -	1.263 -
<b>Title:</b> AN/TPX-42  <b>Articles:</b>  <b>Description:</b> This project funds the ongoing modernization of the AN/TPX-42 system through engineering changes and technology refresh. Specific engineering changes are: Development of a Multi Function Console (MFC) which will consolidate and replace the AN/SPN-46/35 as well as AN/TPX-42 displays with a single multifunction air traffic control display configuration; Replacement of the AN/TPX-42 proprietary Radar Data		3.632 -	3.533 -	3.385 -	0.000 -	3.385 -

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<b>Appropriation/Budget Activity</b> 1319 / 5				<b>R-1 Program Element (Number/Name)</b> PE 0604504N / <i>Air Control</i>				<b>Project (Number/Name)</b> 0993 / <i>Carrier ATC</i>			
<b>B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)</b>											
						<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	
<p>Processor with an open architecture design and replacement of the system's obsolete voice recorder. It is expected that the MFC will lead to a nomenclature change for this system.</p> <p><b>FY 2015 Accomplishments:</b> Continue CATTCC/DAIR Recorder Replacement ECP; continue CATCC/AATCC DAIR Embedded Trainer ECP; Complete Multi-Function Console (MFC) Part 1 Engineering Change Proposal (ECP) and develop the Part 2 ECP.</p> <p><b>FY 2016 Plans:</b> Continue CATTCC/DAIR Recorder Replacement ECP; Complete CATCC/AATCC DAIR Embedded Trainer ECP.</p> <p><b>FY 2017 Base Plans:</b> Complete CATTCC/AATCC DAIR Recorder Replacement ECP; continue sustainment ECPs for AN/TPX-42.</p> <p><b>FY 2017 OCO Plans:</b> N/A</p>											
<b>Accomplishments/Planned Programs Subtotals</b>						12.685	40.559	30.254	0.000	30.254	
<b>C. Other Program Funding Summary (\$ in Millions)</b>											
<b>Line Item</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• OPN/2831: <i>Shipboard Air Traffic Control</i>	9.366	9.346	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	218.271
• OPN/2832: <i>Automatic Carrier Landing Systems</i>	21.357	21.281	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	155.476
• OPN/2830: <i>Afloat ATC Equipment</i>	0.000	0.000	33.484	-	33.484	44.403	48.380	48.915	49.776	Continuing	Continuing
<b>Remarks</b>											
<b>D. Acquisition Strategy</b>											
<p>AN/SPN-46 Computer Group replacement subprojects are part of the AN/SPN-46 Life Cycle Extension project, which is an ECP. Initial contract was awarded in November 2003 for the Radar Control Group, and the contract for the Computer Group was awarded in December 2005. AN/TPX-42 Voice/Video recorder replacement, Joint Precision Approach and Landing System Interface, Shipboard trainer, and Air Traffic Control (ATC) Console are all anticipated ECPs, with improvements being incorporated into the production of AN/TPX-42 upgrade kits. AN/SPN-43 replacement program will be an ACAT IVT program.</p>											

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604504N / <i>Air Control</i>	Project (Number/Name) 0993 / <i>Carrier ATC</i>
<p>All other projects are non-ACAT upgrades to existing systems. An evolutionary acquisition approach is being used to introduce these technology advancements that either satisfy user requirements, such as all weather operation, or address supportability and cost of ownership problems.</p> <p><b><u>E. Performance Metrics</u></b></p> <p>Award AN/SPN-50(V)1 post-CDR EDM contract 3QFY17. Attain MS C 2QFY20.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy												Date: February 2016			
Appropriation/Budget Activity 1319 / 5						R-1 Program Element (Number/Name) PE 0604504N / Air Control				Project (Number/Name) 0993 / Carrier ATC					
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
Primary HDW Develop-TPX-42	WR	NAWCAD : PAX River, MD	4.647	0.400	Dec 2014	0.374	Dec 2015	0.360	Dec 2016	-		0.360	Continuing	Continuing	Continuing
Primary HDW Develop - SPN-43	WR	NAWCAD : PAX River, MD	2.745	0.500	Dec 2014	0.474	Dec 2015	0.470	Dec 2016	-		0.470	Continuing	Continuing	Continuing
Primary HDW Develop - SPN-50(V)1 Pre-CDR Configuration EDM	TBD	TBD : TBD	0.000	0.000		26.770	Mar 2016	0.000		-		0.000	203.230	230.000	230.000
Primary HDW Develop - SPN-50(V)1 Post-CDR Configuration EDM	TBD	TBD : TBD	0.000	0.000		0.000		15.516	May 2017	-		15.516	0.000	15.516	15.516
Prior year Prod Dev no longer funded in the FYDP	Various	Various : Various	17.902	0.000		0.000		0.000		-		0.000	0.000	17.902	-
Subtotal			25.294	0.900		27.618		16.346		-		16.346	-	-	-
Remarks															
FY2016: EDMs will be existing production Commercial Off the Shelf (COTS) units that will not meet all SPN-50 requirements. The EDMs will be used for integration and initial DT/environmental testing. PDR & CDR planned in FY16/FY17 will determine modifications required to meet all SPN-50 requirements.															
FY2017: The SPN-50(V)1 Post-CDR EDM will include required modifications to meet SPN-50 requirements, to include hardware redesign, development, integration and test of Transmit/Receive modules; hardware redesign, development, integration and test of above and below deck hardware, which increases redundancy to extend operational availability from 94% to 98%.															
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
Software Development-TPX-42	WR	NAWCAD : PAX River, MD	14.621	1.400	Dec 2014	1.734	Dec 2015	1.700	Dec 2016	-		1.700	Continuing	Continuing	Continuing
Integrated Logistics Support- TPX-42	WR	NAWCAD : PAX River, MD	1.509	0.110	Dec 2014	0.120	Dec 2015	0.120	Dec 2016	-		0.120	Continuing	Continuing	Continuing
Integrated Logistics Support - SPN-43	WR	NAWCAD : PAX River, MD	0.315	0.306	Dec 2014	0.310	Dec 2015	0.200	Dec 2016	-		0.200	Continuing	Continuing	Continuing
Integrated Logistics Support-SPN-50(V)1	WR	NAWCAD : PAX River, MD	0.305	0.500	Dec 2014	0.700	Dec 2015	0.663	Dec 2016	-		0.663	0.000	2.168	-

