Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Navy											DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*				R-1 ITEM NOMENCLATURE PE 0603879N: *Single Int Air Picture (SIAP) Sys Eng*							
COST ($ in Millions)	**FY 2009 Actual**	**FY 2010 Estimate**	**FY 2011 Base Estimate**	**FY 2011 OCO Estimate**	**FY 2011 Total Estimate**	**FY 2012 Estimate**	**FY 2013 Estimate**	**FY 2014 Estimate**	**FY 2015 Estimate**	**Cost To Complete**	**Total Cost**
Total Program Element	40.587	52.497	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	362.275
3031: *Single Integrated Air Picture Sys Eng*	40.587	52.497	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	362.275

A. Mission Description and Budget Item Justification

At the direction of the Office of the Secretary of Defense and working in conjunction with the Joint Program Executive Office (JPEO) SIAP and Army Integrated Air and Missile Defense (IAMD) Program, the Navy mission is to support the design, development, testing and fielding of a SIAP capability which satisfies requirements mandated by the Global
Information Grid (GIG), Theater Air and Missile Defense (TAMD) and Combat Identification (CID) Mission Area Initial Capabilities Documents (MA-ICD). The Undersecretary of Defense Acquisition Memorandum of 3 May 06 validated the requirement for a SIAP capability and concurs with the Navy-designated Pathfinder programs identified for SIAP implementation. VCNO for Resources, Requirements, and Assessments (N8) SIAP implementation guidance of 14 March 06 defines requirements to the Navy to implement the SIAP. On 24 September 2007, the Joint Requirements Oversight Council (JROC) approved the Capability Development Document (CDD) establishing official requirements for the SIAP program.

The SIAP capability will provide the Navy warfighter with the ability to better understand the joint battlespace and employ weapons to the full extent of their designed capabilities. The SIAP will support the spectrum of offensive and defensive operations by US, allied, and coalition partners in the airspace within a theater of operations (e.g., attack operations, suppression of enemy air defenses, air and missile defense, intelligence preparation of the battlefield). The SIAP is accomplished through a combination of materiel and nonmaterial improvements. This effort through the application of disciplined System Engineering processes, policies, products and services will enable delivery of an integrated, interoperable, reliable, and maintainable Joint SIAP capability in Navy warfare systems/platforms, in the support of Joint and Navy Mission Capabilities.

SIAP capability is being introduced through a series of improvements, targeted at eliminating specific interoperability issues, and providing Command, Control, Communications, Computers, & Intelligence (C4I) enhancements. The engineering specifications and requirements developed by the engineering efforts will be incorporated into successive versions. The delivered capability will be used to develop the successive versions of the platform specific applications to be implemented in Navy combat systems requiring the Joint SIAP capability. The IABM will also be used as a standard against which to assess performance of the Navy combat systems in terms of Joint Force interoperability. The Navy is investing in the Open Architecture (OA) construct for many reasons, one of which is to create the combat system computing architecture which will permit the most rapid and least expensive implementation of the SIAP capability and other Joint applications. To that end, this effort also provides some resources to the OA system engineering process.

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APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 ITEM NOMENCLATURE** PE 0603879N: *Single Int Air Picture (SIAP) Sys Eng*

Implementation of a SIAP capability in the Navy combat systems, will reduce risk of fratricide to US/coalition forces caused by incorrect correlation and ID association and enable warfighters to exploit the full kinematic range of their weapons through better Joint Force integration. This PE provides the resources for the Navy Programs of Record for integration of the Joint SIAP solution, and funding for the implementation of the SIAP capability into the Aegis combat system leveraging the Guided Missile Destroyer (DDG) Modernization Program.

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	41.568	52.716	0.000	0.000	0.000
Current President's Budget	40.587	52.497	0.000	0.000	0.000
Total Adjustments	-0.981	-0.219	0.000	0.000	0.000
• Congressional General Reductions		-0.219			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		0.000			
• Congressional Directed Transfers		0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.981	0.000			
• Program Adjustments	0.000	0.000	0.000	0.000	0.000

Change Summary Explanation

Technical: Not applicable.

Schedule: Not applicable.

