Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Air Force										DATE: February 2010	
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*				R-1 ITEM NOMENCLATURE PE 0305114F: *Air Traffic Control/Approach/Landing System (ATCALS)*							
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	8.796	11.313	33.268	0.000	33.268	57.727	7.525	2.690	2.734	Continuing	Continuing
673587: *Air Traffic Control Systems*	8.796	11.313	33.268	0.000	33.268	57.727	7.525	2.690	2.734	Continuing	Continuing

A. Mission Description and Budget Item Justification

To support the Air Force worldwide flying mission, this program element funds research, development and management of new air traffic control surveillance, positioning, and precision approach landing systems. When applicable, this includes joint efforts with the Federal Aviation Administration (FAA) and coordination with the International Civil Aviation Organization (ICAO) and the North Atlantic Treaty Organization (NATO). FY11 funding focuses on three main efforts as follows:

Deployable Instrument Landing System (D-ILS). This effort develops a deployable version of the fixed base ILS which is the standard precision approach and landing system for conducting Air Force contingency operations and humanitarian or domestic disaster restoral operations in adverse weather conditions. The current Air Force mobile precision approach radar system (PAR) used to support operations at deployed locations are highly limited and have a decreasing operational availability. Only about 16% of the mobile PAR systems, which were procured in the 1970s and are manpower intensive and logistically unsupportable, are operational. Development and deployment of D-ILS will support increased operations in the AOR, allow phase out of the currently obsolete legacy systems and will provide interoperability with the Civil Reserve Air Fleet (CRAF). FY11 funds continue development and deployment of the D-ILS. Related OPAF funds are in PE 0305114F.

Deployable Radar Approach Control (D-RAPCON). D-RAPCON will replace the 40 year old AN/MPN-14K and AN/TPN-19 Airport Surveillance Radar (ASR) and Operations Shelter (OPS) subsystems with state of the art digital systems. Modification and overhaul of the existing systems have proven to be ineffective due to diminishing manufacturing sources over the 40 years for some of the components and subsystems. The D-RAPCON will be used to provide both a terminal and enroute surveillance capability. The D-RAPCON may also be used with a precision approach landing system and control tower to provide a complete ATC capability. The D-RAPCON will support tactical military operations and also provide a capability to support domestic disaster relief. The new digital technology will also provide the capability to transmit and display surveillance radar data to/from other sensors and command and control nodes. The primary surveillance radar coverage (non-cooperative targets) is out to 60 nautical miles (nm)and the secondary surveillance radar coverage (cooperative targets) is out to 120 nm. FY11 funds will support the award of an engineering and manufacturing development contract for the D-RAPCON. Related OPAF funds are in PE 0305114F.

Next Generation Air Transportation System (NextGen): This is an interagency effort designed to enable the transition from a ground infrastructure dominated Air Traffic Management capability for the U.S. National Airspace System (NAS) to a capability that leverages advances in Performance Based Navigation (PBN), non-radar based surveillance services, transition from voice communications to digital data exchange, as well as advances in weather forecast delivery systems.

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Air Force	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*	**R-1 ITEM NOMENCLATURE** PE 0305114F: *Air Traffic Control/Approach/Landing System (ATCALS)*

NextGen will be built on key elements from existing programs and technologies and on new systems under development. FY11 efforts will focus on preparations leading to the implementation of new surveillance technologies including Automatic Dependent Surveillance - Broadcast (ADS-B) and multilateration systems utilizing transponder technologies. Both will improve the display of aircraft position to air traffic managers and will enhance flight safety. Early efforts will focus on analysis and demonstration of technologies to enable the seamless integration of Remotely Piloted Aircraft (RPA) into the NAS and the airspaces of other nations. Design studies and engineering analysis will be initiated to ensure ground system upgrades are coordinated and fielded concurrently with aircraft avionics capabilities that are acquired and integrated into Air Force aircraft and RPA; these efforts will run in close parallel with the Communication, Navigation and Surveillance/Air Traffic Management (CNS/ATM) program.

