Exhibit R-2, RDT&E Budget Item Justification: PB 2016 Army											Date: February 2015	
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*					R-1 Program Element (Number/Name) PE 0607131A *I Weapons and Munitions Product Improvement Programs*							
COST ($ in Millions)	**Prior Years**	**FY 2014**	**FY 2015**	**FY 2016 Base**	**FY 2016 OCO**	**FY 2016 Total**	**FY 2017**	**FY 2018**	**FY 2019**	**FY 2020**	**Cost To Complete**	**Total Cost**
Total Program Element	-	-	-	4.945	-	4.945	4.322	10.990	6.719	7.002	-	33.978
ER2: *Close Combat Technology*	-	-	-	0.870	-	0.870	0.550	3.375	1.013	1.127	-	6.935
ER5: *Indirect Fire and Fuze Technology*	-	-	-	1.771	-	1.771	1.539	4.779	2.958	2.953	-	14.000
ER6: *Direct Fire Technology and NATO Ammo Eval*	-	-	-	2.304	-	2.304	2.233	2.836	2.748	2.922	-	13.043

A. Mission Description and Budget Item Justification

ER2 - This program includes development efforts to upgrade Close Combat technologies, energetics, and munitions, such as counter explosives, grenades, demolitions, shoulder launched munitions, pyrotechnic simulators, non-lethal ammunition/systems, networked munitions and mines, that have been fielded or have received approval for full rate production. This program will identify, characterize, study, analyze, test and develop technologies to resolve close combat munition reliability, safety, environmental, storage, standardization, obsolescence and manufacturing/producibility issues.

ER5 - Indirect Fire and Fuze Technology: This program will identify, study, analyze and support enhanced lethality, range extension and standardization to improve target engagement effectiveness; increase reliability, safety, and exportability of indirect fires weapons and munitions; and reduce taxpayer costs including elimination of sole source supply of indirect fires ammunition materials as well as studies and analyses of such technology solutions in comparison to current stock pile indirect fire conventional weapons and munitions and their associated production and life cycle support processes. Additionally, environmental impacts of legacy propellants, explosives and metal parts will be studied. Replacement of hazardous materials such as Ammonium Perchlorate, Diphenylamine, Lead, etc. and addition of propellant anti-tubewear additives will remain a focus. This program supports the standardization and interoperability of legacy and new production weapons and ammunition to maximize battlefield interchangeability/compatibility between domestic US and Allied Nations under the auspices of the international Joint Ballistics Memorandum Of Understanding (JBMOU). Maximizing standardization, interchangeability, and exportability will potentially increase FMS sales of US products to maintain domestic production and economies of scale.

This program also supports the identification, study, analysis and development of fuzing technologies and safe and arm devices in production and in the field. This program will implement these technologies into fuzing systems to preclude obsolescence, maximize standardization, enhance performance, and improve the safety and exportability of existing munitions. The program addresses two major areas: (1) analysis and (2) block upgrades. Analysis efforts will identify second sources for fuzing systems that may reduce cost by providing competition, and maintain production when sources or parts are no longer available. It will also allow for the performance enhancement of current ammunition items by conducting studies of major fuze components to detect and identify latent defects. The second major area is block upgrades, which will identify and perform studies on improvements to fuzes; increase commonality of fuze components and requirements. Block upgrades will enable the introduction of the latest technologies into fuzing, keep the fuzing design current to avoid obsolescence issues, and add capabilities.

Exhibit R-2, RDT&E Budget Item Justification: PB 2016 Army	Date: February 2015
Appropriation/Budget Activity 2040: *Research, Development, Test & Evaluation, Army I* BA 7: *Operational Systems Development*	**R-1 Program Element (Number/Name)** PE 0607131A *I Weapons and Munitions Product Improvement Programs*

ER6 - Direct Fire Technology and NATO Ammo Eval: This program funding will be used to support direct fire ammunition from small caliber ammunition, 40mm grenade, medium caliber cannon ammunition and large caliber ammunition enhancements to lethality, effectiveness, survivability, accuracy and general product improvements. In addition, this program assures complete interchangeability of direct fire ammunition and weapons among all the NATO countries with all of the associated logistic, strategic and tactical advantages of the alliance. Project involves development and testing compliance of NATO standardization agreements (STANAGS) and staffing of the North American Regional Test Center (NARTC). FY 2016 funds will be used for a more lethal and safer design for 40mm grenades that will be built and tested. An improved 30mm training round for the Apache helicopter will allow pilots to see where the rounds strike. Warhead improvements for the 30mm Apache ammunition are also under development. A number of studies on potential improvements for training ammunition and better primers will be conducted.

B. Program Change Summary ($ in Millions)	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
Previous President's Budget	-	-	-	-	-
Current President's Budget	-	-	4.945	-	4.945
Total Adjustments	-	-	4.945	-	4.945
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Adjustments to Budget Years	-	-	4.945	-	4.945

Exhibit R-2A, RDT&E Project Justification: PB 2016 Army			Date: February 2015
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607131A / *Weapons and Munitions Product Improvement Programs*	Project (Number/Name) ER2 / *Close Combat Technology*	

COST ($ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
ER2: *Close Combat Technology*	-	-	-	0.870	-	0.870	0.550	3.375	1.013	1.127	-	6.935
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

ER2 is a new project in 2016. Grenades MK3A2 Replacement, Concussion Grenade Optmization Effort and Claymore Force-on-Force Training Aids, Devices, Simulators, and Simulations (TADSS) Trainer are efforts previously funded under project 296 PE 0605805A - Munitions Standardization, Effectiveness and Safety.

A. Mission Description and Budget Item Justification

This program includes development efforts to upgrade Close Combat technologies, energetics, and munitions, such as counter explosives, grenades, demolitions, shoulder launched munitions, pyrotechnic simulators, non-lethal ammunition/systems, networked munitions and mines, that have been fielded or have received approval for full rate production. This program will identify, characterize, study, analyze, test and develop technologies to resolve close combat munition reliability, safety, environmental, storage, standardization, obsolescence and manufacturing/producibility issues.

