PE NUMBER: 0207417F
PE TITLE: Airborne Warning and Control System (AWACS)

Exhibit R-2, RDT&E Budget Item Justification	DATE February 2005
BUDGET ACTIVITY 07 Operational System Development	PE NUMBER AND TITLE 0207417F Airborne Warning and Control System (AWACS)

	Cost ($ in Millions)	FY 2004 Actual	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total
	Total Program Element (PE) Cost	250.114	285.737	121.565	94.498	96.692	91.089	129.596	145.997	Continuing	TBD
411L	Airborne Warning & Control System (AWACS)	250.114	285.737	121.565	94.498	96.692	91.089	129.596	145.997	Continuing	TBD

(U) A. Mission Description and Budget Item Justification

A. Mission Description

The funding set forth in this document investigates, develops, and integrates system improvements to enable the E-3 AWACS to remain an effective Battle Management airborne surveillance system for command and control of combat forces and for strategic defense of the U.S. This PE funds the following efforts:
Modernization Programs: (RDT&E, AF)

1) The Integrated DAMA (Demand Assigned Multiple Access) / GATM (Global Air Traffic Management) Program seeks to make communications and navigation improvements required to meet current mandated DAMA SATCOM (Satellite Communication) and Air Traffic Control (ATC) requirements.

A) DAMA SATCOM is a Chairman Joint Chiefs of Staff (CJCS)--mandated Ultra-High Frequency (UHF) satellite communications upgrade consisting of two new UHF DAMA terminals and new Radio Frequency (RF) components, to mitigate co-site interference, replacing the two non-DAMA UHF SATCOM radios on each aircraft. The DAMA enhancements will expand user availability of severely limited DoD UHF SATCOM channels, improving the interoperability and efficiency of DoD UHF SATCOM systems.

B) GATM is an FAA/International Civil Aviation Organization (ICAO)/EUROCONTROL--mandated ATC upgrade consisting of new Very High Frequency (VHF) radios with 8.33 kHz channel spacing, Traffic-alert Collision Avoidance System (TCAS)/Mode-S Identification Friend or Foe (IFF) and Reduced Vertical Separation Minimum (RVSM) capability. The ATC enhancements will permit more aircraft to fly closer together in congested airspace worldwide, particularly in European airspace. Non-compliance already results in airspace restrictions and denials, impacting AWACS' ability to support worldwide response in situations requiring immediate on-scene command and control (C2) battle management.

2) Block 40/45 is replacing AWACS 1970's vintage mission systems that are experiencing Diminishing Manufacturing Sources (DMS) issues, are difficult and expensive to upgrade, and limit overall AWACS system performance. The Block 40/45 upgrade will improve quality and timeliness of sensor data to the shooter, improve Combat Identification (CID), provide sensor fusion capability in support of the Single Integrated Air Picture (SIAP) via multi-sensor integration (MSI), improve AWACS contribution to Time Critical Targeting via Data Link Infrastructure, resolve radar electronics DMS, and enable more effective, faster upgrades via an open systems architecture.

3) Command & Control, Intelligence, Surveillance and Reconnaissance (C2ISR): C2ISR System Architecture Improvements provide timely enhancements to improve critical areas of the AWACS mission system, primarily in three areas:

A) Mission Capable (MC) rate improvement: Reliability, Maintainability & Availability (RM&A) analysis and development projects provide system improvements that boost the below-standard MC rate of this critical C2 platform and increase airframe longevity in order to support its flight commitment to end of operational life. Such efforts focus on increasing reliability of the air vehicle, command, control, computer, sensor systems and infrastructure improvements as well as providing solutions to diminishing manufacturing sources. Efforts will also focus on insertion of new technologies with the aim of reducing maintenance man-hours along with periodic depot maintenance improvements to increase aircraft availability. Programs will focus on risk reduction, development, and fielding.

B) C2ISR enhancement and integration: AWACS seeks to fulfill the requirements of Joint Vision 2020 as well as Air Expeditionary Force (AEF) and other Task

Exhibit R-2, RDT&E Budget Item Justification	DATE February 2005
BUDGET ACTIVITY 07 Operational System Development	PE NUMBER AND TITLE 0207417F Airborne Warning and Control System (AWACS)