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	10.796	9.006	0.000	0.000	0.000
Current President's Budget	8.796	11.313	33.268	0.000	33.268
Total Adjustments	-2.000	2.307	33.268	0.000	33.268
• Congressional General Reductions		-0.093			
• Congressional Directed Reductions		0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds		2.400			
• Congressional Directed Transfers		0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	0.000	0.000			
• Other Adjustments	-2.000	0.000	33.268	0.000	33.268

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2009	FY 2010
Project: 673587: *Air Traffic Control Systems*		
Congressional Add: *Continues development and testing of the Tactical Transponser Landing System (TTLS).*	4.000	2.400
Congressional Add Subtotals for Project: 673587	4.000	2.400
Congressional Add Totals for all Projects	4.000	2.400

Change Summary Explanation

FY11 funds programmed for NextGen system development. Congressional add of $2.400M for Tactical Transponder Landing System (TTLS)

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Air Force	DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*	**R-1 ITEM NOMENCLATURE** PE 0305114F: *Air Traffic Control/Approach/Landing System (ATCALS)*

FY11 D-RAPCON and D-ILS fully funded based on updated cost estimates and revised schedules

Exhibit R-2A, RDT&E Project Justification: PB 2011 Air Force			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305114F: *Air Traffic Control/Approach/ Landing System (ATCALS)*	PROJECT 673587: *Air Traffic Control Systems*	

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
673587: *Air Traffic Control Systems*	8.796	11.313	33.268	0.000	33.268	57.727	7.525	2.690	2.734	Continuing	Continuing
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

To support the Air Force worldwide flying mission, this program element funds research, development and management of new air traffic control surveillance, positioning, and precision approach landing systems. When applicable, this includes joint efforts with the Federal Aviation Administration (FAA) and coordination with the International Civil Aviation Organization (ICAO) and the North Atlantic Treaty Organization (NATO). FY11 funding focuses on three main efforts as follows:

Deployable Instrument Landing System (D-ILS). This effort develops a deployable version of the fixed base ILS which is the standard precision approach and landing system for conducting Air Force contingency operations and humanitarian or domestic disaster restoral operations in adverse weather conditions. The current Air Force mobile precision approach radar system (PAR) used to support operations at deployed locations are highly limited and have a decreasing operational availability. Only about 16% of the mobile PAR systems, which were procured in the 1970s and are manpower intensive and logistically unsupportable, are operational. Development and deployment of D-ILS will support increased operations in the AOR, allow phase out of the currently obsolete legacy systems and will provide interoperability with the Civil Reserve Air Fleet (CRAF). FY11 funds continue development and deployment of the D-ILS. Related OPAF funds are in PE 0305114F.

Deployable Radar Approach Control (D-RAPCON). D-RAPCON will replace the 40 year old AN/MPN-14K and AN/TPN-19 Airport Surveillance Radar (ASR) and Operations Shelter (OPS) subsystems with state of the art digital systems. Modification and overhaul of the existing systems have proven to be ineffective due to diminishing manufacturing sources over the 40 years for some of the components and subsystems. The D-RAPCON will be used to provide both a terminal and enroute surveillance capability. The D-RAPCON may also be used with a precision approach landing system and control tower to provide a complete ATC capability. The D-RAPCON will support tactical military operations and also provide a capability to support domestic disaster relief. The new digital technology will also provide the capability to transmit and display surveillance radar data to/from other sensors and command and control nodes. The primary surveillance radar coverage (non-cooperative targets) is out to 60 nautical miles (nm)and the secondary surveillance radar coverage (cooperative targets) is out to 120 nm. FY11 funds will support the award of an engineering and manufacturing development contract for the D-RAPCON. Related OPAF funds are in PE 0305114F.

