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 0401219F: *KC-10S*							
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	3.800	35.586	56.669	0.000	56.669	13.791	0.000	0.000	0.000	Continuing	Continuing
675195: *Aircraft Modernization Program (AMP)*	3.800	35.586	56.669	0.000	56.669	13.791	0.000	0.000	0.000	0.000	125.339

A. Mission Description and Budget Item Justification

The KC-10A Extender is an aerial refueling asset built on the commercial DC-10 airframe. The aircraft creates an air bridge to enable rapid global mobility and global strike missions. There are 59 aircraft in the USAF tanker fleet.

RDT&E funds throughout the FYDP will be used to support the Communications, Navigation and Surveillance/Air Traffic Management (CNS/ATM) and Boom Control Unit (BCU) modification efforts.

The KC-10 Aircraft Modernization Program (AMP) was the first major modification to the KC-10A Extender and included required CNS upgrades, increased survivability, net-centric operational capabilities, reliability enhancements, Night Vision Imaging System (NVIS), a growth path for Defensive Systems (DS), provisions to support multi-mission payloads, real-time threat information in the cockpit (RTIC), communications upgraded flight data recorder (FDR), fuel system gauges, refueling boom/drogue electronics, and flight engineer station controls/instruments.

In mid-FY07, concept refinement studies addressed potential technical approaches, spiral developments, cockpit commonality and yielded valuable affordability information. Shortly thereafter, HQ AMC decided to reduce program scope based on affordability. As a result, the current effort will consist of three AMP requirements: Communications Navigation Surveillance/Air Traffic Management (CNS/ATM), Boom Control Unit (BCU) and Mode 5. As of Mar 08, OC-ALC assumed management responsibility for the program.

The KC-10 CNS/ATM program will provide worldwide airspace accessibility by FY2015 for the fleet of 59 aircraft. An upgrade of the current Flight Management System (FMS) and Inertial Navigation System (INS) will be required to meet the 2015 CNS/ATM requirements. Avionics components shall use either commercial off-the-shelf (COTS), or military off-the-shelf (MOTS) software and hardware. CNS/ATM requirements include: Required Navigation Performance (RNP-4) Oceanic/Remote for En-route Oceanic Airspace with either 50/50 NM or 30/30 NM separations; Basic Area Nav (BRNAV) for En route European Airspace (9,500ft & up); RNAV 2 & 1 for en route & Terminal airspace operations; Precision-RNAV (P-RNAV) for preferred terminal area routes in Europe (1 NM Accuracy); RNP-4 & RNP-1 for reduced separations en route, and terminal airspace; Time of Arrival Control for Refuel rendezvous (within 30 sec); Automatic Dependent Surveillance-Broadcast (ADS-B) Out for enhanced air and ground surveillance; Global Positioning System (GPS) for enhanced navigation capability; Selective Availability Anti-Spoofing Module (SAASM)

for Global Positioning System (GPS) Security; Satellite Data Link for ATS and C2 Communications for flight in Oceanic Airspace (FL310-410); Satellite Voice for Beyond Line of Sight (BLOS) Pilot - Controller Communications and C2 Operations; and VHF Data Link (VD)L Mode-2 for LOS Pilot - Controller Communications and C2 Operations. FAA airworthiness certification of the modification is required.

The KC-10 Boom Control Unit (BCU), responsible for the operation of the KC-10's primary air refueling mission, will soon be unsupportable due to parts obsolescence as early as 2010. Once the BCU spares pool is exhausted (estimated to be 2012 +/- 2 years), any KC-10 requiring a BCU repair or replacement will not be capable of performing its air refueling mission until a replacement unit is fielded. This modification effort replaces the current BCU to overcome these parts obsolescence issues. The replacement BCU will be form, fit, function, and interface identical to the existing unit so as to be fully interchangeable.

The Mode 5 modification is a DoD-mandated (IOC by 2014, FOC by 2020) upgrade to the KC-10's Identify Friend or Foe (IFF) system (the primary means of aircraft identification during Air Defense operations). The Mode 5 upgrade will increase anti-spoofing/exploitation capabilities, and lower the possibility of aircraft/aircrew loss due to misidentification of friendly aircraft. The modification will include a new Mode 5 crypto applique, new IFF control panel, a circuit card upgrade to the APX-119 transponder, support equipment upgrades and replacement of data loader from the avionics bay to the flight deck.