FY 2016 funds will be used to improve the MK3A2 Offensive Hand Grenade and develop an improved Claymore Force-on-Force Training Aids, Device, Simulator and Simulation (TADSS) Trainer.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
Title: MK3A2 Replacement, Concussion Grenade Optimization Effort ***Description:*** This effort incorporates modern materials and insensitive explosives to provide a safer, producible concussion grenade. Use of the MK3A2 offensive grenade has been suspended due to age and safety issues. The current MK3A2 can expose the Soldier to toxic levels of asbestos. War fighters cannot safely employ the offensive grenade. Alternate munitions such as the M84 do not satisfy User needs for incapacitation of the enemy. Effort will continue to finalize design in anticipation of Production Verification Testing (PVT) in FY16 with type classification in FY17 and full material release in FY18. ***FY 2016 Plans:*** Finalize design and specification, produce PVT test quantities, initiate Type Classification/Full Material Release (TC/FMR) documentation and PVT, Final Hazard Classification (FHC) & Insensitive Munitions (IM) testing.	-	-	0.500
Title: Claymore Force-on-Force Training Aids, Devices, Simulators, and Simulations (TADSS) Trainer ***Description:*** Develop an improved Claymore Force-on-Force Training Aids, Devices, Simulators, and Simulations (TADSS) Trainer. While the Claymore is one of the most popular items used by the soldier, the system does not have a TADSS trainer with sight, sound & Multiple Integrated Laser Engagement System (MILES) capability. Development of an improved Claymore trainer	-	-	0.370

Exhibit R-2A, RDT&E Project Justification: PB 2016 Army		Date: February 2015
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER2 / *Close Combat Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
will allow Claymore to be trained at Combat Training Centers (CTCs) and will provide more realistic and effective training for the user when they are training Claymore as an end item and when training Claymore as initiated by Spider. ***FY 2016 Plans:*** Design and test Fireset Board, Non-Pyro Claymore simulation and Multiple Integrated Laser Engagement System (MILES) Emitting Unit. Conduct a Preliminary Design Review, perform user assessments and demonstrations and a preliminary Drop and Loose Cargo test. Conduct a Systems Verification Test. All efforts will lead to delivery of a production representative prototype Claymore TADSS trainer.			
Accomplishments/Planned Programs Subtotals	-	-	0.870

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

Not Applicable for these items.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2016 Army			Date: February 2015
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607131A / *Weapons and Munitions Product Improvement Programs*	Project (Number/Name) ER2 / *Close Combat Technology*	

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Claymore Force-on-Force TADSS Trainer - Program Management	MIPR	PM CCS : Picatinny Arsenal, NJ	0.000	-		-		0.020		-		0.020	-	0.020	-
MK3A2 Replacement, Concussion Grenade Optimization Effort	MIPR	PM CCS : Picatinny Arsenal	0.000	-		-		0.020		-		0.020	-	0.020	-
		Subtotal	0.000	-		-		0.040		-		0.040	-	0.040	-

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
MK3A2 Replacement, Concussion Grenade Optimization Effort	MIPR	ARDEC : Picatinny Arsenal, NJ	0.000	-		-		0.480		-		0.480	-	0.480	-
Claymore Force-on-Force TADSS Trainer - Design, Develop and Deliver a Production Prototype	MIPR	ARDEC : Picatinny Arsenal, NJ	0.000	-		-		0.350		-		0.350	-	0.350	-
		Subtotal	0.000	-		-		0.830		-		0.830	-	0.830	-

	Prior Years	FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	-		-		0.870		-		0.870	-	0.870	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2016 Army		Date: February 2015
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER2 / *Close Combat Technology*