Force Concept of Operations to meet the needs of the operator. AWACS seeks to enhance network-centric warfare capabilities with other C2ISR systems by horizontally integrating machine-to-machine interfaces into AWACS in order to digitize the kill chain. Sensor and communications improvements, such as IFF interrogator/transponder and the ability to send, receive and fuse the air (and ground) picture via data link to fighter aircraft, will be developed through rapid prototyping, modeling, simulation and participation in live and simulated Joint exercises (e.g., Joint Combat Identification Evaluation Team (JCIET) and Joint Distributed Engineering Plant (JDEP)). Collaborative efforts with other sensor platforms through capabilities such as network-centric operations will also enhance horizontal integration efforts. Certain near-term efforts, required by the operator to improve the timeliness and accuracy of information passed to/from fighter aircraft in the engagement zone and to provide consistent and re-playable mission data once the mission is complete, are quick reaction capabilities that can be developed & fielded to support the next air war. The program includes concept exploration, technology development and demonstration efforts that support continuous improvements to C2ISR capabilities of manned & unmanned platforms, space, data links and advanced Battle Management decision tools. C2ISR continues to support and develop self-protection capabilities to enable current and future threat deterrence. Fielding strategies will provide for immediate field retrofit when able, otherwise fielding will occur in subsequent modernization programs. All programs are designed to integrate with & transition into the next C2ISR Platform. The AWACS program will coordinate with and participate in projects developing international standards (including NATO standards) to ensure joint, allied, and coalition interoperability. The E-3 will serve as the lead platform to support the development of the Mark XXIIA Mode 5 IFF capability carried out in PE 63742F, Combat ID Technology.

4) The Training, Support, and Infrastructure programs cover an array of cross cutting programs and activities in support of AWACS modification and enhancement programs. These programs include managing the AWACS developmental infrastructure, support equipment development, modernization planning/analysis, and trainer/simulator integration and concurrency. The Radar Systems Integration Lab/Software Development Facility must be maintained, operated and supported by contract to provide customers with a functioning APY 1/2 radar configuration in support of AWACS radar development, production and sustainment support equipment technologies and test strategies to ensure concurrent capability to sustain current, modified and upgraded E-3 equipment. Trainer/simulator concurrency analysis and definition is required to ensure trainers and simulators are kept current with the AWACS baseline. Associate contractor agreements are used to establish concurrency between prime integrators and training service providers.

5) Test System 3/Integration Labs: The E-3 AWACS testbed aircraft, Test System 3 (TS-3, tail number 73-1674) and the Avionics Integration Laboratory (AIL) are Government owned/contractor managed, maintained and operated assets. These test-ready assets support AWACS modernization, including advanced projects and sustainment projects, and allow AWACS to participate in live-fly (e.g. Joint Expeditionary Force Experiment) and ground-based interoperability testing through the Joint Distributed Engineering Plant (JDEP) configured AIL. They also support multiple international Airborne Early Warning and Control (AEW&C) projects on a fee basis, including French, RSAF, UK, Japan, and NATO.

6) NAVWAR (Navigation Warfare) is mandated by CJCSI 6140.01A (31 Mar 04) and requires all DoD GPS users to incorporate NSA Selective Availability Anti-Spoofing Module (SAASM), make provisions for the transition to 'black keys', eliminate requirements to acquire GPS satellites using the civil signal (C/A) and incorporates new technology into the navigation sensor.

7) AMP (Avionics Modernization Program) completes the FAA/International Civil Aviation Organization (ICAO)/EUROCONTROL mandated air traffic control system upgrades and equips the E-3 fleet with flight deck and other avionics capabilities that will allow AWACS to comply with mandated global Required Navigation Performance (RNP), surveillance and communication standards. Non-compliance will result in airspace restrictions and denials which will impact AWACS ability to support worldwide responses to situations requiring immediate on-scene command and control (C2 battle management). The AMP modifications to the flight deck include the addition of data link communications, voice and data link digital radios, improved visual displays and flight management system, as well as automatic position reporting via data link. Replacement of critical avionics subsystems, unsustainable beyond 2010, will be included in the AMP.

Exhibit R-2, RDT&E Budget Item Justification	DATE February 2005
BUDGET ACTIVITY 07 Operational System Development	PE NUMBER AND TITLE 0207417F Airborne Warning and Control System (AWACS)

8) Comm projects provide the AWACS system with an effective method for electronically transmitting and receiving critical mission information such as the Air Tasking Order (ATO). Comm projects will focus on engineering and retrofitting the entire fleet.

This program is in Budget Activity 7, Operational Systems Development, due to efforts supporting a fielded, post Milestone III operational weapon system.