This program has associated APAF funding in Program Elements 41219F and 41897F.

These efforts support fielded weapons systems and therefore are assigned to Budget Activity 7, Operational Systems Development.

B. Program Change Summary ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	0.000	35.586	0.000	0.000	0.000
Current President's Budget	3.800	35.586	56.669	0.000	56.669
Total Adjustments	3.800	0.000	56.669	0.000	56.669
• Congressional General Reductions		0.000			
• 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	0.000	0.000			
• Other Adjustments	3.800	0.000	56.669	0.000	56.669

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 0401219F: *KC-10S*

Change Summary Explanation

FY2009 funding will be used to support Boom Control Unit Phase II RDT&E activities such as the Critical Design Review (CDR). FY2011 funding will be used to support continuation of the CNS/ATM Engineering Manufacturing Development (EMD) activities, including a Critical Design Review (CDR) and test and evaluation events.

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 0401219F: *KC-10S*	PROJECT 675195: *Aircraft Modernization Program (AMP)*	

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
675195: *Aircraft Modernization Program (AMP)*	3.800	35.586	56.669	0.000	56.669	13.791	0.000	0.000	0.000	0.000	125.339
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0		

A. Mission Description and Budget Item Justification

In mid-FY07, concept refinement studies addressed potential technical approaches, spiral developments, cockpit commonality and yielded valuable affordability information. Shortly thereafter, HQ AMC decided to reduce program scope based on affordability. As a result, the current effort will consist of three AMP requirements: Communications Navigation Surveillance/Air Traffic Management (CNS/ATM), Boom Control Unit (BCU) and Mode 5. As of Mar 08, OC-ALC assumed management responsibility for the program.

The KC-10 Communications, Navigation, and Surveillance/Air Traffic Management (CNS/ATM) program will provide worldwide airspace accessibility by FY2015 for the fleet of 59 aircraft. An upgrade of the current Flight Management System (FMS) and Inertial Navigation System (INS) will be required to meet the 2015 CNS/ATM requirements. Avionics components shall use either commercial off-the-shelf (COTS) or military off-the-shelf (MOTS) software and hardware. CNS/ATM requirements include: RNP-4 Oceanic/Remote for En-route Oceanic Airspace with either 50/50 NM or 30/30 NM separations; Basic Area Nav (BRNAV) for En route European Airspace (9,500ft & up); RNAV 2 & 1 for En route & Terminal airspace operations; Precision-RNAV (P-RNAV) for Preferred terminal area routes in Europe (1 NM Accuracy); RNP-4 & RNP-1 for Reduced separations en route, and terminal airspace; Time of Arrival Control for Refuel rendezvous (within 30 sec); ADS-B Out for Enhanced air and ground surveillance; Global Positioning System (GPS) for Enhanced Navigation Capability; SAASM for GPS Security; Satellite Data Link for ATS and C2 Communications for flight in Oceanic Airspace (FL310-410); Satellite Voice for BLOS Pilot - Controller Communications C2 Operations; and VDL Mode-2 for LOS Pilot - Controller Communications and C2 Operations. FAA airworthiness certification of the modification is required.

The KC-10 Boom Control Unit (BCU), responsible for the operation of the KC-10's primary air refueling mission, is unsupportable due to parts obsolescence. Once the BCU spares pool is exhausted, the KC-10 fleet will not be capable of performing its air refueling mission until a BCU replacement unit is fielded. This modification effort replaces the current BCU to overcome these parts obsolescence issues, to improve diagnostics, and add the capability to provide boom position information to an external recording device (planned future recording capability). The Advanced BCU (A-BCU) will also add the capability to accept inputs from the existing, or next generation Central Air Data Computer (CADC). The A-BCU will be form, fit, function, and interface identically to the existing unit so as to be fully interchangeable.