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy												Date: February 2016			
Appropriation/Budget Activity 1319 / 5						R-1 Program Element (Number/Name) PE 0604504N / <i>Air Control</i>				Project (Number/Name) 0993 / <i>Carrier ATC</i>					
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
Studies & Analysis- SPN-50(V)1	WR	NAWCAD : PAX River, MD	0.942	2.500	Dec 2014	0.800	Dec 2015	0.763	Dec 2016	-		0.763	0.000	5.005	-
Software Development - SPN-50(V)1	WR	NAWCAD : PAX River, MD	1.218	2.087	Dec 2014	3.841	Dec 2015	3.797	Dec 2016	-		3.797	0.000	10.943	-
Studies & Analysis- SPN-43	WR	NAWCAD : PAX River, MD	1.929	0.060	Dec 2014	0.020	Dec 2015	0.020	Dec 2016	-		0.020	Continuing	Continuing	Continuing
Studies & Analysis- TPX-42	WR	NAWCAD : PAX River, MD	0.354	0.367	Dec 2014	0.100	Dec 2015	0.100	Dec 2016	-		0.100	Continuing	Continuing	Continuing
Systems Engineering- SPN-50(V)1	WR	NAWCAD : PAX River, MD	1.000	1.900	Dec 2014	2.911	Dec 2015	2.964	Dec 2016	-		2.964	0.000	8.775	-
Prior Year Support no longer funded in the FYDP	Various	Various : Various	13.393	0.000		0.000		0.000		-		0.000	0.000	13.393	-
Subtotal			35.586	9.230		10.536		10.327		-		10.327	-	-	-
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
Developmental Test & Evaluation- TPX-42	WR	NAWCAD : PAX River, MD	1.845	0.400	Dec 2014	0.500	Dec 2015	0.400	Dec 2016	-		0.400	Continuing	Continuing	Continuing
Development Test & Evaluation - SPN-43	WR	NAWCAD : PAX River, MD	0.200	0.700	Dec 2014	0.600	Dec 2015	0.573	Dec 2016	-		0.573	0.000	2.073	-
Operational Test & Evaluation-SPN-50(V)1	WR	OPTEVOR : Norfolk, VA	0.000	0.500	Dec 2014	0.600	Dec 2015	1.903	Dec 2016	-		1.903	0.000	3.003	-
Prior year T&E no longer funded in the FYDP	Various	Various : Various	1.707	0.000		0.000		0.000		-		0.000	0.000	1.707	-
Subtotal			3.752	1.600		1.700		2.876		-		2.876	-	-	-



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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy												Date: February 2016			
Appropriation/Budget Activity 1319 / 5						R-1 Program Element (Number/Name) PE 0604504N / Air Control				Project (Number/Name) 0993 / Carrier ATC					
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/CPFF	American Electronics, Inc. : California, MD	2.195	0.300	Dec 2014	0.300	Dec 2015	0.300	Dec 2016	-		0.300	1.500	4.595	4.595
Program Management Support	WR	NAWCAD : PAX River, MD	0.578	0.600	Dec 2014	0.350	Dec 2015	0.350	Dec 2016	-		0.350	Continuing	Continuing	Continuing
Travel	WR	NAVAIRHQ : PAX River, MD	0.185	0.055	Oct 2014	0.055	Oct 2015	0.055	Oct 2016	-		0.055	0.000	0.350	-
Subtotal			2.958	0.955		0.705		0.705		-		0.705	-	-	-
			Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			67.590	12.685		40.559		30.254		-		30.254	-	-	-
Remarks															