(U) B. Program Change Summary ($ in Millions)

		FY 2004	FY 2005	FY 2006	FY 2007
(U)	Previous President's Budget	267.846	288.787	131.308	85.578
(U)	Current PBR/President's Budget	250.114	285.737	121.565	94.498
(U)	Total Adjustments	-17.732	-3.050		
(U)	Congressional Program Reductions				
	Congressional Rescissions		-3.050		
	Congressional Increases				
	Reprogrammings	-9.471			
	SBIR/STTR Transfer	-8.261			

(U) Significant Program Changes:

Funds were rephased from FY06 to FY07 to support the Block 40/45 System Development and Demonstration. Block 40/45 remains executable.

Exhibit R-2a, RDT&E Project Justification			DATE: February 2005
BUDGET ACTIVITY: 07 Operational System Development	PE NUMBER AND TITLE: 0207417F Airborne Warning and Control System (AWACS)	PROJECT NUMBER AND TITLE: 411L Airborne Warning & Control System (AWACS)	

	Cost ($ in Millions)	FY 2004 Actual	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total
411L	Airborne Warning & Control System (AWACS)	250.114	285.737	121.565	94.498	96.692	91.089	129.596	145.997	Continuing	TBD
	Quantity of RDT&E Articles	0	0	0	0	0	0	0	0		

(U) A. Mission Description and Budget Item Justification

A. Mission Description

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horizontally integrating machine-to-machine interfaces into AWACS in order to digitize the kill chain. Sensor and communications improvements, such as IFF interrogator/transponder and the ability to send, receive and fuse the air (and ground) picture via data link to fighter aircraft, will be developed through rapid prototyping, modeling, simulation and participation in live and simulated Joint exercises (e.g., Joint Combat Identification Evaluation Team (JCIET) and Joint Distributed Engineering Plant (JDEP)). Collaborative efforts with other sensor platforms through capabilities such as network-centric operations will also enhance horizontal integration efforts. Certain near-term efforts, required by the operator to improve the timeliness and accuracy of information passed to/from fighter aircraft in the engagement zone and to provide consistent and re-playable mission data once the mission is complete, are quick reaction capabilities that can be developed & fielded to support the next air war. The program includes concept exploration, technology development and demonstration efforts that support continuous improvements to C2ISR capabilities of manned & unmanned platforms, space, data links and advanced Battle Management decision tools. C2ISR continues to support and develop self-protection capabilities to enable current and future threat deterrence. Fielding strategies will provide for immediate field retrofit when able, otherwise fielding will occur in subsequent modernization programs. All programs are designed to integrate with & transition into the next C2ISR Platform. The AWACS program will coordinate with and participate in projects developing international standards (including NATO standards) to ensure joint, allied, and coalition interoperability. The E-3 will serve as the lead platform to support the development of the Mark XXIIA Mode 5 IFF capability carried out in PE 63742F, Combat ID Technology.

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Exhibit R-2a, RDT&E Project Justification		DATE February 2005
BUDGET ACTIVITY **07 Operational System Development**	PE NUMBER AND TITLE **0207417F Airborne Warning and Control System (AWACS)**	PROJECT NUMBER AND TITLE **411L Airborne Warning & Control System (AWACS)**

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(U)	**B. Accomplishments/Planned Program ($ in Millions)**	FY 2004	FY 2005	FY 2006	FY 2007
(U)	Accomplishments/Planned Programs	0.000			
(U)	Continuing Test System-3/AITS support and Program Sustaining efforts	29.506	13.292	17.520	17.612
(U)	Continuing Trainers, Simulators and Infrastructure (TSI) efforts (previously included under Test System-3/AITS support and Program Sustaining efforts)		4.592	2.239	3.228
(U)	Continuing Block 40/45 SD&D effort	191.856	255.683	90.876	67.855
(U)	Completing Integrated DAMA/GATM (IDG) SD&D (combination of ATC Compliance & SATCOM DAMA)	25.177	0.000	0.000	0.000
(U)	Continuing C2ISR System Architecture Improvements, Advanced Projects, MC Rate Improvements	3.575	5.211	6.090	5.803
(U)	Continuing Navigational Warfare (NAVWAR) SD&D		6.959	4.840	0.000
(U)	Total Cost	250.114	285.737	121.565	94.498

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

		FY 2004 Actual	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	Cost to Complete	Total Cost
(U)	AF RDT&E										
(U)	Other APPN										
(U)	Aircraft Procurement, AF, E-3 Mods	54.882	35.477	49.164	135.271	211.007	209.559	413.758	411.850	Continuing	TBD
(U)	E-3 Initial Spares, AF	8.324	8.726	7.096	7.305	7.583	7.871	10.812	18.458	Continuing	TBD
(U)	Replacement Supt Equip	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

(U) D. Acquisition Strategy

Most major programs (IDG, Block 40/45, NAVWAR, TS-3 and lab support) will be sole source to Boeing aircraft in Seattle, Wa.

