Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Army

DATE: February 2010

APPROPRIATION/BUDGET ACTIVITY

R-1 ITEM NOMENCLATURE

2040: Research, Development, Test & Evaluation, Army

PE 0604633A: AIR TRAFFIC CONTROL

BA 5: Development & Demonstration (SDD)

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	16.092	7.538	9.892	0.000	9.892	12.001	6.672	6.823	6.948	Continuing	Continuing
586: AIR TRAFFIC CONTROL	16.092	7.538	9.892	0.000	9.892	12.001	6.672	6.823	6.948	Continuing	Continuing

A. Mission Description and Budget Item Justification

This program element (PE) funds continuous efforts in the development of modernized tactical and fixed base Air Traffic Control (ATC) systems that will significantly enhance aviation safety in both the tactical and strategic ATC domains. ATC systems are required to achieve or maintain compliance with civil, military, domestic and international air traffic control and combat identification requirements and mandates. Funding will be utilized to develop, evaluate and integrate candidate technology mandates. Funded in this program element is the development of the Tactical Airspace Integration System (TAIS) Service Oriented Architecture (SOA) and Airspace Improvements Initiative, Advanced Surveillance, Air Traffic Navigation Integration and Coordination System (ATNAVICS) modernization, Mobile Tower System (MOTS), Tactical Terminal Control System (TTCS) Pre-Planned Product Improvements (P3I), Fixed Base Precision Approach Radar (FBPAR) P3I, and maintenance monitoring. ATNAVICS provides all weather instrument flight capabilities to include enroute, terminal, radar precision approach and landing services to all Army, Joint, and allied aircraft. The MOTS is a tactical mobile tower designed to meet the deployability and communication requirements of the current to future force. TAIS SOA develops software and required hardware for airspace management web services, to operate effectively in a dynamic net-centric high band-width interconnected environment. TAIS also integrates advanced surveillance interfaces to further enhance a dynamic airspace management capability. FBPAR is the Army's primary ground controlled precision approach capability to provide recovery operations for aircraft to fixed base airfields during adverse weather conditions. TTCS provides enhanced Air Traffic Services (ATS) communications support to aviation assets conducting reconnaissance, maneuver, medical evacuation, logistics, and intelligence operations across the battlefield. Maintenance monitoring is a remote maintenance capability for ATC systems. Funded project improvements to ATC systems, including the TAIS and ATNAVICS, will align these programs with advanced networking and communications goals, and provide compatibility with the Army Aviation aircraft and avionics upgrade programs including Global Air Traffic Management. In a networked battlefield, joint service systems and radars provide operational data to ATC missions assuming a communications infrastructure and data processing capability is embedded in ATC systems. ATC systems control maintain information relevant to higher level organizations or other external systems; advanced networks and communications allow such information to be transmitted, to include aircraft positional information, weather data, landing surface conditions, airspace density, airspace control orders, restricted airspace, and flight plan data. As the Department of Defense transitions military aircraft to positional self-reporting technologies, Product Manager ATC will demonstrate and test these various technologies prior to integration into the ATC systems. Advanced surveillance relies on aircraft self-reporting technologies which include Automatic Dependent Surveillance Broadcast (ADS-B), Mode 5 and Mode S. Initial testing and integration of these systems are foundational to Advanced Surveillance to increase ATC systems availability to detect, manage, and disseminate aircraft information. ATNAVICS will network its surveillance data to aviation and joint network nodes. TAIS, as a Battlefield Automated System (BAS) of the Army Battle Command System (ABCS), requires the development and testing of web-based services for Airspace Command and Control (AC2) and ATS, and integration of these new web-based services into a SOA supporting Army Battle Command, ATS and Dynamic Airspace Management through advanced surveillance interfaces and providing TAIS situational awareness to the cockpit. TAIS RDTE also includes separate TAIS P3I efforts in FY 09/10, FY12/13 and FY 15. TAIS P3I include, but are not limited to, developing and testing improvements to the air picture adding unmanned aircraft positions. To facilitate increased maintenance and system support, a

Exhibit R-2, RDT&E Budget Item Justification: PB 2011 Army

DATE: February 2010

APPROPRIATION/BUDGET ACTIVITY

R-1 ITEM NOMENCLATURE

2040: Research, Development, Test & Evaluation, Army

PE 0604633A: AIR TRAFFIC CONTROL

BA 5: Development & Demonstration (SDD)

remote maintenance capability will be developed for robust maintenance and troubleshooting. FBPAR includes upgrading computer capability. TTCS P3I includes enhanced capability for situational awareness through Force XXI Battle Command, Brigade-and-Below (FBCB2) and interoperability with TAIS.