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PE 0604504N: *Air Control*  
Navy

R-1 Line #120

R-1 Program Element (Number/Name)	Program Element Description	Program Element Type	Program Element Status	Program Element Location	Program Element Contact	Program Element Date	Program Element Comments

PE 0604504N / Air Control

0993 / Carrier ATC

Carrier ATC		FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021							
		1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q								
Acquisition Milestones																																	
	Milestones				AN/SPN-50(V)1 MDD ◆																AN/SPN-50(V)1 MSC ▲												
System Development																																	
	Hardware Development	AN/SPN-43C																															
										AN/SPN43 Qual Des & Bld																							
		AN/TPX-42A(V)																															
	Software Development	AN/TPX-42A(V)																															
	Reviews	AN/SPN50(V)1 SRR ■												AN/SPN50(V)1 CDR ■																			

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PE 0604504N: *Air Control*  
Navy

R-1 Line #120

R-1 Program Element (Number/Name)	Program Element Description	Program Element Type	Program Element Status	Program Element Location	Program Element Contact	Program Element Date	Program Element Notes

Project (Number/Name)	Start Date	End Date	Duration (Days)	Project Manager	Status	Notes
101	2023-01-01	2023-01-15	14	John Doe	Completed	Project completed successfully.
102	2023-01-16	2023-02-01	16	Jane Smith	In Progress	On track for completion.
103	2023-02-02	2023-02-15	13	Mike Johnson	On Hold	Waiting for client feedback.
104	2023-02-16	2023-03-01	15	Sarah Lee	Planned	Initial planning phase.
105	2023-03-02	2023-03-15	13	David Kim	Completed	Project completed successfully.
106	2023-03-16	2023-03-31	15	Emily White	In Progress	On track for completion.
107	2023-04-01	2023-04-15	14	Chris Brown	On Hold	Waiting for client feedback.
108	2023-04-16	2023-05-01	15	Alex Green	Planned	Initial planning phase.
109	2023-05-02	2023-05-15	13	Nina Black	Completed	Project completed successfully.
110	2023-05-16	2023-05-31	15	Sam Blue	In Progress	On track for completion.

PE 0604504N / Air Control

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Page/Group/Row	FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q				
Test and Evaluation																												
	AN/TPX-42A(V))																											
Production Milestones																												
	AN/SPN-43C																											
Contract Awards																												
Deliveries																												
																	</											

2017PB - 0604504N - 0993

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2017 Navy			<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604504N / <i>Air Control</i>	<b>Project (Number/Name)</b> 0993 / <i>Carrier ATC</i>	

**Schedule Details**

<b>Events by Sub Project</b>	<b>Start</b>		<b>End</b>	
	<b>Quarter</b>	<b>Year</b>	<b>Quarter</b>	<b>Year</b>
<b><i>Carrier ATC</i></b>				
Acquisition Milestones: Milestones: Material Development Decision (AN/SPN-50(V)1)	4	2015	4	2015
Acquisition Milestones: Milestones: AN/SPN-50(V)1 Milestone C	2	2020	2	2020
System Development: Hardware Development: AN/SPN-43C	1	2015	4	2021
System Development: Hardware Development: Quality Design and Build (AN/SPN43C)	4	2016	3	2021
System Development: Hardware Development: AN/TPX-42A(V)	1	2015	4	2021
System Development: Software Development: AN/TPX-42A(V)	1	2015	4	2021
System Development: Reviews: Critical Design Review (CDR) (AN/SPN-50(V)1)	3	2017	3	2017
System Development: Reviews: System Requirement Review (SRR) (AN/SPN-50)	2	2015	2	2015
<b><i>Page/Group/Row</i></b>				
Test and Evaluation: Developmental Testing/Operational Testing (AN/SPN-50(V)1)	3	2018	4	2019
Test and Evaluation: Developmental Testing (AN/TPX-42A(V))	1	2015	4	2021
Production Milestones: Developmental Testing (AN/SPN-43C)	1	2015	4	2017
Production Milestones: Contract Awards: (AN/SPN-50(V)1) Pre-CDR EDM Contract Award	2	2016	2	2016
Production Milestones: Contract Awards: (AN/SPN-50(V)1) Post-CDR EDM Contract Award	3	2017	3	2017
Deliveries: Pre-CDR Configuration Prototype Delivery (AN/SPN-50(V)1)	2	2017	2	2017
Deliveries: Post-CDR Configuration Prototype Delivery (AN/SPN-50(V)1)	3	2018	3	2018
Deliveries: System Deliveries (TPX-42A(V))	1	2015	4	2021