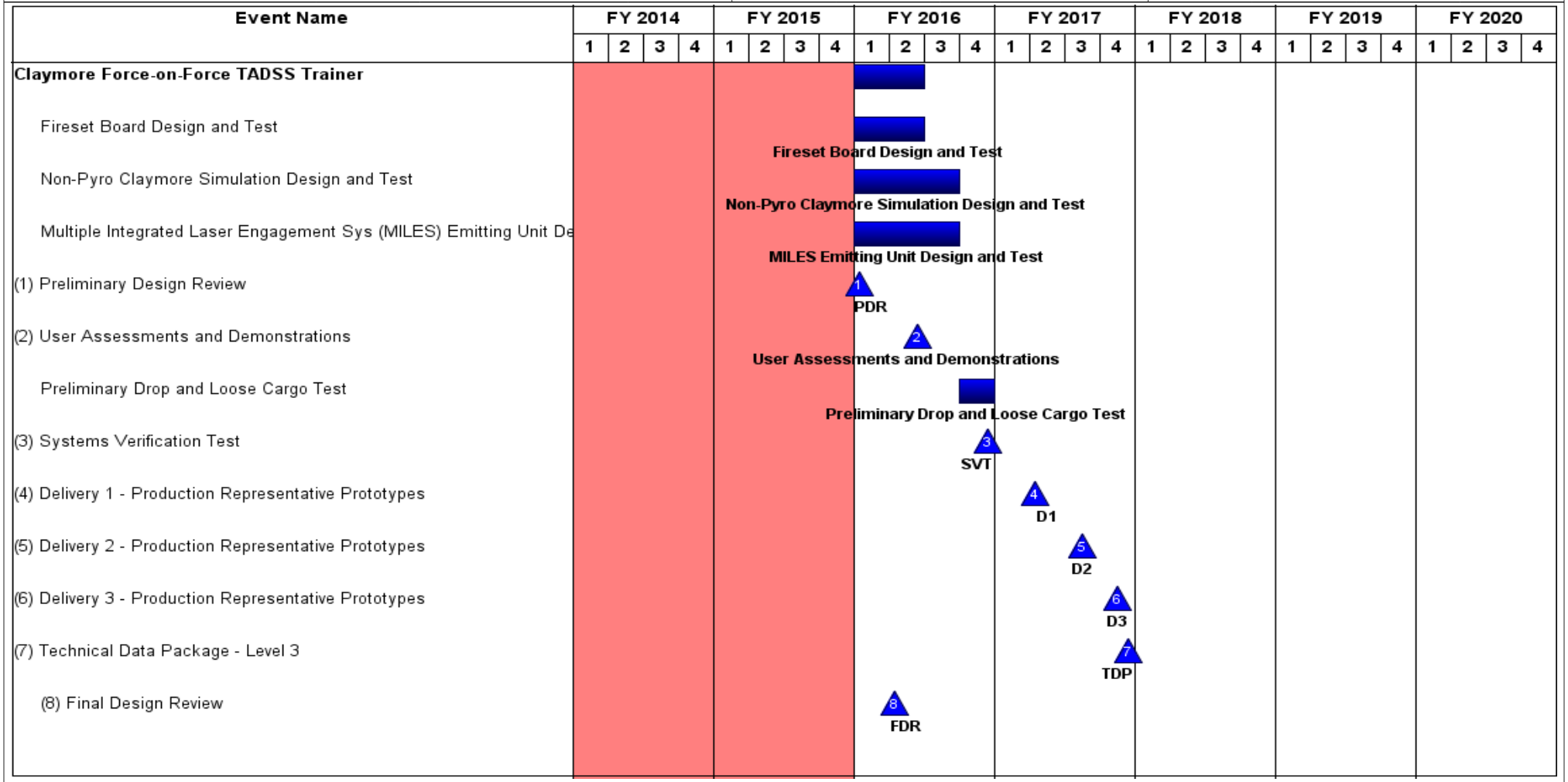

Exhibit R-4, RDT&E Schedule Profile: PB 2016 Army		Date: February 2015
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER2 / *Close Combat Technology*

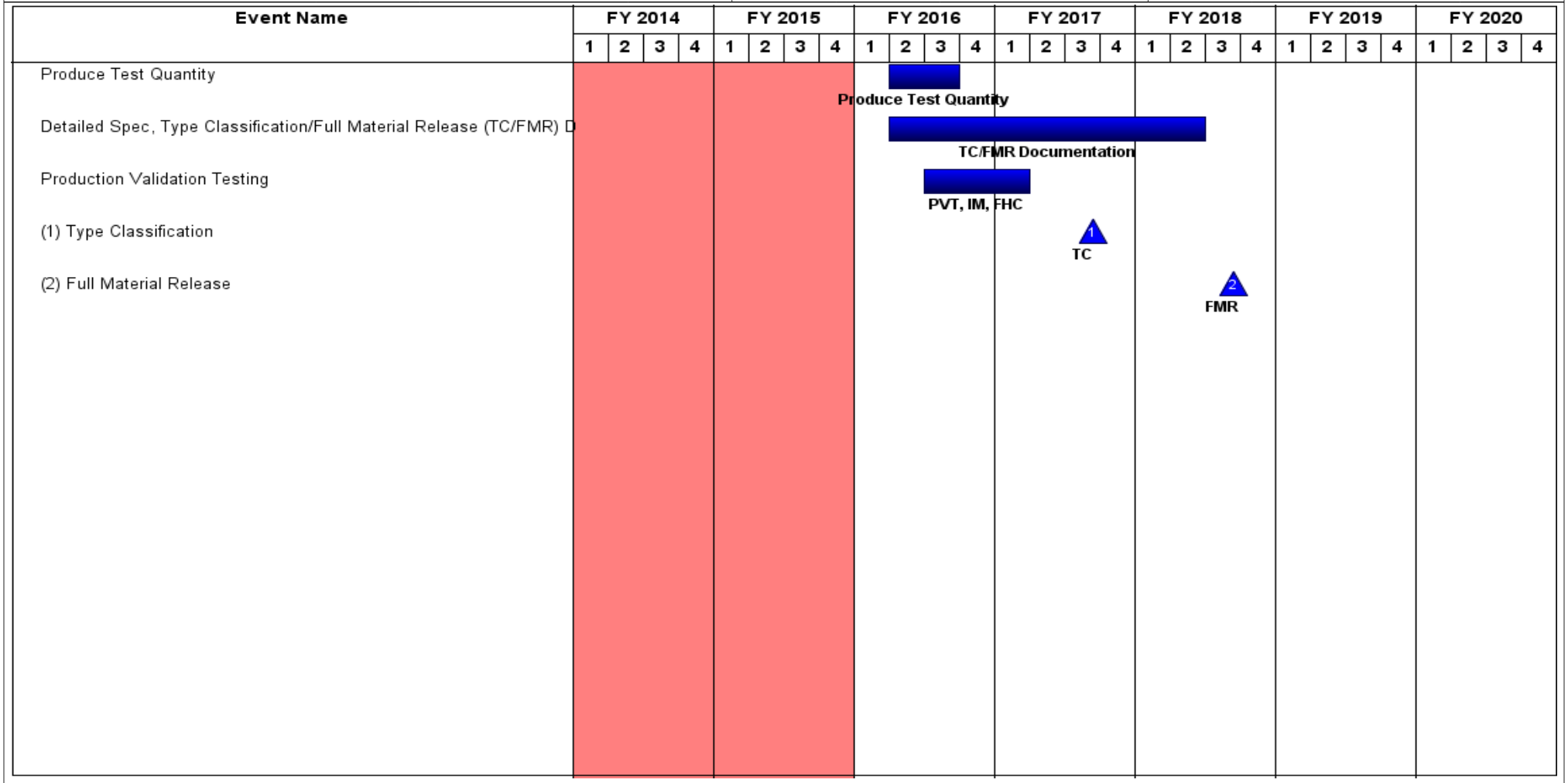

Exhibit R-4A, RDT&E Schedule Details: PB 2016 Army		Date: February 2015
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER2 / *Close Combat Technology*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Claymore Force-on-Force TADSS Trainer	1	2016	2	2016
Fireset Board Design and Test	1	2016	2	2016
Non-Pyro Claymore Simulation Design and Test	1	2016	3	2016
Multiple Integrated Laser Engagement Sys (MILES) Emitting Unit Design and Test	1	2016	3	2016
Preliminary Design Review	1	2016	1	2016
User Assessments and Demonstrations	2	2016	2	2016
Preliminary Drop and Loose Cargo Test	4	2016	4	2016
Systems Verification Test	4	2016	4	2016
Delivery 1 - Production Representative Prototypes	2	2017	2	2017
Delivery 2 - Production Representative Prototypes	3	2017	3	2017
Delivery 3 - Production Representative Prototypes	4	2017	4	2017
Technical Data Package - Level 3	4	2017	4	2017
Final Design Review	2	2016	2	2016
Produce Test Quantity	2	2016	3	2016
Detailed Spec, Type Classification/Full Material Release (TC/FMR) Documentation	2	2016	2	2018
Production Validation Testing	3	2016	1	2017
Type Classification	3	2017	3	2017
Full Material Release	3	2018	3	2018