B. Program Change Summary (\$ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Previous President's Budget	14.167	7.578	9.657	0.000	9.657
Current President's Budget	16.092	7.538	9.892	0.000	9.892
Total Adjustments	1.925	-0.040	0.235	0.000	0.235
 Congressional General Reductions 		-0.040			
 Congressional Directed Reductions 		0.000			
 Congressional Rescissions 	0.000	0.000			
 Congressional Adds 		0.000			
 Congressional Directed Transfers 		0.000			
 Reprogrammings 	2.300	0.000			
 SBIR/STTR Transfer 	-0.375	0.000			
 Adjustments to Budget Years 	0.000	0.000	0.235	0.000	0.235

Change Summary Explanation

Funding ChangesFY09: +\$2.300M for a critical 2nd Engineering Development Model for the Mobile Tower System.

Exhibit R-2A, RDT&E Project Justif	ication: PB 2	011 Army							DATE: Febi	ruary 2010	
APPROPRIATION/BUDGET ACTI 2040: Research, Development, Test & H BA 5: Development & Demonstration (NOMENCLA A: <i>AIR TRAF</i>	_	PROJECT 586: AIR TRAFFIC CONTROL							
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
586: AIR TRAFFIC CONTROL	16.092	7.538	9.892	0.000	9.892	12.001	6.672	6.823	6.948	Continuing	Continuing
Quantity of RDT&E Articles											

A. Mission Description and Budget Item Justification

This program element (PE) funds continuous efforts in the development of modernized tactical and fixed base Air Traffic Control (ATC) systems that will significantly enhance aviation safety in both the tactical and strategic ATC domains. ATC systems are required to achieve or maintain compliance with civil, military, domestic, and international air traffic control and combat identification requirements and mandates. Funding will be utilized to develop, evaluate and integrate candidate technology mandates. Funded in this program element is the development of the Tactical Airspace Integration System (TAIS) Service Oriented Architecture (SOA) and Airspace Improvements Initiative, Advanced Surveillance, Air Traffic Navigation Integration and Coordination System (ATNAVICS) modernization, Mobile Tower System (MOTS), Tactical Terminal Control System (TTCS) Pre-Planned Product Improvements (P3I), Fixed Base Precision Approach Radar (FBPAR) P3I, and maintenance monitoring. ATNAVICS provides all weather instrument flight capabilities to include enroute, terminal, radar precision approach and landing services to all Army, Joint, and allied aircraft. The MOTS is a tactical mobile tower designed to meet the deployability and communication requirements of the current to future force. TAIS SOA develops software and required hardware for airspace management web services, to operate effectively in a dynamic net-centric, high band-width interconnected environment. TAIS also integrates advanced surveillance interfaces to further enhance a dynamic airspace management capability. FBPAR is the Army's primary ground controlled precision approach capability to provide recovery operations for aircraft to fixed base airfields during adverse weather conditions. TTCS provides enhanced Air Traffic Services (ATS) communications support to aviation assets conducting reconnaissance, maneuver, medical evacuation, logistics, and intelligence operations across the battlefield. Maintenance monitoring is a remote maintenance capability for ATC systems. Funded project improvements to ATC systems, including the TAIS and ATNAVICS, will align these programs with advanced networking and communications goals, and provide compatibility with the Army Aviation aircraft and avionics upgrade programs including Global Air Traffic Management. In a networked battlefield, joint service systems and radars provide operational data to ATC missions assuming a communications infrastructure and data processing capability is embedded in ATC systems. ATC systems control or maintain information relevant to higher level organizations or other external systems; advanced networks and communications allow such information to be transmitted, to include aircraft positional information, weather data, landing surface conditions, airspace density, airspace control orders, restricted airspace, and flight plan data. As the Department of Defense transitions military aircraft to positional self reporting technologies, Product Manager ATC will demonstrate and test these various technologies prior to integration into the ATC systems. Advanced surveillance relies on aircraft self-reporting technologies which include Automatic Dependent Surveillance Broadcast (ADS-B), Mode 5, and Mode S. Initial testing and integration of these systems are foundational to Advanced Surveillance to increase ATC systems availability to detect, manage, and disseminate aircraft information. ATNAVICS will network its surveillance data to aviation and joint network nodes. TAIS, as a Battlefield Automated System (BAS) of the Army Battle Command System (ABCS), requires the development and testing of web-based services for Airspace Command and Control (AC2) and ATS, and integration of these new web-based services into a SOA supporting Army Battle Command, ATS and Dynamic Airspace Management through advanced surveillance interfaces and providing TAIS situational awareness to the cockpit. TAIS RDTE also include separate TAIS P3I efforts in FY 09/10, FY12/13 and FY 15. TAIS P3I include, but are not limited to, developing and testing improvements to the air picture adding unmanned aircraft positions. To facilitate increased maintenance and system support, a