Next Generation Air Transportation System (NextGen): This is an interagency effort designed to enable the transition from a ground infrastructure dominated Air Traffic Management capability for the U.S. National Airspace System (NAS) to a capability that leverages advances in Performance Based Navigation (PBN), non-radar based surveillance services, transition from voice communications to digital data exchange, as well as advances in weather forecast delivery systems.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Air Force		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305114F: *Air Traffic Control/Approach/ Landing System (ATCALS)*	PROJECT 673587: *Air Traffic Control Systems*

NextGen will be built on key elements from existing programs and technologies and on new systems under development. FY11 efforts will focus on preparations leading to the implementation of new surveillance technologies including Automatic Dependent Surveillance - Broadcast (ADS-B) and multilateration systems utilizing transponder technologies. Both will improve the display of aircraft position to air traffic managers and will enhance flight safety. Early efforts will focus on analysis and demonstration of technologies to enable the seamless integration of Remotely Piloted Aircraft (RPA) into the NAS and the airspaces of other nations. Design studies and engineering analysis will be initiated to ensure ground system upgrades are coordinated and fielded concurrently with aircraft avionics capabilities that are acquired and integrated into Air Force aircraft and RPA; these efforts will run in close parallel with the Communication, Navigation and Surveillance/Air Traffic Management (CNS/ATM) program.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
MAJOR THRUST: Continues efforts to implement NextGen efficiencies and capabilities. Current efforts focus on integrating Remotely Piloted Aircraft (RPAs) in to the NAS and multlateration technol... *FY 2009 Accomplishments:* In FY 2009: N/A *FY 2010 Plans:* In FY 2010: Begin analysis of Ground Based Sense and Avoid (GBSAA) technology to support seamless integration of RPAs into civil airspace and conduct multilateration system demonstrations to evaluate system set-up times, logistics/airlift footprint, aircraft surveillance coverage area, and supportability. *FY 2011 Base Plans:* In FY 2011: NextGen: Continue GBSAA analysis and complete multilateration demonstration. *FY 2011 OCO Plans:* IN FY 2011 OCO: N/A	0.000	2.180	4.874	0.000	4.874
MAJOR THRUST: Preparation of acquisition documentation and conduct of associated contract award tasks leading to FY11 contract award for new Deployable Radar Approach Control (D-RAPCON).	0.354	3.002	16.053	0.000	16.053

Exhibit R-2A, RDT&E Project Justification: PB 2011 Air Force		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305114F: *Air Traffic Control/Approach/ Landing System (ATCALS)*	PROJECT 673587: *Air Traffic Control Systems*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2009 Accomplishments: In FY 2009: Conducted market research with several potential vendors and coordinated with user community on first draft of the Capability Development Document (CDD) in order to define Key Performance Parameters (KPPs). Also, began the development of key Milestone B documents. *FY 2010 Plans:* In FY 2010: Continue market research and finalize industry Technology Readiness Assessment. Conduct High Performance Team (HPT) to finalize and gain approval of CDD. Continue Milestone (MS) B documentation preparation and complete the Request for Proposal (RFP) package to include conducting the appropriate Multi-Independent Review Teams (MIRTs). *FY 2011 Base Plans:* In FY 2011: Conduct Source Selection, brief Source Selection Authority and select winning bidder. Prior to contract award, successfully conduct a Milestone B decision with the Milestone Decision Authority (MDA) and finally award the D-RAPCON contract. *FY 2011 OCO Plans:* In FY 2011 OCO: N/A					
MAJOR THRUST: Preparation of acquisition documentation and conduct of associated contract award tasks leading to FY10 contract award for new Deployable Instrument Landing System (D-ILS). *FY 2009 Accomplishments:* In FY 2009: Conducted market research with several potential vendors and gained an AFROC-approved Capability Development Document (CDD) that defines Key Performance Parameters (KPPs). Also, began the development of key Milestone B and RFP documentation.	4.092	3.731	12.341	0.000	12.341