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy										Date: February 2016		
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0604504N / <i>Air Control</i>				Project (Number/Name) 1657 / <i>ATC Improvement</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
1657: <i>ATC Improvement</i>	2.443	0.604	0.399	0.383	-	0.383	0.406	0.416	0.425	0.434	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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

This program provides for engineering development, integration, adaptation, and testing of new and/or modernized Air Traffic Control (ATC) systems, air navigational aids, landing systems, and ATC communication systems for Naval and Marine Corps Air Stations (NAS/MCAS) and Fleet ATC Systems. These systems are critical to Naval Aviation and provide for safe, efficient air operations. Additionally, the Federal Aviation Administration (FAA) is affecting major modernization of the National Airspace System (NAS). The Navy must maintain compatibility with FAA-developed ATC systems in order to ensure seamless interoperability within the NAS. NAS modernization initiatives in Project 1657 include the Visual Information Display System (VIDS) and follow-on Pre-Planned Product Improvements, with additional RDT&E efforts required for modified commercial-off-the-shelf ATC systems and equipment for modernization and recapitalization of these systems at our NAS, MCAS & Fleet Area Control & Surveillance Facilities (FACSFACs) worldwide. Landing Systems initiatives include re-engineering and technology insertion efforts for the Precision Approach Radar, Tactical Air Navigation System, and other landing systems.

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

	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
<b>Title:</b> NAS MOD VIDS	0.604	0.199	0.191	0.000	0.191
<b>Articles:</b>	-	-	-	-	-
<b>Description:</b> Continue engineering development of pre-planned product improvements for the VIDS and initiate efforts to incorporate VIDS into the FACSFACs. Research display alternatives for Navy ATC systems, and evaluate alternatives for future communication and radar systems.					
<b>FY 2015 Accomplishments:</b> Continue engineering development of Pre-Planned Product Improvements for VIDS to incorporate multiple weather source inputs. Continue Standard Terminal Automation Replacement System and VIDS engineering development for technology insertion. Continue engineering efforts to maintain interoperability with the Federal Aviation Administration's next generation air traffic control system. Complete ATC roadmap development.					
<b>FY 2016 Plans:</b> Continue engineering development of Pre-Planned Product Improvements for VIDS to incorporate multiple weather source inputs. Continue Standard Terminal Automation Replacement System and VIDS engineering development for technology insertion. Continue engineering efforts to maintain interoperability with the FAA next generation air traffic control system.					
<b>FY 2017 Base Plans:</b>					

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy			Date: February 2016			
Appropriation/Budget Activity 1319 / 5		R-1 Program Element (Number/Name) PE 0604504N / Air Control		Project (Number/Name) 1657 / ATC Improvement		
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)		FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
Continue engineering development of Pre-Planned Product Improvements for VIDS to incorporate multiple weather source inputs. Continue Standard Terminal Automation Replacement System and VIDS engineering development for technology insertion. Continue engineering efforts to maintain interoperability with the Federal Aviation Administration (FAA) next generation air traffic control system.  FY 2017 OCO Plans: N/A						
Title: Fleet ATC Systems  Articles:  Description: Research efforts to determine the best technical approach to integrate various data link and communication system upgrades into Navy/Marine Corps ATC Systems including but not limited to the Digital Airport Surveillance Radar into the Fleet Area Control and Surveillance Facilities Fleet Area Control Tracking System (FACTS) 3200 system. Evaluate alternatives for future processor/display, sensor and communication systems.  All FY2015 funding was redirected to support ATC Roadmap development under NASMOD VIDS due to program priorities.  FY 2015 Accomplishments: N/A  FY 2016 Plans: Continue engineering development for NAVSKED/FACTS Technology Refresh and engineering efforts to maintain interoperability with the FAA's next generation air traffic control system.  FY 2017 Base Plans: Continue engineering development for NAVSKED/FACTS Technology Refresh and engineering efforts to maintain interoperability with the FAA's next generation air traffic control system.  FY 2017 OCO Plans: N/A		0.000 -	0.200 -	0.192 -	0.000 -	0.192 -
Accomplishments/Planned Programs Subtotals		0.604	0.399	0.383	0.000	0.383

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<b>Exhibit R-2A, RDT&amp;E Project Justification:</b> PB 2017 Navy	<b>Date:</b> February 2016
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<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604504N / <i>Air Control</i>	<b>Project (Number/Name)</b> 1657 / <i>ATC Improvement</i>
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**C. Other Program Funding Summary (\$ in Millions)**

Line Item	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
• OPN/2840: <i>National Air Space System</i>	26.639	25.621	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	382.785
• OPN/2845: <i>Fleet Air Traffic Control Systems</i>	9.672	8.249	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	211.679
• OPN/2820: <i>Ashore ATC Equipment: NASMOD/Fleet ATC</i>	0.000	0.000	35.498	-	35.498	37.357	37.595	38.219	38.992	Continuing	Continuing

**Remarks**

Ashore ATC Equipment: FY2017-FY2021 reflects NASMOD and Fleet ATC portions of Ashore ATC budget.