Exhibit R-2A, RDT&E Project Justification: PB 2016 Army			Date: February 2015
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607131A / *Weapons and Munitions Product Improvement Programs*	Project (Number/Name) ER5 / *Indirect Fire and Fuze Technology*	

COST ($ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
ER5: *Indirect Fire and Fuze Technology*	-	-	-	1.771	-	1.771	1.539	4.779	2.958	2.953	-	14.000
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program supports product improvement development efforts to upgrade indirect fire weapon systems and munition that have already been fielded and/or are in production. Indirect Fire Weapons and Munitions Product Improvement Programs include enhanced lethality, range extension, improved target engagement; increased reliability, availability, maintainability, and safety; standardization and interoperability with weapons and munitions of Allied Nations; defense exportability features under the auspices of Better Buying Power; reduced taxpayer life-cycle costs; reduction of failure mechanisms and supply chain risk through introduction of new and alternative technology and material solutions; materiel and technology obsolescence mitigation; improvement of manufacturing methods and their associated production and life cycle support processes; new capabilities in response the evolving and emerging threats and countermeasures; and reduction/elimination of potential environmental and health risks associated with these products and their underlying components, materials, and production processes.

This program supports the standardization and interoperability of legacy and new production U.S. weapons and ammunition with Allied Nations to maximize battlefield interchangeability/compatibility under the auspices of the international Joint Ballistics Memorandum Of Understanding (JBMOU). Maximizing standardization, interchangeability, and exportability will also potentially increase Foreign Military Sales (FMS) of U.S. indirect fire Weapon and Munition products to maintain critical mass domestic production and affordable taxpayer costs through increased economies of scale.

This program also supports the identification, study, analysis and development of fuzing technologies and safe and arm devices in production and in the field. This program will implement these technologies into fuzing systems to preclude obsolescence, maximize standardization, enhance performance, and improve the safety and exportability of existing munitions. The program addresses two major areas: (1) analysis and (2) block upgrades. Analysis efforts will identify second sources for fuzing systems that may reduce cost by providing competition, and maintain production when sources or parts are no longer available. It will also allow for the performance enhancement of current ammunition items by conducting studies of major fuze components to detect and identify latent defects. The second major area is block upgrades, which will identify and perform studies on improvements to fuzes; increase commonality of fuze components and requirements. Block upgrades will enable the introduction of the latest technologies into fuzing, keep the fuzing design current to avoid obsolescence issues, and add capabilities.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
Title: ARDEC Fuze Technology Improvements	-	-	1.336
Description: Activities include Maturation, Validation, and Risk Reduction of fuze component alternatives to increase sources of supply, improve performance, and lower cost; the integration of fuze initiation improvements to increase reliability and lower fuze costs. Evaluation of fuze electronic upgrades to improve safety and increase performance reliability. Evaluation of inductive fuze setting improvements to lower costs. Evaluation of fuze sensing interface improvements for increased safety.			

Exhibit R-2A, RDT&E Project Justification: PB 2016 Army		Date: February 2015
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER5 / *Indirect Fire and Fuze Technology*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
FY 2016 Plans: Block Upgrades: Will mature and evaluate Micro Electro Mechanical Systems (MEMS) component packaging improvements for increased performance and lower cost. Will conduct engineering tests to demonstrate improvements to the mortar fuze electronics. Will conduct tests to prove-out the mortar fuze delay primer improvements. Will mature the mortar fuze impact switch upgrade and integrate with the fuze electronics. Will mature the fuze setback spring interface improvements. Will evaluate improvements to the inductive fuze setter interface and initialization of large caliber indirect fire munitions.			
Title: Indirect Fires Weapons And Munitions Standardization and Interoperability ***Description:*** Activities include maturation, validation, and risk reduction of battlefield interchangeability/compatibility and associated enabling technologies between U.S. and Allied 155mm weapons and munitions. ***FY 2016 Plans:*** Activities include ballistic testing including firing tables, safety, reliability and performance.	-	-	0.435
Accomplishments/Planned Programs Subtotals	-	-	1.771

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

The Joint Ballistics Memorandum of Understanding (JBMOU) Concerning the Standardization of Elements of 155mm Weapons and Ammo between United States, France, Germany, Italy, and United Kingdom was signed 18 Dec 2009. This is a FY 2016 continuation of live fire testing, evaluation, and validation and any corresponding NATO Armaments Ballistics Kernel (NABK) and Firing Control Input (FCI) database changes, enables battlefield interchangeability of existing/new 155mm cannon munitions between domestic US and NATO/Allied Nations Indirect Fires Weapons And Munitions.