Exhibit R-2A, RDT&E Project Justification: PB 2011 Air Force		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305114F: *Air Traffic Control/Approach/ Landing System (ATCALS)*	PROJECT 673587: *Air Traffic Control Systems*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: In FY 2010: Finalize industry Technology Readiness Assessment. Complete the Request for Proposal (RFP) package to include conducting the appropriate Multi-Independent Review Teams (MIRTs). Conduct Source Selection, brief Source Selection Authority and select winning bidder. Prior to contract award, successfully conduct a Milestone B decision with the Milestone Decision Authority (MDA) and finally award the D-ILS contract. *FY 2011 Base Plans:* In FY 2011: Conduct Engineering Manufacturing Development (EMD) phase to include a successful the Initial Baseline Review, System Functin Review, Preliminary Design Review, and Critical Design Review. *FY 2011 OCO Plans:* In FY 2011 OCO: N/A					
MAJOR THRUST: NATO Cooperative Airspace Initiative (CAI). The objective of this initiative is to develop and test cooperative airspace procedures for use during a renegade event. *FY 2009 Accomplishments:* In FY 2009: Conducted testing (simulations) to demonstrate the ability to provide early detection and notifiction of situations in which aircraft are suspected of being used as weapons to perpetrate terrorist attacks between and / or among NATO and Russian countries. In FY 10 complete testing (flight exercises) and validation of CAI procedures to demonstrate the timely, accurate and continuous exchange of air traffic information across national borders when tracking aircraft suspected of being used in terrorist attacks. *FY 2010 Plans:* In FY 2010: N/A	0.350	0.000	0.000	0.000	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2011 Air Force		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305114F: *Air Traffic Control/Approach/ Landing System (ATCALS)*	PROJECT 673587: *Air Traffic Control Systems*

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2011 Base Plans: In FY 2011: N/A *FY 2011 OCO Plans:* In FY 2011 OCO: N/A					
Accomplishments/Planned Programs Subtotals	4.796	8.913	33.268	0.000	33.268

	FY 2009	FY 2010
Congressional Add: Continues development and testing of the Tactical Transponser Landing System (TTLS). *FY 2009 Accomplishments:* In FY 2009: Conducted concept and technology assessment of current TTLS capabilities and how it could be used under military conditions. Effort focused on increasing system capacity to include guidance for up to four aircraft in terminal area at the same time. The current system is limited to two aircraft. *FY 2010 Plans:* In FY 2010: Continue FY09 effort.	4.000	2.400
Congressional Adds Subtotals	4.000	2.400

Exhibit R-2A, RDT&E Project Justification: PB 2011 Air Force		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305114F: *Air Traffic Control/Approach/ Landing System (ATCALS)*	PROJECT 673587: *Air Traffic Control Systems*

C. Other Program Funding Summary ($ in Millions)

Line Item	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	FY 2012	FY 2013	FY 2014	FY 2015	Cost To Complete	Total Cost
• PE 0305114F: *Air Traffic Control and Landing Systems (OPAF)*	9.620	22.521	6.543	3.900	10.443	35.421	83.190	96.287	82.473	0.000	0.000

D. Acquisition Strategy

Award multiple, competitive contract vehicles emphasizing off-the-shelf technology and maximizing the use of non-developmental items (NDIs).

E. Performance Metrics

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Air Force			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0305114F: *Air Traffic Control/Approach/ Landing System (ATCALS)*	PROJECT 673587: *Air Traffic Control Systems*	

	Total Prior Years Cost	FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	0.000		0.000		0.000		0.000			

Remarks

Total Prior Years Cost may include only FY 2009 data.

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Air Force		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*	**R-1 ITEM NOMENCLATURE** PE 0305114F: *Air Traffic Control/Approach/ Landing System (ATCALS)*	**PROJECT** 673587: *Air Traffic Control Systems*

