| Exhibit R-2, RDT&E Budget Item Justification: PB 2013 Air Force | | | | | | | | | | DATE: February 2012 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>3600: *Research, Development, Test & Evaluation, Air Force*<br>BA 7: *Operational Systems Development* | | | | R-1 ITEM NOMENCLATURE<br>PE 0401219F: *KC-10S* | | | | | | | |
| **COST ($ in Millions)** | **FY 2011** | **FY 2012** | **FY 2013 Base** | **FY 2013 OCO** | **FY 2013 Total** | **FY 2014** | **FY 2015** | **FY 2016** | **FY 2017** | **Cost To Complete** | **Total Cost** |
| Total Program Element | 41.456 | 30.868 | 24.022 | - | 24.022 | 4.580 | 3.054 | - | - | Continuing | Continuing |
| 674498: *KC-10 Drag* | - | - | 1.900 | - | 1.900 | - | - | - | - | Continuing | Continuing |
| 675195: *Aircraft Modernization Program (AMP)* | 41.456 | 30.868 | 22.122 | - | 22.122 | 4.580 | 3.054 | - | - | Continuing | Continuing |

**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 KC-10 aircraft in the USAF tanker fleet. Funds through FY17 will be used to support the Communications, Navigation and Surveillance/ Air Traffic Management (CNS/ATM), KC-10 Drag Reduction and Mode 5 modification efforts.

In FY13, Project Number 675195, KC-10 Aircraft Modernization Program (Procurement) funding transferred to Project Number 67195, KC-10 Aircraft Modernization Program (RDT&E), in order to finish design, integration, and testing efforts.

In FY13, Project Number 674498, KC-10 Drag Reduction is a New Start effort.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

| **B. Program Change Summary ($ in Millions)** | **FY 2011** | **FY 2012** | **FY 2013 Base** | **FY 2013 OCO** | **FY 2013 Total** |
|---|---|---|---|---|---|
| Previous President's Budget | 56.669 | 30.868 | - | - | - |
| Current President's Budget | 41.456 | 30.868 | 24.022 | - | 24.022 |
| Total Adjustments | -15.213 | - | 24.022 | - | 24.022 |
| • Congressional General Reductions | - | - | | | |
| • Congressional Directed Reductions | - | - | | | |
| • Congressional Rescissions | - | - | | | |
| • Congressional Adds | - | - | | | |
| • Congressional Directed Transfers | - | - | | | |
| • Reprogrammings | - | - | | | |
| • SBIR/STTR Transfer | - | - | | | |
| • Other Adjustments | -15.213 | - | 24.022 | - | 24.022 |

**Change Summary Explanation**

FY11: Congressional General Reduction of 0.213M in Adjustment Row

| Exhibit R-2, RDT&E Budget Item Justification: PB 2013 Air Force | DATE: February 2012 |
|---|---|
| **APPROPRIATION/BUDGET ACTIVITY**<br>3600: *Research, Development, Test & Evaluation, Air Force*<br>BA 7: *Operational Systems Development* | **R-1 ITEM NOMENCLATURE**<br>PE 0401219F: *KC-10S* |

FY11: $15M reduction due to Milestone B schedule slip in Adjustment Row

FY13: Funding increase of $24.022M due to internal Air Force transfers to complete development activities for KC-10 Drag and CNS/ATM

| Exhibit R-2A, RDT&E Project Justification: PB 2013 Air Force | | | DATE: February 2012 |
|---|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>3600: *Research, Development, Test & Evaluation, Air Force*<br>BA 7: *Operational Systems Development* | R-1 ITEM NOMENCLATURE<br>PE 0401219F: *KC-10S* | PROJECT<br>674498: *KC-10 Drag* | |

| COST ($ in Millions) | FY 2011 | FY 2012 | FY 2013 Base | FY 2013 OCO | FY 2013 Total | FY 2014 | FY 2015 | FY 2016 | FY 2017 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 674498: *KC-10 Drag* | - | - | 1.900 | - | 1.900 | - | - | - | - | Continuing | Continuing |
| Quantity of RDT&E Articles | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |

**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 enabling rapid global mobility and global strike missions. There are 59 KC-10A aircraft in the USAF tanker fleet.

The KC-10 Drag Reduction program will improve fuel efficiency by adapting aerodynamic improvements to three areas of separated airflow identified on the airframe that produce turbulence. The three areas are the Pylon Fillet, Windshield Fairings, and Outboard Slat Seals. The total improvement in fuel burn is 1.4% fuel savings. This drag improvement results in reduced fuel consumption of 1,710,000 gallons per year after the modification is completed.

