Department of Defense
Fiscal Year (FY) 2018 Budget Estimates

May 2017

Operational Test and Evaluation, Defense

Defense-Wide Justification Book Volume 5 of 5

Operational Test and Evaluation, Defense

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Department of Defense
FY 2018 President's Budget Request
Exhibit R-1 FY 2018 President's Budget Request
Total Obligational Authority
(Dollars in Thousands)

09 May 2017

Appropriation	FY 2016 Base + OCO	FY 2017 PB Request with CR Adj Base	FY 2017 Total PB Requests* with CR Adj Base	FY 2017 PB Request with CR Adj OCO	FY 2017 Total PB Requests* with CR Adj OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj OCO
Operational Test & Eval, Defense	187,483	187,127	189,852				
Total Research, Development, Test & Evaluation	187,483	187,127	189,852				

R-1C1F: FY 2018 President's Budget Request (Published Version), as of May 9, 2017 at 16:27:03

Department of Defense
FY 2018 President's Budget Request
Exhibit R-1 FY 2018 President's Budget Request
Total Obligational Authority
(Dollars in Thousands)

09 May 2017

Appropriation	FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA	FY 2017 Total PB Requests* with CR Adj Base + OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj Base + OCO	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Operational Test & Eval, Defense	187,127	189,852		189,852	210,900		210,900
Total Research, Development, Test & Evaluation	187,127	189,852		189,852	210,900		210,900

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Department of Defense
FY 2018 President's Budget Request
Exhibit R-1 FY 2018 President's Budget Request
Total Obligational Authority
(Dollars in Thousands)

09 May 2017

Summary Recap of Budget Activities	FY 2016 Base + OCO	FY 2017 PB Request with CR Adj Base	FY 2017 Total PB Requests* with CR Adj Base	FY 2017 PB Request with CR Adj OCO	FY 2017 Total PB Requests* with CR Adj OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj OCO
Management Support	187,483	178,994	181,719				
Undistributed		8,133	8,133				
Total Research, Development, Test & Evaluation	187,483	187,127	189,852				
Summary Recap of FYDP Programs							
Research and Development	187,483	178,994	181,719				
Administration and Associated Activities		8,133	8,133				
Total Research, Development, Test & Evaluation	187,483	187,127	189,852				

Department of Defense
FY 2018 President's Budget Request
Exhibit R-1 FY 2018 President's Budget Request
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(Dollars in Thousands)

09 May 2017

Summary Recap of Budget Activities	FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA	FY 2017 Total PB Requests* with CR Adj Base + OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj Base + OCO	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Management Support	178,994	181,719		181,719	210,900		210,900
Undistributed	8,133	8,133		8,133			
Total Research, Development, Test & Evaluation	187,127	189,852		189,852	210,900		210,900

Summary Recap of FYDP Programs							
Research and Development	178,994	181,719		181,719	210,900		210,900
Administration and Associated Activities	8,133	8,133		8,133			
Total Research, Development, Test & Evaluation	187,127	189,852		189,852	210,900		210,900

Defense-Wide
FY 2018 President's Budget Request
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(Dollars in Thousands)

09 May 2017

Summary Recap of Budget Activities	FY 2016 Base + OCO	FY 2017 PB Request with CR Adj Base	FY 2017 Total PB Requests* with CR Adj Base	FY 2017 PB Request with CR Adj OCO	FY 2017 Total PB Requests* with CR Adj OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj OCO
Management Support	187,483	178,994	181,719				
Undistributed		8,133	8,133				
Total Research, Development, Test & Evaluation	187,483	187,127	189,852				
Summary Recap of FYDP Programs							
Research and Development	187,483	178,994	181,719				
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Total Research, Development, Test & Evaluation	187,483	187,127	189,852				

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09 May 2017

Summary Recap of Budget Activities	FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA	FY 2017 Total PB Requests* with CR Adj Base + OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj Base + OCO	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Management Support	178,994	181,719		181,719	210,900		210,900
Undistributed	8,133	8,133		8,133			
Total Research, Development, Test & Evaluation	187,127	189,852		189,852	210,900		210,900
Summary Recap of FYDP Programs							
Research and Development	178,994	181,719		181,719	210,900		210,900
Administration and Associated Activities	8,133	8,133		8,133			
Total Research, Development, Test & Evaluation	187,127	189,852		189,852	210,900		210,900