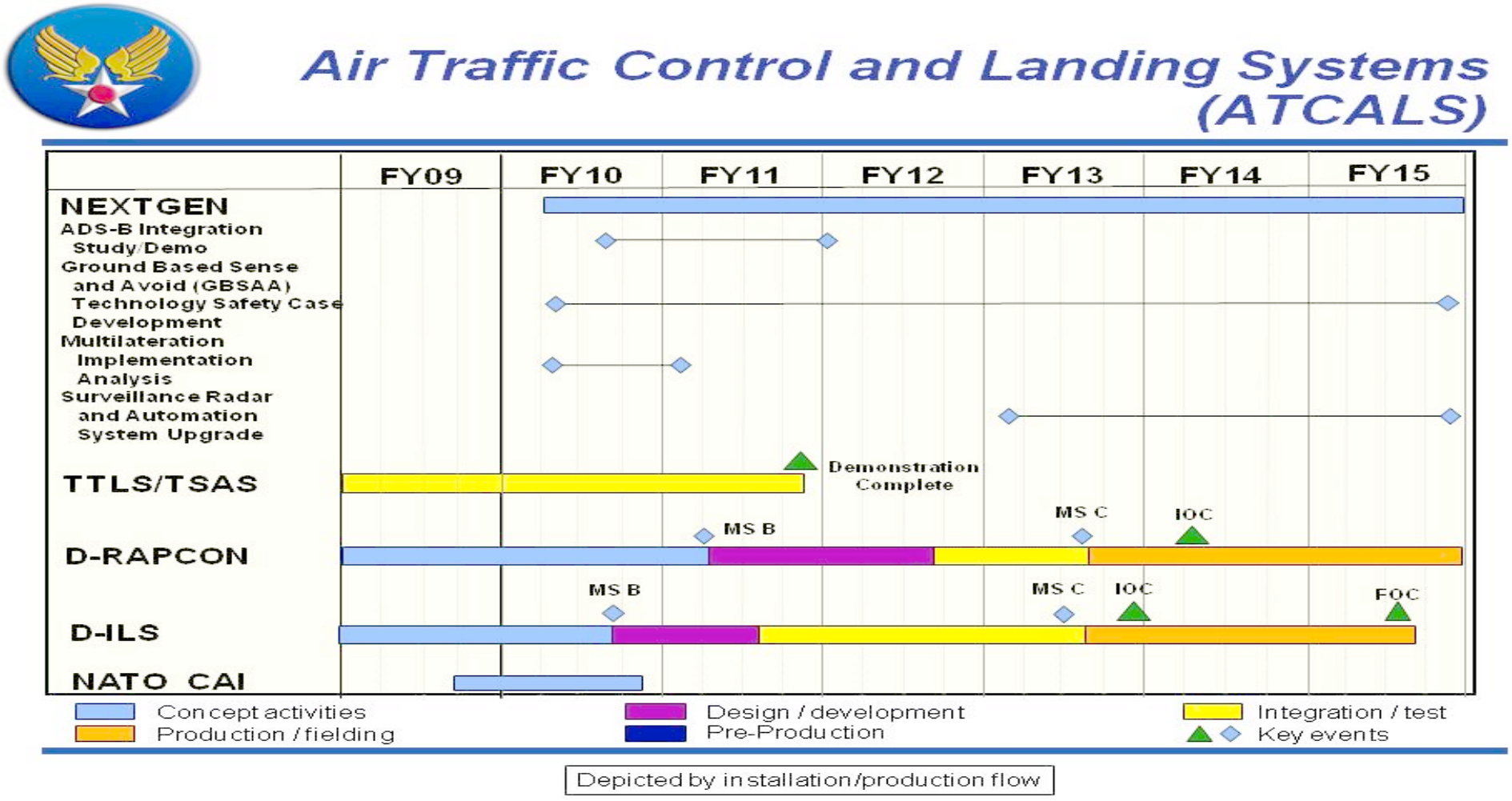

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Air Force		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*	**R-1 ITEM NOMENCLATURE** PE 0305114F: *Air Traffic Control/Approach/ Landing System (ATCALS)*	**PROJECT** 673587: *Air Traffic Control Systems*

Schedule Details

	Start		End	
Event	**Quarter**	**Year**	**Quarter**	**Year**
Next Generation Air Transportation System (NextGen)	3	2010	4	2011
ADS-B Integration Study/Demo	3	2010	4	2011
Ground Based Sense and Avoid Technology	2	2010	4	2011
Multilateration Implementation Analysis	2	2010	1	2011
TTLS/TSAS	1	2009	4	2011
D-RAPCON	1	2009	4	2011
D-ILS	1	2009	4	2011
NATO CAI	3	2009	4	2010