The Mode 5 modification is a DoD-mandated (IOC by 2014, FOC by 2020) upgrade to the KC-10's Identify Friend or Foe (IFF) system (the primary means of aircraft identification during Air Defense operations). The Mode 5 upgrade will increase anti-spoofing/exploitation capabilities, and lower the possibility of aircraft/aircrew loss

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 0401219F: *KC-10S*	PROJECT 675195: *Aircraft Modernization Program (AMP)*

due to misidentification of friendly aircraft. The modification will include a new Mode 5 crypto applique, new IFF control panel, a circuit card upgrade to the APX-119 transponder, support equipment upgrades and replacement of data loader from the avionics bay to the flight deck.

B. Accomplishments/Planned Program ($ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Major Thrust: CNS-ATM Avionics Upgrade, Boom Control Unit Development and Mode 5 Engineering Design	3.800	35.586	56.669	0.000	56.669
FY 2009 Accomplishments: In FY2009: CNS/ATM: Accomplished Request For Proposal (RFP) release to industry. Received proposals to begin source selection. Continue source selection. A-BCU: Engineering design and analysis effort to develop A-BCU engineering development units and flight test units.					
FY 2010 Plans: In FY2010: CNS/ATM: Milestone B (MS B) Document preparation is ongoing. At contract award, start Engineering, Manufacturing, Development (EMD). Conduct and approve Preliminary Design review. A-BCU: Integration and system testing of A-BCU; qualification and certification of A-BCU; tech order source data development; production/repair source qualification.					
FY 2011 Base Plans: In FY2011: CNS/ATM: Continue EMD. Conduct and approve Critical Design review (CDR). Test and evaluation start. Mode 5: Engineering design and analysis effort to develop new digital control panel and upgrade existing APX-100 to support Mode 5.					
FY 2011 OCO Plans: In FY2011 OCO: N/A					
Accomplishments/Planned Programs Subtotals	3.800	35.586	56.669	0.000	56.669

Exhibit R-2A, RDT&E Project Justification: PB 2011 Air Force		DATE: February 2010
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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 0401219F: *Boom Control Unit (BCU) Mod # 7727 Procurement*	0.000	0.000	2.163	0.000	2.163	1.854	0.000	0.000	0.000	0.000	0.000
• PE 0401219F (1): *Mode 5 Mod # 7728 Procurement*	0.000	0.000	2.081	0.000	2.081	2.524	7.865	0.622	0.000	0.000	0.000
• PE 0401219F (2): *CNS/ATM Mod # 7726 Procurement*	0.000	0.000	0.000	0.000	0.000	35.670	72.289	72.385	35.518	0.000	0.000

D. Acquisition Strategy

Acquisition Approach Summary. The acquisition will be in accordance with Federal Acquisition Regulation (FAR) Part 15, Contracting by Negotiation. This acquisition will seek to award to a single integrator to accomplish design/development, test and evaluation, production, and installation and utilize Performance Price Tradeoff (PPT) source selection procedures. Sufficient competition is expected since there are several contractors with experience in CNS/ATM integration on military and commercial aircraft.

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 0401219F: *KC-10S*	PROJECT 675195: *Aircraft Modernization Program (AMP)*

Product Development ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Studies and Analysis	Various	Boeing Corp Oklahoma City, OK	1.496	0.000		0.000		0.000		0.000	0.000	1.496	0.000
Development Engineering, Design, and Integration (BCU Phase I)	Various	Boeing Corp Oklahoma City, OK, Long Beach, CA	10.354	0.000		0.000		0.000		0.000	0.000	10.354	0.000
Development Engineering, Design, and Integration (BCU Phase II)	Various	Boeing Corp Oklahoma City, OK, Long Beach, CA	2.010	0.000		0.000		0.000		0.000	0.000	2.010	0.000
Development Engineering, Design, and Integration (BCU Phase III)	Various	TBD TBD	0.000	2.010	Aug 2010	0.000		0.000		0.000	0.000	2.010	0.000
Development Engineering, Design, and Integration (CNS/ ATM)	Various	TBD TBD	0.000	28.823	May 2010	54.068	May 2011	0.000		54.068	10.029	92.920	0.000
Development Engineering, Design, and Integration (Mode 5)	Various	TBD TBD	0.000	0.000		1.645	Jan 2011	0.000		1.645	0.000	1.645	0.000
		Subtotal	13.860	30.833		55.713		0.000		55.713	10.029	110.435	0.000