This is an FY13 New Start.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2011 | FY 2012 | FY 2013 |
|---|---|---|---|
| ***Title:*** KC-10 Drag Reduction program | - | - | 1.900 |
| ***Description:*** KC-10 Drag Reduction engineering design and analyis.<br><br>***FY 2013 Plans:***<br>Engineering design and analysis effort to modify the three areas of separated airflow identified on the airframe which produce turbulence. | | | |
| **Accomplishments/Planned Programs Subtotals** | - | - | 1.900 |

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

| Line Item | FY 2011 | FY 2012 | FY 2013 Base | FY 2013 OCO | FY 2013 Total | FY 2014 | FY 2015 | FY 2016 | FY 2017 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • PE0401219F, APAF: *Drag Reduction Modification* | 0.000 | 0.000 | 0.175 | 0.000 | 0.175 | 10.100 | 12.800 | 3.100 | 0.000 | Continuing | Continuing |

**D. Acquisition Strategy**

Approach will be a 15 month RDT&E effort in FY13, followed by procurement and install for fleet.

| Exhibit R-2A, RDT&E Project Justification: PB 2013 Air Force | | DATE: February 2012 |
|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>3600: *Research, Development, Test & Evaluation, Air Force*<br>BA 7: *Operational Systems Development* | R-1 ITEM NOMENCLATURE<br>PE 0401219F: *KC-10S* | PROJECT<br>674498: *KC-10 Drag* |

**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-4, RDT&E Schedule Profile: PB 2013 Air Force | | DATE: February 2012 |
|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>3600: *Research, Development, Test & Evaluation, Air Force*<br>BA 7: *Operational Systems Development* | R-1 ITEM NOMENCLATURE<br>PE 0401219F: *KC-10S* | PROJECT<br>674498: *KC-10 Drag* |

| Exhibit R-4A, RDT&E Schedule Details: PB 2013 Air Force | | DATE: February 2012 |
|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>3600: *Research, Development, Test & Evaluation, Air Force*<br>BA 7: *Operational Systems Development* | R-1 ITEM NOMENCLATURE<br>PE 0401219F: *KC-10S* | PROJECT<br>674498: *KC-10 Drag* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| Contract Award | 2 | 2013 | 2 | 2013 |
| Develop Drag Reduction modification, source data certification and testing | 2 | 2013 | 2 | 2014 |
| Modifcation Kit Production | 2 | 2014 | 3 | 2015 |
| Modification Kit Installation | 4 | 2014 | 2 | 2016 |

| Exhibit R-2A, RDT&E Project Justification: PB 2013 Air Force | | | DATE: February 2012 |
|---|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>3600: *Research, Development, Test & Evaluation, Air Force*<br>BA 7: *Operational Systems Development* | R-1 ITEM NOMENCLATURE<br>PE 0401219F: *KC-10S* | PROJECT<br>675195: *Aircraft Modernization Program (AMP)* | |

| COST ($ in Millions) | FY 2011 | FY 2012 | FY 2013 Base | FY 2013 OCO | FY 2013 Total | FY 2014 | FY 2015 | FY 2016 | FY 2017 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 675195: *Aircraft Modernization Program (AMP)* | 41.456 | 30.868 | 22.122 | - | 22.122 | 4.580 | 3.054 | - | - | Continuing | Continuing |
| Quantity of RDT&E Articles | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |

**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 enabling rapid global mobility and global strike missions. There are 59 KC-10A 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 Mode 5 modification efforts.

The KC-10 Communications, Navigation, and Surveillance/Air Traffic Management (CNS/ATM) program provides worldwide airspace accessibility by FY2015 for the fleet of 59 KC-10 aircraft. FAA airworthiness certification following the modification is required. An upgrade of the current Flight Management System (FMS) and Inertial Navigation System (INS) is required to meet the 2015 CNS/ATM requirements and address associated INS and FMS obsolescence issues. This capability gap is well documented in both RAND KC-10 Analysis of Alternatives (AoA) and Service Life Extension Program (SLEP) studies. 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 enroute Oceanic Airspace with either 50/50 Nautical Miles (NM) or 30/30 NM separations; Basic Area Navigation (BRNAV) for enroute European Airspace (9,500ft & up); RNP 2 & 1 for enroute & terminal airspace operations; Precision-RNAV (P-RNAV) for Preferred terminal area routes in Europe (1 NM Accuracy); RNP-4 & RNP-1 for reduced separations enroute, 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 Air Traffic Systems (ATS) and Command and Control (C2) Communications for flight in Oceanic Airspace (FL310-410); Satellite Voice for Beyond Line of Sight (BLOS) Pilot - Controller Communications C2 Operations; and Very-High Frequency Data Link (VDL) Mode-2 for Line of Sight (LOS) Pilot - Controller Communications and C2 Operations.

The Mode 5 modification is a DoD-mandated (JROCOM 047-07, 5 Mar 07 directs KC-10 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 increases anti-spoofing and exploitation capabilities, and lowers the possibility of aircraft/aircrew loss due to misidentification of friendly aircraft. The modification includes a new Mode 5 crypto applique, new IFF control panel, a circuit card upgrade to the APX-119 transponder, support equipment upgrades and replacement/relocation of the data loader from the avionics bay to the flight deck.