FY11 from previous President's Budget is shown as zero because no FY11-15 data was presented in President's Budget 2010.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 1319: *Research, Development, Test & Evaluation, Navy* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	R-1 ITEM NOMENCLATURE PE 0603879N: *Single Int Air Picture (SIAP) Sys Eng*	PROJECT 3031: *Single Integrated Air Picture Sys Eng*	

COST ($ in Millions)	FY 2009 Actual	FY 2010 Estimate	FY 2011 Base Estimate	FY 2011 OCO Estimate	FY 2011 Total Estimate	FY 2012 Estimate	FY 2013 Estimate	FY 2014 Estimate	FY 2015 Estimate	Cost To Complete	Total Cost
3031: *Single Integrated Air Picture Sys Eng*	40.587	52.497	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	362.275
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

At the direction of the Office of the Secretary of Defense and working in conjunction with the SIAP Joint Program Office (JPO), the Navy mission is to support the design, development, testing and fielding of a SIAP capability which satisfies requirements mandated by the Global Information Grid (GIG), Theater Air and Missile Defense (TAMD) and Combat Identification (CID) Mission Area Initial Capabilities Documents (MA-ICD). The Undersecretary of Defense Acquisition Memorandum of 3 May 06 validated the requirement for a SIAP capability and concurs with the Navy-designated Pathfinder programs identified for SIAP implementation. VCNO for Resources, Requirements, and Assessments (N8) SIAP implementation guidance of 14 March 06 directs the Navy to implement the SIAP program product, Integrated Architecture Behavior Model (IABM), in the following Navy pathfinder programs: Aegis Cruisers and Destroyers, Hawkeye Aircraft (E-2), and Ship Self Defense System (SSDS) platforms. On 24 September 2007, the Joint Requirements Oversight Council (JROC) approved the Capability Development Document (CDD) establishing official requirements for the SIAP program.

The SIAP capability will provide the Navy warfighter with the ability to better understand the joint battlespace and employ weapons to the full extent of their designed capabilities. The SIAP will support the spectrum of offensive and defensive operations by US, allied, and coalition partners in the airspace within a theater of operations (e.g., attack operations, suppression of enemy air defenses, air and missile defense, intelligence preparation of the battlefield). The SIAP is accomplished through a combination of materiel and nonmaterial improvements. This effort through the application of disciplined System Engineering processes, policies, products and services will enable delivery of an integrated, interoperable, reliable, and maintainable Joint SIAP capability in Navy warfare systems/platforms, in the support of Joint and Navy Mission Capabilities.

SIAP capability is being introduced through a series of improvements called Capability Drops, targeted at eliminating specific interoperability issues, providing Command, Control, Communications, Computers, & Intelligence (C4I) enhancements, and delivering an executable integrated architecture. The engineering specifications and requirements developed by the engineering efforts will be incorporated into the successive versions of the Joint IABM in a spiral development improvement process. The delivered IABM will be used to develop the successive versions of the platform specific applications to be implemented in Navy combat systems requiring the Joint SIAP capability. The IABM will also be used as a standard against which to assess performance of the Navy combat systems in terms of Joint Force interoperability. The Navy is investing in the Open Architecture (OA) construct for many reasons, one of which is to create the combat system computing

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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architecture which will permit the most rapid and least expensive implementation of the IABM and other Joint applications. To that end, this effort also provides some resources to the OA system engineering process.