Exhibit R-3, RDT&E Project Cost Analysis

DATE: **February 2005**

BUDGET ACTIVITY: **07 Operational System Development**

PE NUMBER AND TITLE: **0207417F Airborne Warning and Control System (AWACS)**

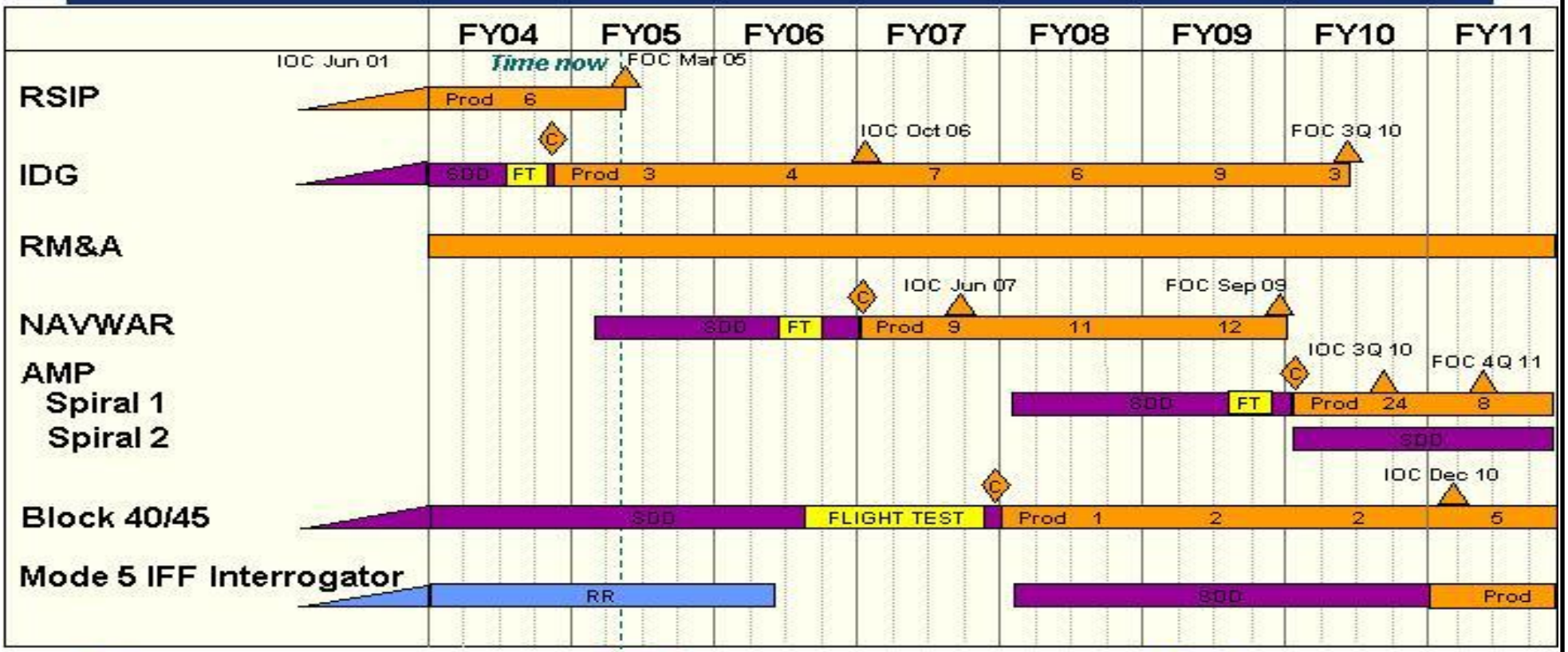
PROJECT NUMBER AND TITLE: **411L Airborne Warning & Control System (AWACS)**