**D. Acquisition Strategy**

All projects are non-ACAT upgrades to existing systems. An evolutionary acquisition approach is being used to introduce technology advancements that either satisfy emergent requirements or address supportability and cost of ownership problems.

**E. Performance Metrics**

The Air Traffic Control (ATC) Improvement program goal is to continue to research, evaluate and develop display and other alternatives for Navy ATC, communication and radar systems.

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy												Date: February 2016			
Appropriation/Budget Activity 1319 / 5						R-1 Program Element (Number/Name) PE 0604504N / Air Control				Project (Number/Name) 1657 / ATC Improvement					
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
Primary HDW Develop - VIDS	WR	SPAWAR Systems Command : Charleston, SC	1.142	0.425	Dec 2014	0.199	Dec 2015	0.191	Dec 2016	-		0.191	Continuing	Continuing	Continuing
Primary HDW Develop - Fleet ATC	WR	SPAWAR Systems Center : Charleston, SC	0.544	0.000		0.200	Dec 2015	0.192	Dec 2016	-		0.192	Continuing	Continuing	Continuing
Subtotal			1.686	0.425		0.399		0.383		-		0.383	-	-	-
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
Systems Engineering	WR	SPAWAR Systems Center : Charleston, SC	0.757	0.179	Mar 2015	0.000		0.000		-		0.000	0.000	0.936	-
Subtotal			0.757	0.179		0.000		0.000		-		0.000	0.000	0.936	-
			Prior Years	FY 2015		FY 2016		FY 2017 Base		FY 2017 OCO		FY 2017 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals			2.443	0.604		0.399		0.383		-		0.383	-	-	-
Remarks															



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PE 0604504N: *Air Control*  
Navy

R-1 Line #120

Appropriation/Budget Activity 1319 / 5														R-1 Program Element (Number/Name) PE 0604504N / Air Control								Project (Number/Name) 1657 / ATC Improvement							
ATC Improvement		FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021			
		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																													
Hardware Development		NAS MOD VIDS																											
		Fleet ATC Systems																											

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2017 Navy			<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604504N / <i>Air Control</i>	<b>Project (Number/Name)</b> 1657 / <i>ATC Improvement</i>	

Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b><i>ATC Improvement</i></b>				
System Development: Hardware Development: NAS MOD VIDS	1	2015	4	2021
System Development: Hardware Development: Fleet ATC Systems	1	2016	4	2021

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy										Date: February 2016		
Appropriation/Budget Activity 1319 / 5					R-1 Program Element (Number/Name) PE 0604504N / <i>Air Control</i>				Project (Number/Name) 3372 / <i>ATC Systems</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
3372: <i>ATC Systems</i>	0.000	11.512	15.558	16.453	-	16.453	29.959	21.506	21.499	21.946	Continuing	Continuing
Quantity of RDT&E Articles		-	-	-	-	-	-	-	-	-		

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

The Landing System Upgrade Program (LSUP) is essential to maintain the United States Navy's capability to perform safe and expeditious aircraft landings aboard CVN and LHA/D vessels. The Navy's Precision Approach and Landing Capability requirements have necessitated Life Cycle Extension upgrades to legacy landing systems, AN/SPN-35, AN/SPN-41 and AN/SPN-46. The LSUP program will modernize technology that was developed and fielded over 30 years ago. It is estimated that without these upgrades, the Navy will lose its Automatic Carrier Landing System capability within 5 years.

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

	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
<b>Title:</b> AN/SPN-46 Blk IV Upgrade  <b>Articles:</b>  <b>Description:</b> The AN/SPN-46 Blk IV program targets aging and obsolete components within the carrier landing systems and replaces them with modernized and sustainable components. Blk IV consists of antenna pedestal upgrades, addresses transmitter obsolescence issues, and replacement of obsolete circuit cards.  <b>FY 2015 Accomplishments:</b> Begin hardware and software development of the AN/SPN-46 Blk IV upgrade. Award development contract for addressing part/circuit card obsolescence.  <b>FY 2016 Plans:</b> Continue hardware and software development of the AN/SPN-46 Blk IV upgrade; continue addressing circuit card and other (part) obsolescence issues.  <b>FY 2017 Base Plans:</b> Perform engineering reviews. Begin testing of the AN/SPN-46 Blk IV upgrade.  <b>FY 2017 OCO Plans:</b> N/A	11.512	15.558	13.397	0.000	13.397
<b>Title:</b> AN/SPN-35 Blk I Upgrade  <b>Articles:</b>  <b>Description:</b> This accomplishment provides for the development, upgrade, redesign, integration, and testing of the AN/SPN-35C Block I upgrade. AN/SPN-35C is the Precision Approach Radar aboard LHA/LHD class	0.000	0.000	3.056	0.000	3.056