Implementation of a platform specific application in the Navy Pathfinder combat systems (E-2, Aegis, and SSDS), will reduce risk of fratricide to US/coalition forces caused by incorrect correlation and ID association and enable warfighters to exploit the full kinematic range of their weapons through better Joint Force integration. This PE provides the resources for the Navy system engineering support to the Joint effort to develop SIAP capability, system engineering support to Navy Pathfinder Programs of Record (E-2, Aegis, SSDS) for integration of the Joint SIAP solution, and funding for the implementation of the IABM into the Aegis combat system leveraging the Guided Missile Destroyer (DDG) Modernization program.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
SIAP ENGINEERING REQUIREMENTS AND ARCHITECTURE ALIGNMENT	1.868	1.516	0.000	0.000	0.000
FY 2009 Accomplishments: FY09: Continue to refine the systems requirements baseline for the additional capabilities in IABM CD-1 Follow-On (FO) for fielding the IABM into the Navy Pathfinder combat systems (Aegis, E-2, and SSDS). Update and finalize CD-1 FO interface specifications in support of adaptation and interface development for the IABM and Navy Pathfinder systems. Support system development and the System Engineering Review Process for additional IABM CD-1 FO capabilities. Develop pathfinder's adaptation layer phasing plans (phasing and mapping of the CD-1 FO Derived System Requirements) and complete associated Host Interface Description Documents. Support interface and architecture specifications in support of the IABM CD-1 FO Design Preliminary Design Review (PDR) and address revised functional alignment of Navy Pathfinder systems. *FY 2010 Plans:* FY10: Establish a Multi-Service System Engineering (MSSE) team to determine what near term improvements are feasible with the Navy and other Services current Programs of Record (PoRs). This effort will lead to determining what JTM functionality must be common, consistent, or interoperable. By working together in a Joint environment, the Services can determine which of these functionalities can be developed in a manner consistent with the PoR schedule requirements.					

Exhibit R-2A, RDT&E Project Justification: PB 2011 Navy		DATE: February 2010
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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
SIAP SYSTEM DEVELOPMENT	12.065	9.270	0.000	0.000	0.000

FY 2009 Accomplishments:

FY09: Support IABM CD-1 FO domain development in the areas of composite tracking capability and CEC interoperability (CEC Data Manager) and support the SIAP JPO Rapid Capability Insertion Process (RCIP) in examining Science and Technology (S&T) insertion efforts such as Distributed Multiple-Sensor Integration, Distributed Multiple-Hypothesis Tracking, Air Tasking Order / Airspace Control Order (ATO/ACO) Associator, and Automated Battle Management Aids (Distributed Weapons Coordination (DWC)). Migrate the developed prototype level interfaces and Adaptation Layers (AL) towards production level in parallel with CD-1 FO development (Time Boxes) to enable integration into Aegis and E-2 Hawkeye 2000 for SIAP Initial Operating Capability (IOC). Continue CD-1 FO prototype Adaptation Layer and interface development for Sensors (SPY OA, UPX 29, SPQ 9B, APS 145, and OL-483/AP) and TDLs (JTAL). Convert, adapt, and integrate IABM CD-1 into platform specific implementations in Aegis and E-2 Hawkeye 2000 programs to enable Navy platform Test and Evaluation (T&E) events (E-2 and Aegis Integration Testing) as well as Joint T&E events (JCHE-5).

FY 2010 Plans:

FY10: In a joint environment, under the direction of the JPEO SIAP, the Navy will collaborate in the development of a Joint Track Management (JTM) Capability towardsaccommodating the SIAP CDD. JTM capability will use existing technologies combined with current systems to provide an enhanced capability for the warfighter in the area of Joint Integrated Air and Missile Defense. The Navy will work collaboratively with the JPEO and Army to achieve incremental development of a JTM capability to support the warfighter. In order to support Joint Interoperability at the JTM capability level, Navy will initially focus efforts on pre-existing Tactical Data Link (TDL) - Cooperative Engagement Capability (CEC) fixes (ie - Fleet System Engineering Council (FSEC) fixes) to existing baselines. This is a required step towards meeting SIAP CDD requirements via the JTM capability. Initial efforts will address interoperability issues associated with the Fleet's inability to command and control forces and conduct defense of the force. The following prioritized list of issues to correct this shortfall will be addressed with this effort:

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
- CEPN/LTN Mismatch - High/Low IU and LTN Processing - Link Track Correlation - TDL Filtering Limits - ID Management - IFF Mode 5					
SIAP TEST PLANNING AND EXECUTION *FY 2009 Accomplishments:* FY09: Perform, element, platform, and System of System level testing to include: - Update SIAP CD-1 and CD-1 FO Test and Evaluation (T&E) documentation in support of the SIAP Acquisition Milestones. - Continue development of T&E Metrics and Data Set - Plan and execute Engineering Assessments of the IABM to support fielding of the IABM CD-1 Follow-On. - Support CD-1 Operational Assessment - Assist with JTIC conformance testing - Develop plan for conducting CEC Backward Compatibility test using near-target AMOD and E-2 hardware configurations - Complete T&E planning and conduct execution of Navy SIAP IV&V and Navy participation in Joint Combined Hardware-in-the-loop Evaluation (JCHE-5) events.	5.729	0.000	0.000	0.000	0.000
SIAP INTEGRATION COORDINATION & PLANNING *FY 2009 Accomplishments:* FY09: For yearly SIAP DAB milestones, update documentation for Capability Development Document (CDD), Acquisition Program Baseline (APB), Program Protection Plan (PPP), Information Support Plan (ISP) and update Cost Analysis Requirements Document (CARD), Program Life Cycle Cost Estimate	1.673	1.481	0.000	0.000	0.000

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
(PLCCE), Independent Cost Estimate (ICE), Systems Engineering Plan (SEP), and Acquisition Strategy (AS). Conduct planning for risk mitigation and configuration management activities. Monitor and support execution of the Navy SIAP Implementation Plan (IP). *FY 2010 Plans:* FY10: Produce and update documentation consistent with Milestone requirements that the Joint Track Manager development requires.					
DDG MOD PLATFORM SPECIFIC MODEL *FY 2009 Accomplishments:* FY09: Specific FY09 activity includes: Aegis SIAP Requirements and Architecture: Establish an allocated Baseline that includes JTM alignment by PDR. Define common data model and coordinated interfaces for the enterprise track server and the common track manager components for surface Navy combat systems, including component framework Application Programmer Interfaces (APIs), host services APIs, track server APIs from a client perspective, Sensor Adaptation Layer component IDDs, and system track management APIs for the host to use. Develop and/or review requirements and design products and contribute to coordinated Navy comments on SIAP JPO baseline products and other SIAP PDR artifacts, as well as the JAWG JTM SV-4. JCHE-5: Develop a prototype SPY adaptation layer to support JCHE-5 that interfaces with the SPY OA Radar control program and the IABM. Deliver associated SPY SAL B-5 level requirements. Coordinate with NSWC/DD for upgrades to the ASATS simulation to model the SPY OA radar variant planned for AMOD in preparation for JCHE-5. Complete integration of the SPY, SPQ 9B, and UPX-29 adaptation layers with the IABM CD-1 in preparation for JCHE-5. *FY 2010 Plans:* FY10: Perform the development and integration tasks required to support the Navy in the development and integration of the two common Track Manager components, System Track Manager (STM) and Track Server (TS) into AMOD ACB 12. The two components are being developed by a third party	19.050	40.230	0.000	0.000	0.000

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B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Systems Integrator / Design Agent (SI/DA). Under this effort, work with the SI/DA to integrate and jointly test the two components being developed in support of the ACB 12 Program. The technical focus of this effort is to conduct the required system engineering and associated development using the Aegis AMOD ACB 12 architecture as a base foundation and to implement Track Management architecture and interface changes in accordance with the Component Architecture SV-4.					
DAWDF *FY 2009 Accomplishments:* Acquisition Workforce	0.202	0.000	0.000	0.000	0.000
Accomplishments/Planned Programs Subtotals	40.587	52.497	0.000	0.000	0.000

C. Other Program Funding Summary ($ in Millions)

N/A

D. Acquisition Strategy

The Navy is committed to implementing the SIAP capability into Navy platforms as functionality matures and system programmatic considerations (funding and schedules) permit. Individual Programs of Record implementation will allow identification and resolution of key technical, operational and programmatic issues, and provide lessons learned for
future integration into Navy systems which have approved SIAP requirements. Implementation in Aegis, E-2, and SSDS platforms will occur per the Office of the Chief of Naval Operations (OPNAV) N8 SIAP Requirements letter and during scheduled software upgrades, to the extent feasible. This implementation of the capability into Navy platforms will
occur upon demonstration of certain critical factors and assumptions.

E. Performance Metrics

Milestone Reviews