Exhibit R-2A, RDT&E Project Justification: PB 2011 Army			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY	R-1 ITEM NOMENCLATURE	PROJECT	
2040: Research, Development, Test & Evaluation, Army	PE 0604633A: AIR TRAFFIC CONTROL	586: AIR TR	AFFIC CONTROL
BA 5: Development & Demonstration (SDD)			

remote maintenance capability will be developed for robust maintenance and troubleshooting. FBPAR includes upgrading computer capability. TTCS P3I includes enhanced capability for situational awareness through Force XXI Battle Command, Brigade-and-Below (FBCB2) and interoperability with TAIS.

B. Accomplishments/Planned Program (\$ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Program #1	12.595	2.473	0.000	0.000	0.000
MOTS System Development, Demonstration & Testing					
FY 2009 Accomplishments: FY 2009					
FY 2010 Plans: FY 2010					
FY 2011 Base Plans: FY 2011 Base					
FY 2011 OCO Plans: FY 2011 OCO					
Program #2	2.020	3.409	5.000	0.000	5.000
TAIS Native New Web Services Dev (AVN BOS) (Formerly BC migration)					
FY 2009 Accomplishments: FY 2009					
FY 2010 Plans: FY 2010					

			DATE: Febr	uary 2010	
R-1 ITEM NOMENCLATURE PE 0604633A: AIR TRAFFIC CONTRO	DL.	PROJECT 586: AIR TR	AFFIC CONT	ROL	
<u> </u>		1			
	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
	0.691	0.500	0.000	0.000	0.000
	0.000	0.000	2.239	0.000	2.239
		PE 0604633A: AIR TRAFFIC CONTROL FY 2009 0.691	PE 0604633A: AIR TRAFFIC CONTROL 586: AIR TR	R-1 ITEM NOMENCLATURE PROJECT 586: AIR TRAFFIC CONTROL FY 2011 FY 2009 FY 2010 FY 2011 Base	PE 0604633A: AIR TRAFFIC CONTROL 586: AIR TRAFFIC CONTROL FY 2010 FY 2011 FY 2011 GOOD GOOD

Exhibit R-2A, RDT&E Project Justification: PB 2011 Army				DATE: Febr	uary 2010	
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 5: Development & Demonstration (SDD)	R-1 ITEM NOMENCLATURE PE 0604633A: AIR TRAFFIC CONTROL	,	PROJECT 586: AIR TRA	AFFIC CONT	ROL	
B. Accomplishments/Planned Program (\$ in Millions)			I			
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
FY 2010 Plans: FY 2010						
FY 2011 Base Plans: FY 2011 Base						
FY 2011 OCO Plans: FY 2011 OCO						
Program #5		0.000	0.000	1.982	0.000	1.982
Advanced Surveillance						
FY 2009 Accomplishments: FY 2009						
FY 2010 Plans: FY 2010						
FY 2011 Base Plans: FY 2011 Base						
FY 2011 OCO Plans: FY 2011 OCO						
Program #6		0.685	0.840	0.561	0.000	0.561
Tech and Log support						

Exhibit R-2A, RDT&E Project Justification: PB 2011 Army				DATE: Febr	uary 2010		
APPROPRIATION/BUDGET ACTIVITY 2040: Research, Development, Test & Evaluation, Army BA 5: Development & Demonstration (SDD)	R-1 ITEM NOMENCLATURE PE 0604633A: AIR TRAFFIC CONTR	OL	PROJECT 586: AIR TR	PAFFIC CONT	AFFIC CONTROL		
B. Accomplishments/Planned Program (\$ in Millions)	,						
		FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total	
FY 2009 Accomplishments: FY 2009							
FY 2010 Plans: FY 2010							
FY 2011 Base Plans: FY 2011 Base							
FY 2011 OCO Plans: FY 2011 OCO							
Program #7		0.101	0.105	0.110	0.000	0.11	
Program Management Support							
FY 2009 Accomplishments: FY 2009							
FY 2010 Plans: FY 2010							
FY 2011 Base Plans: FY 2011 Base							
FY 2011 OCO Plans: FY 2011 OCO							