Remarks

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Air Force		DATE: February 2010
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Test and Evaluation ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Gov Test and Evaluation (BCU)	TBD/TBD	TBD TBD	0.000	3.000	Aug 2010	0.000		0.000		0.000	0.000	3.000	0.000
Gov Test and Evaluation (CNS/ATM)	TBD/TBD	TBD TBD	0.000	0.000		0.000		0.000		0.000	3.762	3.762	0.000
		Subtotal	0.000	3.000		0.000		0.000		0.000	3.762	6.762	0.000

Remarks

Management Services ($ in Millions)

				FY 2010		FY 2011 Base		FY 2011 OCO		FY 2011 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Total Prior Years Cost	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
Mission Support	Various	TBD Tinker AFB, OK	4.850	1.753		0.956	Jun 2011	0.000		0.956	0.000	7.559	0.000
		Subtotal	4.850	1.753		0.956		0.000		0.956	0.000	7.559	0.000

Remarks

	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	18.710	35.586		56.669		0.000		56.669	13.791	124.756	0.000

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 0401219F: *KC-10S*	PROJECT 675195: *Aircraft Modernization Program (AMP)*	

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

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 0401219F: *KC-10S*	PROJECT 675195: *Aircraft Modernization Program (AMP)*

FOUO

KC-10 CNS/ATM Schedule

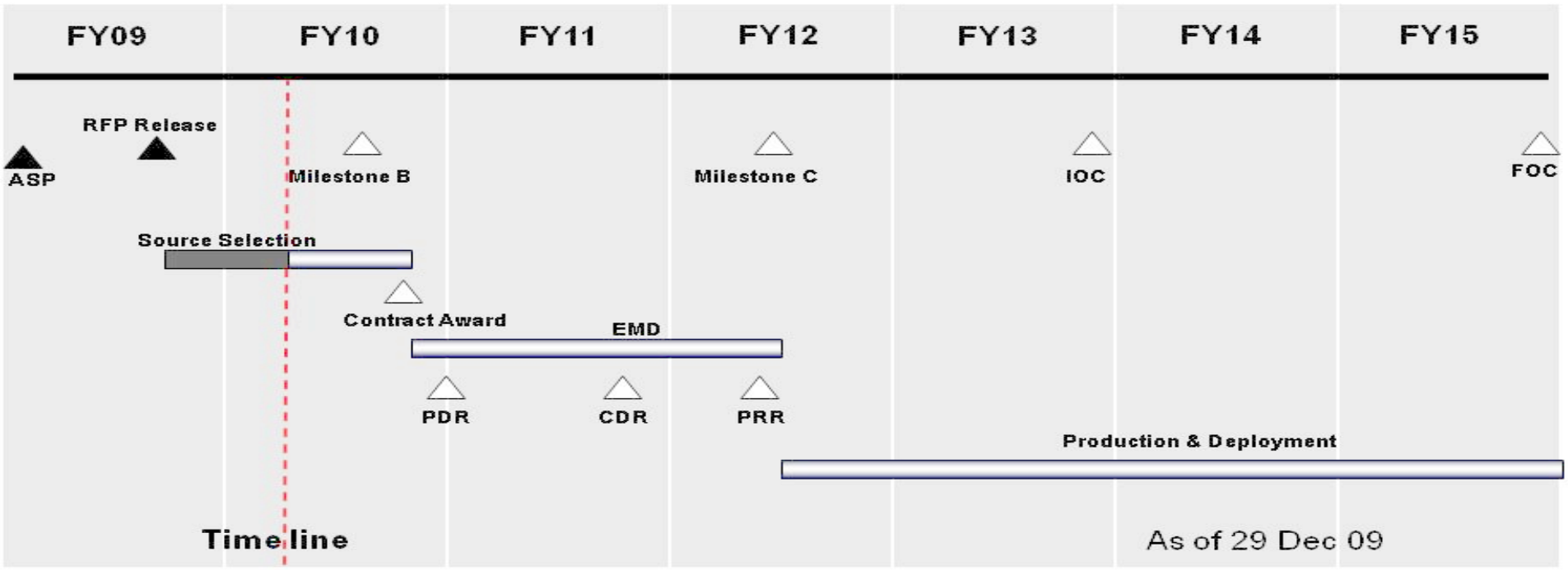

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Air Force		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0401219F: *KC-10S*	PROJECT 675195: *Aircraft Modernization Program (AMP)*