Defense-Wide
FY 2018 President's Budget Request
Exhibit R-1 FY 2018 President's Budget Request
Total Obligational Authority
(Dollars in Thousands)

09 May 2017

Appropriation: 0460D Operational Test & Eval, Defense

Line No	Program Element Number	Item	Act	FY 2016 Base + OCO	FY 2017 PB Request with CR Adj Base	FY 2017 Total PB Requests* with CR Adj Base	FY 2017 PB Request with CR Adj OCO	FY 2017 Total PB Requests* with CR Adj OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj OCO	Sec
1	0605118OTE	Operational Test and Evaluation	06	76,838	78,047	80,772					U
2	0605131OTE	Live Fire Test and Evaluation	06	46,882	48,316	48,316					U
3	0605814OTE	Operational Test Activities and Analyses	06	63,763	52,631	52,631					U
		Management Support		187,483	178,994	181,719					
4	0901560OTE	Continuing Resolution Programs	20		8,133	8,133					U
		Undistributed			8,133	8,133					
Total Operational Test & Eval, Defense				187,483	187,127	189,852					

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Defense-Wide
FY 2018 President's Budget Request
Exhibit R-1 FY 2018 President's Budget Request
Total Obligational Authority
(Dollars in Thousands)

09 May 2017

Appropriation: 0460D Operational Test & Eval, Defense

Line No	Program Element Number	Item	Act	FY 2017 Total PB Requests** with CR Adj Base+OCO+SAA	FY 2017 Total PB Requests* with CR Adj Base + OCO	FY 2017 Less Enacted Div B P.L.114-254** OCO	FY 2017 Remaining Req with CR Adj Base + OCO	FY 2018 Base	FY 2018 OCO	FY 2018 Total	Sec
1	0605118OTE	Operational Test and Evaluation	06	78,047	80,772		80,772	83,503		83,503	U
2	0605131OTE	Live Fire Test and Evaluation	06	48,316	48,316		48,316	59,500		59,500	U
3	0605814OTE	Operational Test Activities and Analyses	06	52,631	52,631		52,631	67,897		67,897	U
		Management Support		178,994	181,719		181,719	210,900		210,900	
4	0901560OTE	Continuing Resolution Programs	20	8,133	8,133		8,133				U
		Undistributed		8,133	8,133		8,133				
Total Operational Test & Eval, Defense				187,127	189,852		189,852	210,900		210,900	

R-1C1F: FY 2018 President's Budget Request (Published Version), as of May 9, 2017 at 16:27:03

Program Element Table of Contents (by Budget Activity then Line Item Number)

Appropriation 0460: Operational Test and Evaluation, Defense

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Program Element Table of Contents (Alphabetically by Program Element Title)

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Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Operational Test and Evaluation, Defense	Date: May 2017
Appropriation/Budget Activity 0460: *Operational Test and Evaluation, Defense* / BA 6: *RDT&E Management Support*	**R-1 Program Element (Number/Name)** PE 0605118OTE / *Operational Test and Evaluation (OT&E)*

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	90.673	76.838	80.772	83.503	-	83.503	85.397	86.803	88.620	90.499	Continuing	Continuing
0605118OTE: *OT&E*	90.673	76.838	80.772	83.503	-	83.503	85.397	86.803	88.620	90.499	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Director of Operational Test and Evaluation (DOT&E) was created by Congress in 1983. The Director is responsible under Title 10 for policy and procedures for all aspects of Operational Test and Evaluation (OT&E) within the Department of Defense (DoD). Particular focus is given to OT&E that supports major weapon system production decisions for acquisition programs included on the Office of Secretary of Defense Test and Evaluation Oversight List that is prepared and approved annually. Generally, there are about 300 programs on the oversight list including all Major Defense Acquisition Programs (MDAP) and Major Automated Information Systems (MAIS). MDAPs may not proceed beyond low-rate initial production (BLRIP) until OT&E of the program is complete. DOT&E is involved early in the planning phase of each program to ensure adequate testing is planned and executed. Key elements of DOT&E's oversight authority include:

- Approve component Test and Evaluation Master Plans (TEMPS).
- Approve component OT&E Test Plans (TPs).
- Oversee Military Department preparation and conduct of field operational tests; analysis and evaluation of the resultant test data; the assessment of the adequacy of the executed test and evaluation programs; and assessment of the operational effectiveness and suitability of the weapon systems.
- Report results of OT&E that supports BLRIP decisions to the Secretary of Defense and Congress, as well as providing an annual report summarizing all OT&E activities and the adequacy of test resources within DoD during the previous fiscal year.
- Review and make recommendations to the Secretary of Defense on all budgetary and financial matters related to OT&E, including operational test facilities, resources and ranges.