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy									Date: February 2016				
Appropriation/Budget Activity 1319 / 5				R-1 Program Element (Number/Name) PE 0604504N / Air Control				Project (Number/Name) 3372 / ATC Systems					
B. Accomplishments/Planned Programs (\$ in Millions, Article Quantities in Each)									FY 2015	FY 2016	FY 2017 Base	FY 2017 OCO	FY 2017 Total
ships and is used for Mode III aircraft recovery which ensures the safe approach and landing of AV-8B and various helicopters during adverse weather & night conditions. The AN/SPN-35C Block I upgrade will include engineering efforts to upgrade, redesign, replace, and support, common failure items, obsolete components, analog systems ensuring the their availability to the fleet and extending the service life of the AN/SPN-35C to 2040.													
FY 2015 Accomplishments: N/A													
FY 2016 Plans: N/A													
FY 2017 Base Plans: The AN/SPN-35C Block I upgrade FY2017 efforts will include the system engineering investigation & analysis, development, upgrade, and redesign of the AN/SPN-35C Pedestal, stabilization, ferrite switch, receiver, and antenna drives.													
FY 2017 OCO Plans: N/A													
Accomplishments/Planned Programs Subtotals									11.512	15.558	16.453	0.000	16.453
C. Other Program Funding Summary (\$ in Millions)													
Line Item	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		
• OPN/2832: Automatic Carrier Landing System	21.357	21.281	0.000	-	0.000	0.000	0.000	0.000	0.000	0.000	155.476		
• OPN/2830: Afloat ATC Equipment/ACLS	0.000	0.000	24.999	-	24.999	35.786	39.680	40.260	41.091	Continuing	Continuing		
Remarks													
Afloat ATC Equipment: FY2017-FY2021 reflects ACLS portion of Afloat ATC Equipment budget.													
D. Acquisition Strategy													
Landing System Upgrade Program consists of lifecycle extension upgrades to the AN/SPN-35C Precision Approach Radar, AN/SPN-41B Instrument Control Landing Systems and AN/SPN-46 Automatic Carrier Landing Systems which support Air Traffic Control (ATC) operations on board CVN, LHA, and/or LHD-class ships. This effort includes numerous commercial off-the-shelf (COTS) component refresh updates which are urgently needed to sustain the operational viability of these Naval ATC													

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Exhibit R-2A, RDT&E Project Justification: PB 2017 Navy		Date: February 2016
Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604504N / <i>Air Control</i>	Project (Number/Name) 3372 / <i>ATC Systems</i>
<p>systems supporting fleet air operations for at least the next 15 years until the next generation ATC system is fully implemented. This COTS refresh will include analysis and upgrade of key system components that are critical to overall system operation but have become increasingly difficult to maintain over the past few years. Recent adjustments in the direction and scope of Naval ATC systems have necessitated a re-evaluation of the long-term viability and sustainability of the current Fleet ATC equipment.</p> <p>The Resources and Requirements Review Board approved the DON Precision Approach and Landing Capability (PALC) Roadmap per Decision Memorandum (DM) Ser: N8B/13U141053 dtd 03 July 2013. This PALC Roadmap re-scoped Joint Precision Approach and Landing System (JPALS) into a single increment and delayed deployment of the JPALS capability to the Fleet. As a result, a requirement to upgrade current SPNs has emerged. Per Enclosure 1 of the above DM, the Landing Systems Upgrade Program will be comprised of the AN/SPN-46, AN/SPN-35C, and AN/SPN-41B and is anticipated that each SPN upgrade will go through separate Material Development Decisions and Milestones.</p> <p><b>E. Performance Metrics</b></p> <p>Critical Design Review of the AN/SPN-46 Blk IV upgrade.</p>		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2017 Navy												Date: February 2016			
Appropriation/Budget Activity 1319 / 5						R-1 Program Element (Number/Name) PE 0604504N / Air Control				Project (Number/Name) 3372 / ATC Systems					
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
Primary Hardware Development - AN/SPN-46 Blk IV Upgrade	WR	NAWCAD : Patuxent River, MD	0.000	3.467	Jan 2015	6.877	Nov 2015	6.914	Nov 2016	-		6.914	Continuing	Continuing	Continuing
Ancillary Hardware Development - AN/SPN-46 Blk IV Upgrade	C/CPFF	Sierra Nevada Corp (SNC) : Reno, NV	0.000	7.300	Apr 2015	6.958	Dec 2015	5.101	Dec 2016	-		5.101	Continuing	Continuing	Continuing
Primary Hardware Development - AN/SPN-35 Blk I Upgrade	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.000		2.026	Nov 2016	-		2.026	Continuing	Continuing	Continuing
Ancillary Hardware Development - AN/SPN-35 Blk I Upgrade	TBD	TBD : TBD	0.000	0.000		0.000		0.272	Apr 2017	-		0.272	Continuing	Continuing	Continuing
Subtotal			0.000	10.767		13.835		14.313		-		14.313	-	-	-
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
Integrated Logistics Support (ILS)	WR	NAWCAD : Patuxent River, MD	0.000	0.200	Jan 2015	0.242	Nov 2015	0.495	Nov 2016	-		0.495	Continuing	Continuing	Continuing
Systems Engineering Support	WR	NAWCAD : Patuxent River, MD	0.000	0.145	Jan 2015	0.689	Nov 2015	0.720	Nov 2016	-		0.720	Continuing	Continuing	Continuing
Subtotal			0.000	0.345		0.931		1.215		-		1.215	-	-	-
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
AN/SPN-46 Blk IV Upgrade	WR	NAWCAD : Patuxent River, MD	0.000	0.000		0.187	Nov 2015	0.305	Nov 2016	-		0.305	Continuing	Continuing	Continuing
Subtotal			0.000	0.000		0.187		0.305		-		0.305	-	-	-