This is a FY 2016 continuation of ARDEC Fuze Technology Integration (FTI) which improves current production munitions by exploiting existing fuzing technologies and inserting them into current production fuzes, providing safer, more producible, and more lethal fuzing solutions. FTI develops second source suppliers and resolve component obsolescence issues to mitigate risk and prevent production interruptions in order to continue to provide safer, more reliable munitions for the Warfighter with significant risk reduction to production fuzes also benefiting the U.S. Taxpayer. FTI will conduct ballistic tests to evaluate proximity sensor improvements that will eliminate the potential of an early M734A1 fuze function due to undesired out-range response and generate the engineering change proposals (ECPs) to incorporate changes into the M734A1 fuze Technical Data Package; will evaluate the omni-directional G-switch performance of the M433 grenade, and evaluate if it will reduce duds, due to improved reliability on soft targets and graze angles. FTI will analyze the design modification to the escapement housing to ensure the M433 High Explosive Dual Purpose (HEDP) round and M918 training rounds will decrease the risk of having a defeated safety. FTI will evaluate the design and integration of the Micro Electro

Exhibit R-2A, RDT&E Project Justification: PB 2016 Army		Date: February 2015
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER5 / *Indirect Fire and Fuze Technology*

Mechanical Systems (MEMS) G-Switch for setback sensing into the M734A1/M783 through analysis, bench and sub-scale testing. FTI will conduct tests to evaluate the delay primer improvements and evaluate changes to the explosive content of the delay primer input cup assembly which will reduce the occurrences of instantaneous firings and will subsequently generate an ECP to incorporate into the M734A1 and M783 fuze(TDPs). FTI will evaluate the improvements to the inductive fuze setter and incorporate the changes to the software that will provide cost savings and simplify integration with future weapon platforms.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2016 Army			Date: February 2015
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607131A / *Weapons and Munitions Product Improvement Programs*	Project (Number/Name) ER5 / *Indirect Fire and Fuze Technology*	

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Fuze Technology Development	MIPR	Picatinny : NJ	0.000	-		-		1.266	Dec 2015	-		1.266	-	1.266	-
		Subtotal	0.000	-		-		1.266		-		1.266	-	1.266	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Government Engineering	MIPR	Picatinny : NJ	0.000	-		-		0.235		-		0.235	-	0.235	-
		Subtotal	0.000	-		-		0.235		-		0.235	-	0.235	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Ballistic Testing	MIPR	Yuma : AZ	0.000	-		-		0.070	Mar 2016	-		0.070	-	0.070	-
Interoperability Testing	MIPR	Yuma : AZ	0.000	-		-		0.200	Jun 2016	-		0.200	-	0.200	-
		Subtotal	0.000	-		-		0.270		-		0.270	-	0.270	-

	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	-		-		1.771		-		1.771	-	1.771	-

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2016 Army		Date: February 2015
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER5 / *Indirect Fire and Fuze Technology*

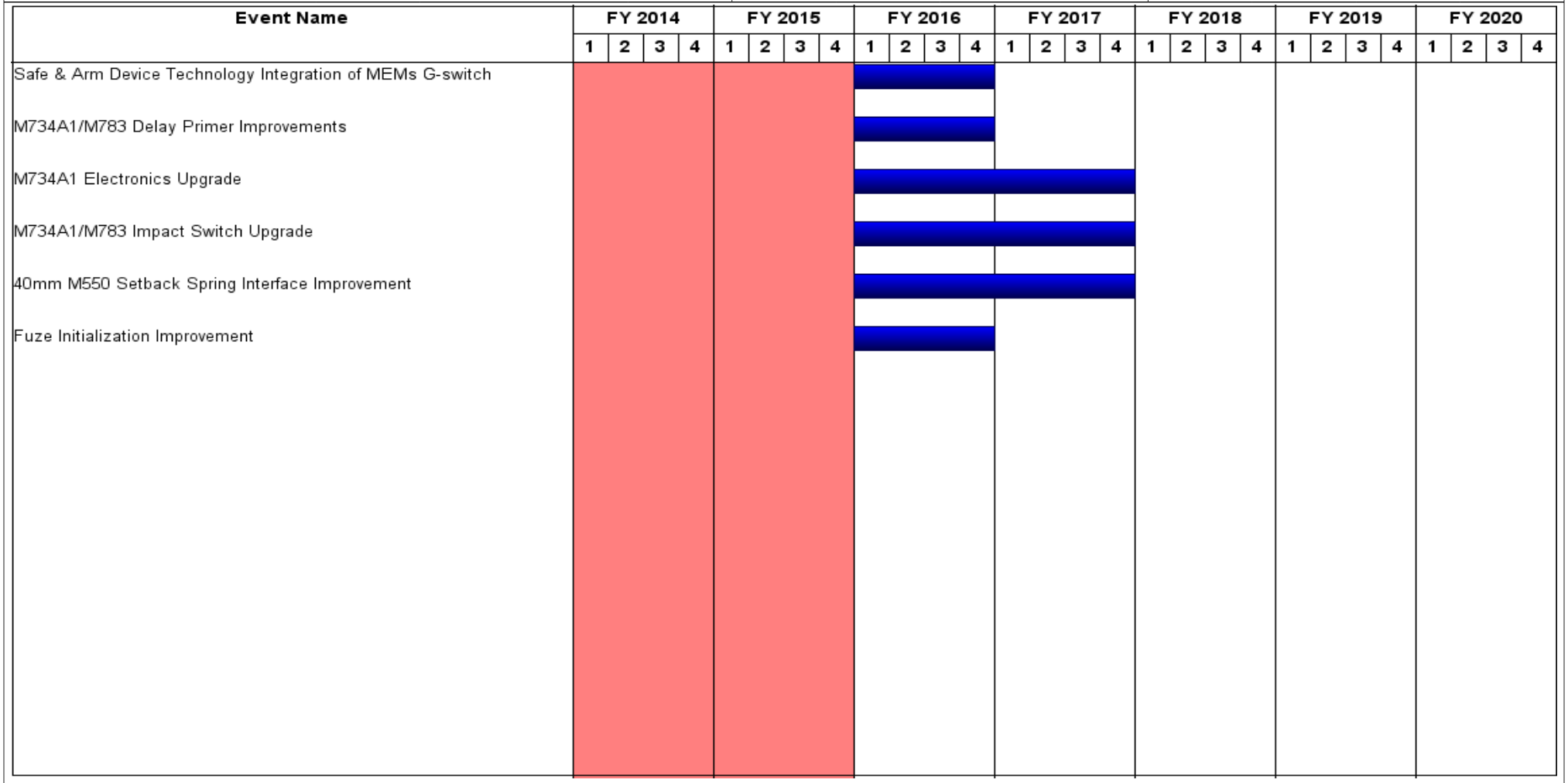

Exhibit R-4A, RDT&E Schedule Details: PB 2016 Army		Date: February 2015
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER5 / *Indirect Fire and Fuze Technology*

Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Safe & Arm Device Technology Integration of MEMs G-switch	1	2016	4	2016
M734A1/M783 Delay Primer Improvements	1	2016	4	2016
M734A1 Electronics Upgrade	1	2016	4	2017
M734A1/M783 Impact Switch Upgrade	1	2016	4	2017
40mm M550 Setback Spring Interface Improvement	1	2016	4	2017
Fuze Initialization Improvement	1	2016	4	2016

Exhibit R-2A, RDT&E Project Justification: PB 2016 Army			Date: February 2015
Appropriation/Budget Activity 2040 / 7	R-1 Program Element (Number/Name) PE 0607131A / *Weapons and Munitions Product Improvement Programs*	Project (Number/Name) ER6 / *Direct Fire Technology and NATO Ammo Eval*	

COST ($ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
ER6: *Direct Fire Technology and NATO Ammo Eval*	-	-	-	2.304	-	2.304	2.233	2.836	2.748	2.922	-	13.043
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

Direct Fire Technology and NATO Ammo Eval is currently on PE 0605805A Munitions Standardization, Effectiveness and Safety Project F21 for FY 2015 and prior.

A. Mission Description and Budget Item Justification

This program funding will be used to support direct fire ammunition from small caliber ammunition, 40mm grenade, medium caliber cannon ammunition and large caliber ammunition enhancements to lethality, effectiveness, survivability, accuracy and general product improvements. In addition, this program assures complete interchangeability of direct fire ammunition and weapons among all the NATO countries with all of the associated logistic, strategic and tactical advantages of the alliance. Project involves development and testing compliance of NATO standardization agreements (STANAGS) and staffing of the North American Regional Test Center (NARTC).

FY 2016 funds will be used for a more lethal and safer design for 40mm grenades that will be built and tested. An improved 30mm training round for the Apache helicopter will allow pilots to see where the rounds strike. Warhead improvements for the 30mm Apache ammunition are also under development. A number of studies on potential improvements for training ammunition and better primers will be conducted.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
Title: New Ammo Design Qualification & NATO Mission Support	-	-	0.200
Description: This program assures complete interchangeability of small caliber and automated cannon-caliber, and 40mm grenade ammunition and weapons among NATO countries to achieve the associated logistic, strategic and tactical advantages.			
FY 2016 Plans: Support NATO small arms ammunition interchangeability group meetings, documentation and test operations.			
Title: Small Caliber Ammunition Training Range Impact Reduction Engineering Study	-	-	0.100
Description: Perform an engineering study on the feasibility of reducing the surface danger zone of small caliber training ammunition while maintaining a ballistic match to the combat ammunition out to maximum effective range of the combat ammunition. The results of the study will assist in establishing the baseline requirements for future training ammunition.			
FY 2016 Plans:			

Exhibit R-2A, RDT&E Project Justification: PB 2016 Army		Date: February 2015
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER6 / *Direct Fire Technology and NATO Ammo Eval*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
Evaluate .50 Caliber ball and trace potential candidates.			
Title: M433 Warhead Improvement ***Description:*** 40mm: Improve lethality (fragmentation) of the M433 grenade. ***FY 2016 Plans:*** Demonstrate subsystem and system maturity by conducting two integrated system demonstration tests. Testing will confirm integration maturity and enable improvements in system manufacturing. Contracting actions will be performed to find a source to manufacture developmental test and evaluation hardware.	-	-	0.629
Title: Improved M789 Lethality, Warhead Fragmentation Improvement ***Description:*** Improve M789 warhead fragmentation for lethality by utilizing fragmentation sleeves, scoring or other technologies within the warhead to promote more efficient fragmentation. ***FY 2016 Plans:*** In FY 2016 program will encompass the production qualification of the improved design.	-	-	0.530
Title: Target Practice Spotter Technology Insertion ***Description:*** Training Cartridge with impact initiated spotting charge. Goal is visible signature upon impact under all conditions. ***FY 2016 Plans:*** Design Qualification will be pursued in FY 2016.	-	-	0.450
Title: Metastable Intermolecular Composite (MIC) Primer Lead Free Primer ***Description:*** Integrate environmental friendly lead free primary explosives within the primer of the M789 and remove lead Styphnate. Conduct small caliber 7.62mm and .50cal testing. ***FY 2016 Plans:*** Design and develop automated pilot primer line to include mixing, dispensing, drying and packaging of MIC green primers. Temperature development, mix optimization and initial testing will occur in FY 2016.	-	-	0.100
Title: Support Sniper Ammunition Integration Into Army Standard Sniper Weapons ***Description:*** Modify existing sniper ammunition to support integration into new Army standard sniper weapons. Maintain compatibility with legacy sniper weapons while improving operational availability. ***FY 2016 Plans:***	-	-	0.100

Exhibit R-2A, RDT&E Project Justification: PB 2016 Army		Date: February 2015
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2014	FY 2015	FY 2016
FY 2016 will support ammunition integration into new Army standard sniper weapons. Maintain compatibility with legacy sniper weapons while improving operational availability.			
Title: 120mm Tank Ammunition Propellant High Temperature Improvement ***Description:*** Develop improved tank ammunition propellants that can withstand higher temperatures and meet international norms. ***FY 2016 Plans:*** Study changes and conduct test fixes to determine extent of engineering required.	-	-	0.100
Title: Modular Handgun Integration ***Description:*** Support handgun ammunition integration into new Army standard handgun weapon. Maintain compatibility with handgun weapon while improving operational availability. ***FY 2016 Plans:*** FY 2016 will support ammunition integration into new Army standard handgun weapon. Maintain compatibility with legacy handgun weapon while improving operational availability.	-	-	0.050
Title: Close Combat Mission Capability Kit (CCMCK) ***Description:*** CCMCK is a user installed weapons modification system, which allows the Soldier to employ weapons at a short range for force-on-force training using low velocity marking ammunition while precluding the weapon from firing standard service ammunition. The system provides normal environmental/weapon employment cues and immediate target feedback through force-on-force, interactive live fire scenario tasks, and mission execution. ***FY 2016 Plans:*** Engineering study to analyze unmet user requirements.	-	-	0.025
Title: Improved Door Breach Munition ***Description:*** Product improved grenade rifle entry munition to allow rapid breaching beyond current capability. ***FY 2016 Plans:*** Qualify improved grenade rifle entry munition to meet user requirements.	-	-	0.020
Accomplishments/Planned Programs Subtotals	-	-	2.304

Exhibit R-2A, RDT&E Project Justification: PB 2016 Army		Date: February 2015
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C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

No contracts required.