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0.000

0.211

0.000

0.000

0.000

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Program #8

Exhibit R-2A, RDT&E Project Justification: PB 2011 Army

APPROPRIATION/BUDGET ACTIVITY

2040: Research, Development, Test & Evaluation, Army

PE 0604633A: AIR TRAFFIC CONTROL

DATE: February 2010

R-1 ITEM NOMENCLATURE
PE 0604633A: AIR TRAFFIC CONTROL
586: AIR TRAFFIC CONTROL

BA 5: Development & Demonstration (SDD)

B. Accomplishments/Planned Program (\$ in Millions)

	FY 2009	FY 2010	FY 2011 Base	FY 2011 OCO	FY 2011 Total
Small Business Innovative Research/Small Business Technology Transfer Programs					
FY 2009 Accomplishments: FY 2009					
FY 2010 Plans: FY 2010					
FY 2011 Base Plans: FY 2011 Base					
FY 2011 OCO Plans: FY 2011 OCO					
Accomplishments/Planned Programs Subtotals	16.092	7.538	9.892	0.000	9.892

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

			<u>FY 2011</u>	<u>FY 2011</u>	<u>FY 2011</u>					Cost To	
<u>Line Item</u>	FY 2009	FY 2010	Base	<u>OCO</u>	<u>Total</u>	FY 2012	FY 2013	FY 2014	FY 2015	Complete	Total Cost
• Ord. #1: APA AA0050 - Air Traffic	122.413	76.808	82.844	7.555	90.399	111.739	84.916	84.487	85.693	Continuing	Continuing
Control											

D. Acquisition Strategy

PM ATC will continue to embrace new technology initiatives for the development of tactical and fixed base ATC equipment and the integration of new technology into existing systems. These systems are required to achieve or maintain compliance with civil, military, domestic and international air traffic control and combat identification requirements and mandates. Funding will be utilized to develop, evaluate, and integrate candidate systems in each key technology area. Technology insertion will be acquired through contract modifications, engineering services tasks, and new/follow-on contracts.

Exhibit R-2A, RDT&E Project Justification: PB 2011 Army		DATE: February 2010						
PPROPRIATION/BUDGET ACTIVITY 040: Research, Development, Test & Evaluation, Army A 5: Development & Demonstration (SDD)	R-1 ITEM NOMENCLATURE PE 0604633A: <i>AIR TRAFFIC CONTROL</i>	PROJECT 586: AIR TRAFFIC CONTROL						
. Performance Metrics								
Performance metrics used in the preparation of this justification mat	nce metrics used in the preparation of this justification material may be found in the FY 2010 Army Performance Budget Justification Be							

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Army

DATE: February 2010

APPROPRIATION/BUDGET ACTIVITY

R-1 ITEM NOMENCLATURE

PROJECT

2040: Research, Development, Test & Evaluation, Army BA 5: Development & Demonstration (SDD)

PE 0604633A: AIR TRAFFIC CONTROL

586: AIR TRAFFIC CONTROL

Product Development (\$ in Millions)

				FY:	2010	FY :	2011 ase	FY 2		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
MOTS System Development and Demo	C/CPFF	Sierra Nevada Corp Sparks, Nevada	19.754	0.774		0.000		0.000		0.000	Continuing	Continuing	0
MOTS Systems Development Support	С	AMCOM Huntsville, AL and ATEC, Alexandria, VA	0.848	0.125		0.000		0.000		0.000	Continuing	Continuing	0
MOTS Contracted Services	С	AMCOM Location could not be determined.	0.482	0.444		0.000		0.000		0.000	Continuing	Continuing	0
TAIS Native New Web Services Dev (AVN BOS) (Formerly BC Migration)	SS/CPFF	General Dynamics C4S Huntsville, AL	3.204	3.409		5.000		0.000		5.000	Continuing	Continuing	0
TAIS P3I	SS/CPFF	General Dynamics C4S Huntsville, AL	0.000	0.500		0.000		0.000		0.000	Continuing	Continuing	0
ATNAVICS Modernization	SS/CPFF	Raytheon Marlboro, MA	0.000	0.000		2.239		0.000		2.239	Continuing	Continuing	0
Advanced Surveillance	C/Various	Various Location could not be determined.	0.000	0.000		1.982		0.000		1.982	Continuing	Continuing	0
Tech and Log Development Support	С	PM ATC Redstone	1.691	0.840		0.561		0.000		0.561	Continuing	Continuing	0
Cost Category Item is empty.	C	Nothing entered for Activity and Location. Location could not be determined.	0.000	0.000		0.000		0.000		0.000	Continuing	Continuing	0