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2011 | FY 2012 | FY 2013 |
|---|---|---|---|
| ***Title:*** CNS-ATM Avionics Upgrade, and Mode 5 Engineering Design | 41.456 | 30.868 | 22.122 |
| ***Description:*** CNS-ATM Avionics Upgrade and Mode 5 Engineering Design to fleet of 59 KC-10 aircraft | | | |
| ***FY 2011 Accomplishments:*** | | | |

| Exhibit R-2A, RDT&E Project Justification: PB 2013 Air Force | | DATE: February 2012 |
|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>3600: *Research, Development, Test & Evaluation, Air Force*<br>BA 7: *Operational Systems Development* | R-1 ITEM NOMENCLATURE<br>PE 0401219F: *KC-10S* | PROJECT<br>675195: *Aircraft Modernization Program (AMP)* |

| B. Accomplishments/Planned Programs ($ in Millions) | FY 2011 | FY 2012 | FY 2013 |
|---|---|---|---|
| CNS/ATM: Begin preliminary design/development activities.<br>***FY 2012 Plans:***<br>CNS/ATM: Continue design, integration, and test activities.<br>***FY 2013 Plans:***<br>CNS/ATM: Finish development activities<br>Mode 5: Engineering design and analysis effort to develop new digital control panel and upgrade existing APX-100. | | | |
| **Accomplishments/Planned Programs Subtotals** | 41.456 | 30.868 | 22.122 |

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

| Line Item | FY 2011 | FY 2012 | FY 2013 Base | FY 2013 OCO | FY 2013 Total | FY 2014 | FY 2015 | FY 2016 | FY 2017 | Cost To Complete | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|
| • PE 0401219F, APAF, Mode 5: *Mode 5* | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 4.568 | 4.275 | 1.318 | 0.553 | Continuing | Continuing |
| • PE 0401219F, APAF, CNS/ATM: *CNS/ATM* | 0.000 | 0.000 | 38.921 | 0.000 | 38.921 | 64.600 | 15.200 | 0.000 | 0.000 | Continuing | Continuing |

**D. Acquisition Strategy**

Acquisition Approach Summary:
CNS/ATM: The acquisition is in accordance with Federal Acquisition Regulation (FAR) Part 15, Contracting by Negotiation. This acquisition was awarded to a single integrator to accomplish design/development, test and evaluation, production, and installation and utilized Performance Price Tradeoff (PPT) source selection procedures.

Mode 5: Approach will be a 1-year RDT&E effort in FY13, followed by procurement and install for fleet.

**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-4, RDT&E Schedule Profile: PB 2013 Air Force | | DATE: February 2012 |
|---|---|---|
| **APPROPRIATION/BUDGET ACTIVITY**<br>3600: *Research, Development, Test & Evaluation, Air Force*<br>BA 7: *Operational Systems Development* | **R-1 ITEM NOMENCLATURE**<br>PE 0401219F: *KC-10S* | **PROJECT**<br>675195: *Aircraft Modernization Program (AMP)* |

| Exhibit R-4A, RDT&E Schedule Details: PB 2013 Air Force | | DATE: February 2012 |
|---|---|---|
| APPROPRIATION/BUDGET ACTIVITY<br>3600: *Research, Development, Test & Evaluation, Air Force*<br>BA 7: *Operational Systems Development* | R-1 ITEM NOMENCLATURE<br>PE 0401219F: *KC-10S* | PROJECT<br>675195: *Aircraft Modernization Program (AMP)* |

## Schedule Details

| | Start | | End | |
|---|---|---|---|---|
| **Events** | **Quarter** | **Year** | **Quarter** | **Year** |
| CNS/ATM EMD Contract Award | 3 | 2011 | 3 | 2011 |
| CNS/ATM Development | 3 | 2011 | 2 | 2013 |
| CNS/ATM Preliminary Design Review | 1 | 2012 | 1 | 2012 |
| CNS/ATM Critical Design Review | 3 | 2012 | 3 | 2012 |
| CNS/ATM Developmental Testing | 2 | 2013 | 2 | 2014 |
| CNS/ATM Operational Testing | 2 | 2013 | 3 | 2013 |
| CNS/ATM Mod Kit Production | 2 | 2013 | 1 | 2015 |
| CNS/ATM Mod Kit Installation | 2 | 2014 | 4 | 2015 |
| Mode 5 EMD Contract Award | 2 | 2013 | 2 | 2013 |
| Mode 5 Development/Testing | 2 | 2013 | 2 | 2014 |
| Mode 5 Mod Kit Production | 2 | 2014 | 2 | 2015 |
| Mode 5 Mod Kit Installation | 3 | 2014 | 4 | 2015 |