E. Performance Metrics

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2016 Army			Date: February 2015
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Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
PM-MAS	MIPR	PM-MAS : Picatinny Arsenal, NJ	0.000	-		-		0.200		-		0.200	-	0.200	-
		Subtotal	0.000	-		-		0.200		-		0.200	-	0.200	-

Support ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
ARDEC	MIPR	ARDEC : Picatinny Arsenal, NJ	0.000	-		-		1.000		-		1.000	-	1.000	-
		Subtotal	0.000	-		-		1.000		-		1.000	-	1.000	-

Test and Evaluation ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
NSWC	MIPR	Naval Surface Warfare Center : Dahlgren, VA	0.000	-		-		0.452		-		0.452	-	0.452	-
ATC	MIPR	Aberdeen Test Center : Aberdeen, MD	0.000	-		-		0.452		-		0.452	-	0.452	-
NARTC	MIPR	North American Regional Test Center : Rock island, IL	0.000	-		-		0.200		-		0.200	-	0.200	-
		Subtotal	0.000	-		-		1.104		-		1.104	-	1.104	-

	Prior Years	FY 2014 Cost	FY 2014 Award Date	FY 2015 Cost	FY 2015 Award Date	FY 2016 Base Cost	FY 2016 Base Award Date	FY 2016 OCO Cost	FY 2016 OCO Award Date	FY 2016 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	0.000	-		-		2.304		-		2.304	-	2.304	-

Exhibit R-3, RDT&E Project Cost Analysis: PB 2016 Army			Date: February 2015
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	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2016 Army		Date: February 2015
Appropriation/Budget Activity 2040 / 7	**R-1 Program Element (Number/Name)** PE 0607131A / *Weapons and Munitions Product Improvement Programs*	**Project (Number/Name)** ER6 / *Direct Fire Technology and NATO Ammo Eval*