FOUO

KC-10 A-BCU Schedule

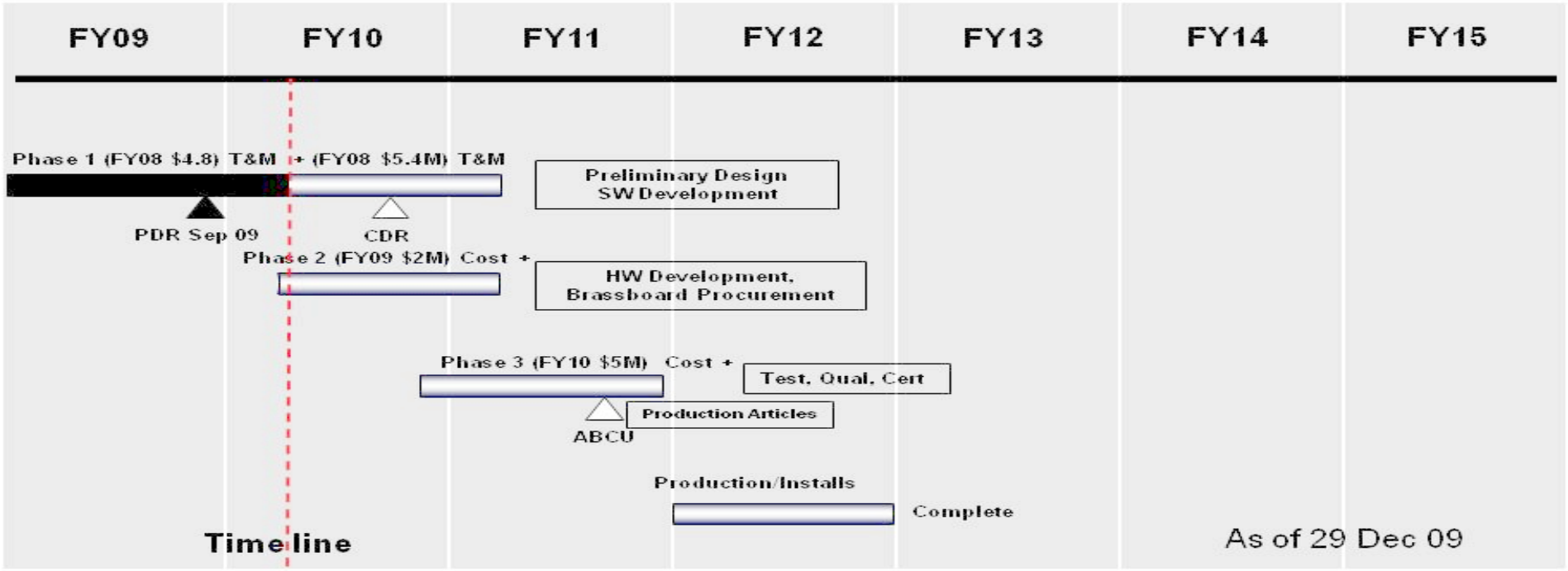

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Air Force		DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY 3600: *Research, Development, Test & Evaluation, Air Force* BA 7: *Operational Systems Development*	R-1 ITEM NOMENCLATURE PE 0401219F: *KC-10S*	PROJECT 675195: *Aircraft Modernization Program (AMP)*

Schedule Details

	Start		End	
Event	Quarter	Year	Quarter	Year
Capabilities Development Document (CDD) AFROCC Approved	1	2009	1	2009
CNS/ATM Engineering Manufacturing Development (EMD) RFP Release	3	2009	3	2009
Source Selection CNS/ATM	4	2009	4	2009
Source Selection CNS/ATM (1)	1	2010	3	2010
CNS/ATM EMD Contract Award/Milestone B	1	2010	4	2010
CNS/ATM EMD	1	2011	4	2011
BCU Preliminary Design Review	4	2009	4	2009
BCU Phase II Contract Award	1	2010	1	2010
BCU Critical Design Review	3	2010	3	2010
BCU Phase III Contract Award	4	2010	4	2010
Two BCU Prototypes Complete	3	2011	3	2011