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<b>Exhibit R-3, RDT&amp;E Project Cost Analysis: PB 2017 Navy</b>												<b>Date:</b> February 2016			
<b>Appropriation/Budget Activity</b> 1319 / 5						<b>R-1 Program Element (Number/Name)</b> PE 0604504N / <i>Air Control</i>				<b>Project (Number/Name)</b> 3372 / <i>ATC Systems</i>					
<b>Management Services (\$ in Millions)</b>				<b>FY 2015</b>		<b>FY 2016</b>		<b>FY 2017 Base</b>		<b>FY 2017 OCO</b>		<b>FY 2017 Total</b>			
<b>Cost Category Item</b>	<b>Contract Method &amp; Type</b>	<b>Performing Activity &amp; Location</b>	<b>Prior Years</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Award Date</b>	<b>Cost</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
Program Management (PM) Support	WR	NAWCAD : Patuxent River, MD	0.000	0.300	Jan 2015	0.502	Nov 2015	0.510	Nov 2016	-		0.510	Continuing	Continuing	Continuing
PM Suppt - MSS	C/CPAF	TBD : Patuxent River, MD	0.000	0.100	Jan 2015	0.103	Nov 2015	0.110	Nov 2016	-		0.110	Continuing	Continuing	Continuing
<b>Subtotal</b>			0.000	0.400		0.605		0.620		-		0.620	-	-	-
			<b>Prior Years</b>	<b>FY 2015</b>		<b>FY 2016</b>		<b>FY 2017 Base</b>		<b>FY 2017 OCO</b>		<b>FY 2017 Total</b>	<b>Cost To Complete</b>	<b>Total Cost</b>	<b>Target Value of Contract</b>
<b>Project Cost Totals</b>			0.000	11.512		15.558		16.453		-		16.453	-	-	-
<b>Remarks</b>															

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PE 0604504N: *Air Control*  
Navy

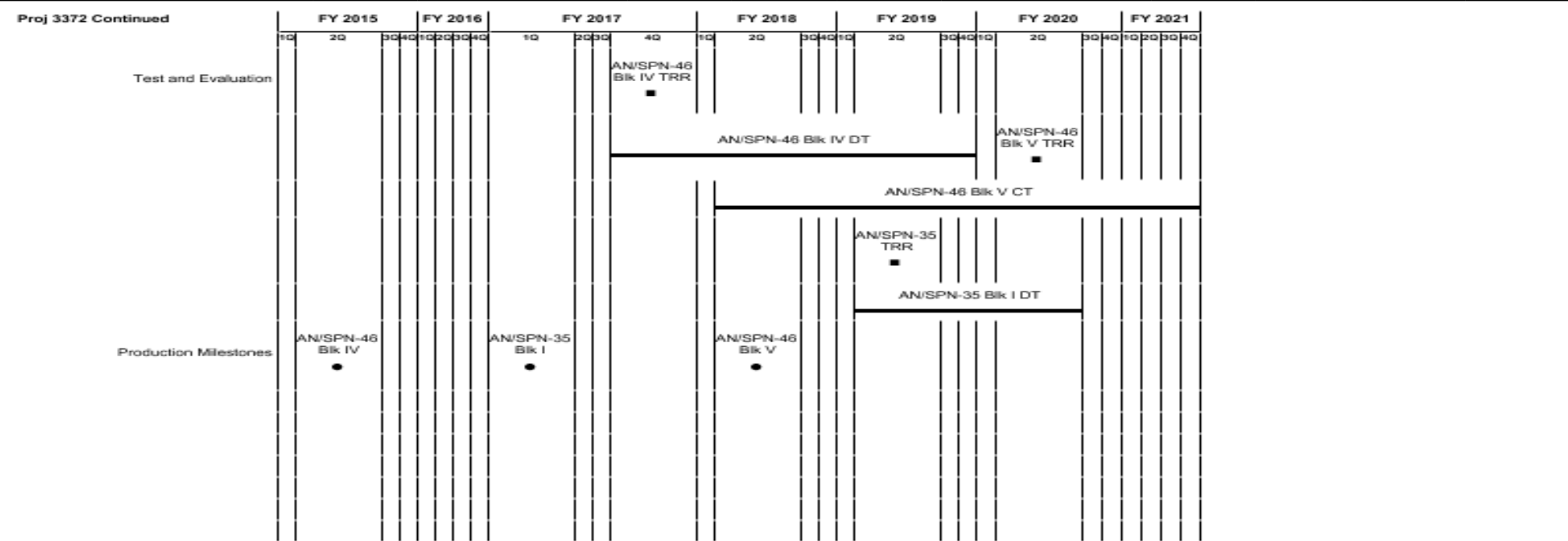
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**Project (Number/Name)**  
3372 / ATC Systems