(U) Cost Categories (Tailor to WBS, or System/Item Requirements) ($ in Millions)	Contract Method & Type	Performing Activity & Location	Total Prior to FY 2004 Cost	FY 2004 Cost	FY 2004 Award Date	FY 2005 Cost	FY 2005 Award Date	FY 2006 Cost	FY 2006 Award Date	FY 2007 Cost	FY 2007 Award Date	Cost to Complete	Total Cost	Target Value of Contract
(U) Product Development														
(U) Block 40/45 SD&D	SS/CPAF	Boeing - Seattle, WA	22.286	184.569	Oct-03	244.091	Oct-04	77.310	Oct-05	57.288	Oct-06	Continuing	TBD	TBD
(U) PDMA*	SS/Multiple	Boeing - Seattle, WA	58.149									Continuing	TBD	TBD
(U) C2ISR Sys Arch Imp	SS/FPIF & CPAF	Boeing - Seattle, WA	39.030	1.538	Nov-03	3.062	Nov-03	3.690	Oct-05	3.403	Oct-06	Continuing	TBD	TBD
(U) IDG	SS/CPIF	Boeing - Seattle, WA	27.313	24.602	Oct-03							0.000	51.915	51.915
(U) NAVWAR/AMP	SS/Mulipl e	Boeing - Seattle, WA	0.000			6.331	Nov-04	4.241	Oct-05			Continuing	TBD	TBD
Subtotal Product Development			146.778	210.709		253.484		85.241		60.691		Continuing	TBD	TBD
Remarks:	* N/A based on Program Depot Maintenace Airframe (PDMA) Acquisition Strategy which includes multiple contracts with multiple organizations with overlapping and continuing performance periods. Note: Total Program does not include NATO funds.													
(U) Support														
(U)Support/ITSP MITRE, travel, other	Competitive Multiple	AWACS Program Office - Hanscom AFB, MA	597.884	15.931	N/A	19.184	N/A	21.431	N/A	17.888	N/A	Continuing	TBD	TBD
Subtotal Support			597.884	15.931		19.184		21.431		17.888		Continuing	TBD	TBD
Remarks:														
(U) Test & Evaluation														
(U) Test System-3 ADAPT Contract/AITS Contract / Other test activities	SS/Multiple	Boeing - Seattle, WA	391.742	23.474	N/A	8.477	N/A	12.654	N/A	12.691	N/A	Continuing	TBD	TBD
(U) Trainers, Simulators & Infrastructure (TSI)	SS/Multiple	Boeing - Seattle, WA	0.000			4.592	Jan-05	2.239	Jan-06	3.228	Jan-07	Continuing	TBD	TBD
Subtotal Test & Evaluation			391.742	23.474		13.069		14.893		15.919		Continuing	TBD	TBD
Remarks:														
(U) Management														
													0.000	0.000
Subtotal Management			0.000	0.000		0.000		0.000		0.000		0.000	0.000	0.000
Remarks:														
(U) Total Cost			1,136.404	250.114		285.737		121.565		94.498		Continuing	TBD	TBD

Exhibit R-4, RDT&E Schedule Profile		DATE: February 2005
BUDGET ACTIVITY: 07 Operational System Development	PE NUMBER AND TITLE: 0207417F Airborne Warning and Control System (AWACS)	PROJECT NUMBER AND TITLE: 411L Airborne Warning & Control System (AWACS)

U.S. AIR FORCE

AWACS Schedule



Depicted by production flow & limiting a/c configurations to two

1

Exhibit R-4a, RDT&E Schedule Detail			DATE: February 2005
BUDGET ACTIVITY: 07 Operational System Development	PE NUMBER AND TITLE: 0207417F Airborne Warning and Control System (AWACS)	PROJECT NUMBER AND TITLE: 411L Airborne Warning & Control System (AWACS)	

(U) Schedule Profile	FY 2004	FY 2005	FY 2006	FY 2007
(U) IDG AIL Integration & Testing Start	1Q			
(U) IDG Test Aircraft Modification Start	1Q			
(U) 40/45 Initial Design & Manufacturing Review (IDMR)	2Q			
(U) IDG Ground & Flight Testing	3Q			
(U) IDG Production Contract Award	4Q			
(U) 40/45 Final Design & Manufacturing Review (FDMR)	4Q			
(U) NAVWAR SD&D Contract Award		1Q		
(U) RSIP Aircraft Modifications Complete		1Q		
(U) 40/45 Test Aircraft Modification Start		2Q		
(U) NAVWAR Software Development Progress Review		3Q		
(U) IDG Production Aircraft Modification Start		3Q		
(U) IDG Delta Testing			1Q	
(U) 40/45 Airworthiness Testing			1Q	
(U) NAVWAR Flight Tests			2Q	
(U) 40/45 Install & Checkout Complete			3Q	
(U) 40/45 Ground/Flight Test Starts			3Q	
(U) IDG Follow-On Contract Award			3Q	
(U) 40/45 Long Lead Decision			4Q	
(U) IDG IOC				1Q
(U) AMP Risk Reduction & RFP				2Q
(U) NAVWAR IOC				3Q
(U) 40/45 Ground/Flight Test Complete				3Q
(U) 40/45 IOT&E Complete				4Q
(U) 40/45 Milestone C				4Q