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Army

DATE: February 2010

APPROPRIATION/BUDGET ACTIVITY

R-1 ITEM NOMENCLATURE

PROJECT

2040: Research, Development, Test & Evaluation, Army BA 5: Development & Demonstration (SDD)

PE 0604633A: AIR TRAFFIC CONTROL

586: AIR TRAFFIC CONTROL

Product Development (\$ in Millions)

•		,		FY :	2010		2011 ase	FY:	2011 CO	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
		Subtotal	25.979	6.092		9.782		0.000		9.782			0.000

Remarks

Test and Evaluation (\$ in Millions)

				FY	2010	FY :	2011 ase	FY 2	2011 CO	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
MOTS Prototype Testing	С	Various Location could not be determined.	0.802	1.130		0.000		0.000		0.000	Continuing	Continuing	0
		Subtotal	0.802	1.130		0.000		0.000		0.000			0.000

Remarks

Management Services (\$ in Millions)

		,		FY	2010	FY 2 Ba	2011 ase		2011 CO	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
	С	PM ATC	2.021	0.105		0.110		0.000		0.110	Continuing	Continuing	0

Exhibit R-3, RDT&E Project Cost Analysis: PB 2011 Army			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY	R-1 ITEM NOMENCLATURE	PROJECT	
2040: Research, Development, Test & Evaluation, Army	PE 0604633A: AIR TRAFFIC CONTROL	586: AIR TR	AFFIC CONTROL
BA 5: Development & Demonstration (SDD)			

Management Services (\$ in Millions)

				FY 2010			2011 ase	FY 2	2011 CO	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
Program Management Support		Redstone Arsenal, AL											
SBIR/STTR	С	Nothing entered for Activity and Location. Location could not be determined.	0.000	0.211		0.000		0.000		0.000	Continuing	Continuing	0
		Subtotal	2.021	0.316		0.110		0.000		0.110			0.000

Remarks

	Total Prior Years Cost	FY 2010	FY 20 Base		FY 2011 Total	Cost To Complete	Total Cost	Target Value of Contract	
Project Cost Totals	28.802	7.538	9.892	0.000	9.892	-		0.000	

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2011 Army

DATE: February 2010

APPROPRIATION/BUDGET ACTIVITY

2040: Research, Development, Test & Evaluation, Army

BA 5: Development & Demonstration (SDD)

R-1 ITEM NOMENCLATURE

PE 0604633A: AIR TRAFFIC CONTROL

PROJECT

586: AIR TRAFFIC CONTROL

]	FY 2009		I	Y 2	201	0 FY 2011				FY 2012			FY 2013			3	FY 2014				FY 2015			5			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
MOTS Milestone C								#																				
TAIS P3I Development	#	#	#	#	#	#	#																					
TAIS P3I Development - 2												#	#	#	#	#	#	#	#									
TAIS P3I Development - 3																								#	#	#	#	
ATNAVICS Modernization										#	#	#	#	#	#	#	#	#	#	#	#	#	#					
Advanced Surveillance									#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	#	
Fixed Base Par Upgrade																				#	#	#	#					
TTCS												#	#	#	#													
Maintenance Monitoring																								#	#	#	#	

Exhibit R-4A, RDT&E Schedule Details: PB 2011 Army			DATE: February 2010
APPROPRIATION/BUDGET ACTIVITY	R-1 ITEM NOMENCLATURE	PROJECT	
2040: Research, Development, Test & Evaluation, Army	PE 0604633A: AIR TRAFFIC CONTROL	586: <i>AIR TR</i> .	AFFIC CONTROL
BA 5: Development & Demonstration (SDD)			

Schedule Details

	Sta	art	E	nd
Event	Quarter	Year	Quarter	Year
MOTS Milestone C	4	2010	4	2010
TAIS P3I Development	1	2009	3	2010
TAIS P3I Development - 2	4	2011	3	2013
TAIS P3I Development - 3	4	2014	3	2015
ATNAVICS Modernization	2	2011	3	2014
Advanced Surveillance	1	2011	3	2015
Fixed Base Par Upgrade	4	2013	3	2014
TTCS	4	2011	3	2012
Maintenance Monitoring	4	2014	3	2015