Appropriation/Budget Activity 1319 / 5	R-1 Program Element (Number/Name) PE 0604504N / Air Control	Project (Number/Name) 3372 / ATC Systems
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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2017 Navy			<b>Date:</b> February 2016
<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604504N / <i>Air Control</i>	<b>Project (Number/Name)</b> 3372 / <i>ATC Systems</i>	

**Schedule Details**

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b>Proj 3372</b>				
Acquisition Milestones: MDD AN/SPN-46 Blk V	4	2017	4	2017
Acquisition Milestones: MDD AN/SPN-35 Blk I	4	2016	4	2016
Acquisition Milestones: MDD AN/SPN-35 Blk II	4	2019	4	2019
Acquisition Milestones: MDD AN/SPN-41 Blk I	4	2019	4	2019
Systems Development: AN/SPN-46 Blk IV H/W and S/W Dev	2	2015	3	2017
Systems Development: AN/SPN-46 Blk V H/W and S/W Dev	2	2018	2	2020
Systems Development: AN/SPN-35 Blk I H/W and S/W Dev	2	2017	2	2019
Systems Development: AN/SPN-35 Blk II H/W and S/W Dev	2	2020	4	2021
Systems Development: AN/SPN-41 Blk I H/W and S/W Dev	1	2020	4	2021
Reviews: AN/SPN-46 Blk IV Preliminary Design Review (PDR)	1	2016	1	2016
Reviews: AN/SPN-46 Blk IV Critical Design Review (CDR)	1	2017	1	2017
Reviews: AN/SPN-46 Blk V Preliminary Design Review (PDR)	1	2019	1	2019
Reviews: AN/SPN-46 Blk V Critical Design Review (CDR)	3	2019	3	2019
Reviews: AN/SPN-35 Blk I Preliminary Design Review (PDR)	4	2017	4	2017
Reviews: AN/SPN-35 Blk I Critical Design Review (CDR)	2	2018	2	2018
Reviews: AN/SPN-35 Blk II Preliminary Design Review (PDR)	3	2020	3	2020
Reviews: AN/SPN-35 Blk II Critical Design Review (CDR)	2	2021	2	2021
Reviews: AN/SPN-41 Blk I Preliminary Design Review (PDR)	3	2020	3	2020
Reviews: AN/SPN-41 Blk I Critical Design Review (CDR)	3	2021	3	2021
<b>Proj 3372 Continued</b>				
Test and Evaluation: An/SPN-46 Blk IV Test Readiness Review (TRR)	4	2017	4	2017
Test and Evaluation: AN/SPN-46 Blk IV Development Testing(DT)	4	2017	4	2019

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<b>Exhibit R-4A, RDT&amp;E Schedule Details:</b> PB 2017 Navy	<b>Date:</b> February 2016
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<b>Appropriation/Budget Activity</b> 1319 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604504N / <i>Air Control</i>	<b>Project (Number/Name)</b> 3372 / <i>ATC Systems</i>
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Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Test and Evaluation: AN/SPN-46 Blk V Test Readiness Review (TRR)	2	2020	2	2020
Test and Evaluation: AN/SPN-46 Blk V Development Testing (DT)	2	2018	4	2021
Test and Evaluation: AN/SPN-35 Blk I Test Readiness Review (TRR)	2	2019	2	2019
Test and Evaluation: AN/SPN-35 Blk I Development Testing(DT)	2	2019	2	2020
Production Milestones: Contract Award AN/SPN-46 Blk IV	2	2015	2	2015
Production Milestones: Contract Award AN/SPN-46 BLK V	2	2018	2	2018
Production Milestones: Contract Award AN/SPN-35 Blk I	1	2017	1	2017

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