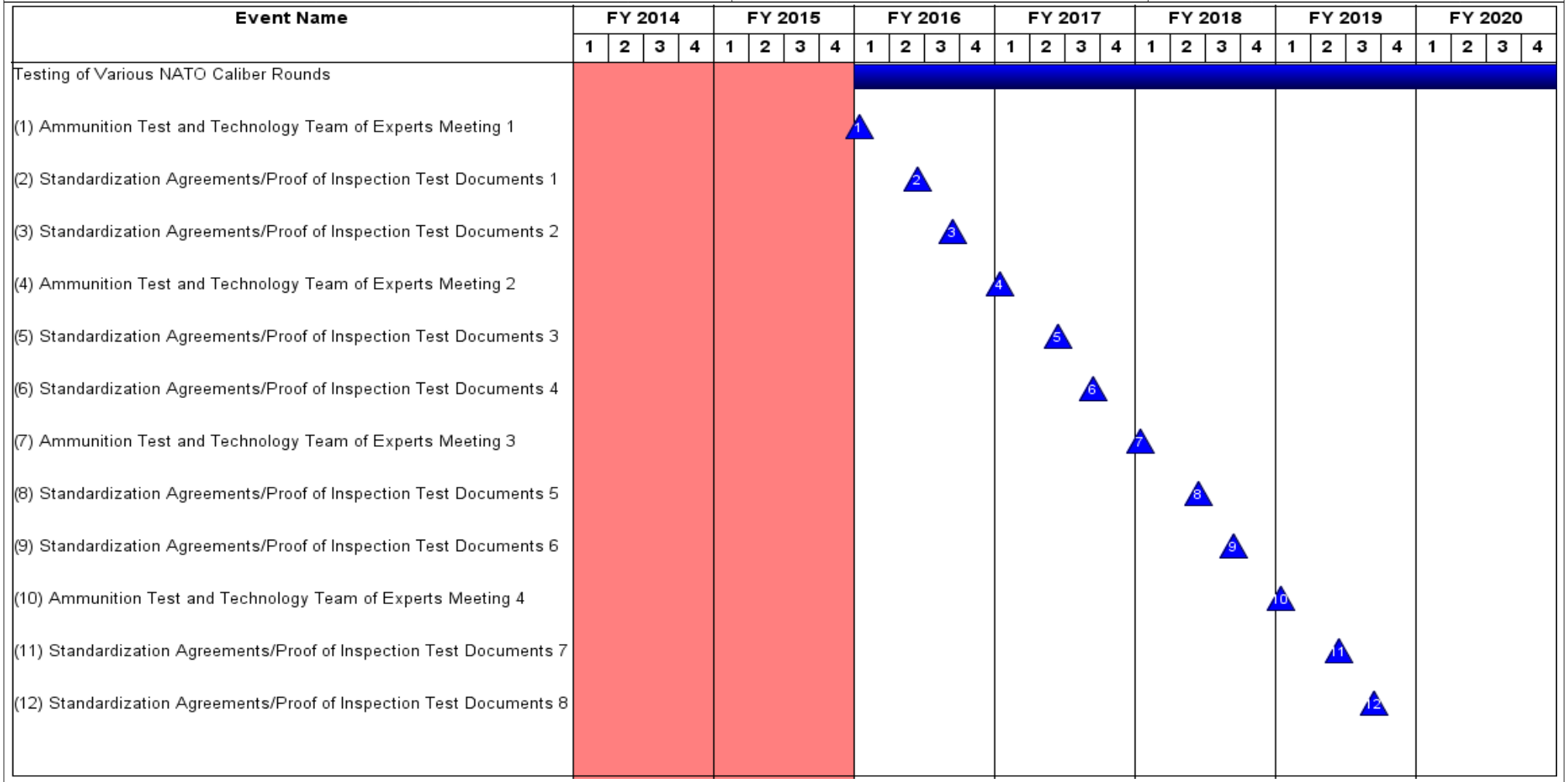

Exhibit R-4, RDT&E Schedule Profile: PB 2016 Army		Date: February 2015
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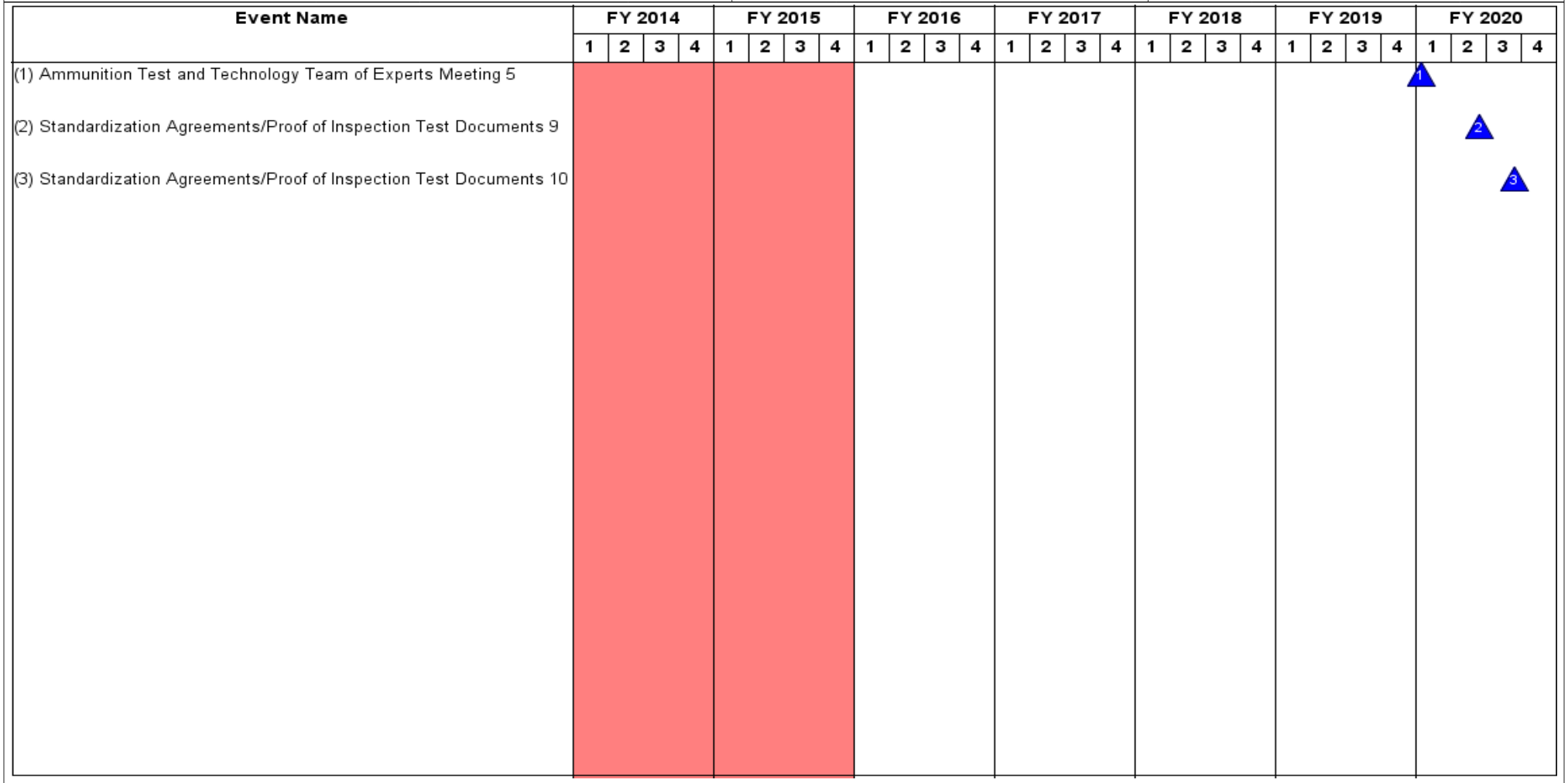

Exhibit R-4A, RDT&E Schedule Details: PB 2016 Army		Date: February 2015
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Schedule Details

	Start		End	
Events	**Quarter**	**Year**	**Quarter**	**Year**
Testing of Various NATO Caliber Rounds	1	2016	4	2020
Ammunition Test and Technology Team of Experts Meeting 1	1	2016	1	2016
Standardization Agreements/Proof of Inspection Test Documents 1	2	2016	2	2016
Standardization Agreements/Proof of Inspection Test Documents 2	3	2016	3	2016
Ammunition Test and Technology Team of Experts Meeting 2	1	2017	1	2017
Standardization Agreements/Proof of Inspection Test Documents 3	2	2017	2	2017
Standardization Agreements/Proof of Inspection Test Documents 4	3	2017	3	2017
Ammunition Test and Technology Team of Experts Meeting 3	1	2018	1	2018
Standardization Agreements/Proof of Inspection Test Documents 5	2	2018	2	2018
Standardization Agreements/Proof of Inspection Test Documents 6	3	2018	3	2018
Ammunition Test and Technology Team of Experts Meeting 4	1	2019	1	2019
Standardization Agreements/Proof of Inspection Test Documents 7	2	2019	2	2019
Standardization Agreements/Proof of Inspection Test Documents 8	3	2019	3	2019
Ammunition Test and Technology Team of Experts Meeting 5	1	2020	1	2020
Standardization Agreements/Proof of Inspection Test Documents 9	2	2020	2	2020
Standardization Agreements/Proof of Inspection Test Documents 10	3	2020	3	2020