DOT&E also oversees and resources OT&E community efforts to plan and execute joint operational evaluations of information assurance and interoperability (IA and IOP) of fielded systems and networks during major Combatant Command (CCMD) and Service exercises, and reports the trends and findings in the annual report.

DOT&E is also involved in increasing the capacity to access realistically advanced cyber warfare capabilities to keep pace with heightened demand for their capabilities, advancing technologies and the growing cyber threat.

This Program Element includes funds to obtain Federally Funded Research and Development Center (FFRDC) support in performing the described tasks, travel funds to carry out oversight of the OT&E and IA and IOP programs, funds for Service teams performing information assurance and interoperability assessments during exercises, administrative support services, DFAS support, and engineering and technical support services related to the conduct of operational test and evaluation and exercise assessments.

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Operational Test and Evaluation, Defense	Date: May 2017
Appropriation/Budget Activity 0460: *Operational Test and Evaluation, Defense* / BA 6: *RDT&E Management Support*	**R-1 Program Element (Number/Name)** PE 0605118OTE / *Operational Test and Evaluation (OT&E)*

B. Program Change Summary ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	76.838	78.047	80.129	-	80.129
Current President's Budget	76.838	80.772	83.503	-	83.503
Total Adjustments	0.000	2.725	3.374	-	3.374
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program increases for Cyber Testing	-	-	3.374	-	3.374
• Cybersecurity Assessments	-	2.725	-	-	-

Change Summary Explanation

AMENDED BUDGET REQUEST JUSTIFICATION: $2.725 million is required to address emergency warfighting readiness requirements
This increase is for Cybersecurity Assessments including funding three commercially available exploits to help DoD Red Teams portray Tier 3 cyber adversaries; funding and configuring three Cross Domain Solutions (CDS) for cybersecurity testing to identify vulnerabilities in fielded systems and acquisition programs, identify mitigation strategies, and promulgate efficient test guidance; deploying a new platform to improve situational awareness and control of five DoD Red Teams.

$3.374 million in FY 2018 is to develop testing standards, policies, and practices for cyber payloads.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Operational Test and Evaluation, Defense			Date: May 2017
Appropriation/Budget Activity 0460 / 6	R-1 Program Element (Number/Name) PE 0605118OTE / *Operational Test and Evaluation (OT&E)*	Project (Number/Name) 0605118OTE / *OT&E*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
0605118OTE: *OT&E*	90.673	76.838	80.772	83.503	-	83.503	85.397	86.803	88.620	90.499	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Director of Operational Test and Evaluation (DOT&E) was created by Congress in 1983. The Director is responsible under Title 10 for policy and procedures for all aspects of Operational Test and Evaluation (OT&E) within the Department of Defense (DoD). Particular focus is given to OT&E that supports major weapon system production decisions for acquisition programs included on the Office of Secretary of Defense Test and Evaluation Oversight List that is prepared and approved annually. Generally, there are about 300 programs on the oversight list including all Major Defense Acquisition Programs (MDAP) and Major Automated Information Systems (MAIS). MDAPs may not proceed beyond low-rate initial production (BLRIP) until OT&E of the program is complete. DOT&E is involved early in the planning phase of each program to ensure adequate testing is planned and executed. Key elements of DOT&E's oversight authority include:

- The approval of component Test and Evaluation Master Plans (TEMPS).
- The approval of component OT&E Test Plans (TPs).
- Oversight of Military Department preparation and conduct of field operational tests; analysis and evaluation of the resultant test data; the assessment of the adequacy of the executed test and evaluation programs; and assessment of the operational effectiveness and suitability of the weapon systems.
- Reporting results of OT&E that support BLRIP decisions to the Secretary of Defense and Congress, as well as providing an annual report summarizing all OT&E activities and the adequacy of test resources within DoD during the previous fiscal year.
- The review and make recommendations to the Secretary of Defense on all budgetary and financial matters related to OT&E, including operational test facilities, resources and ranges.

DOT&E also oversees and resources OT&E community efforts to plan and execute joint operational evaluations of information assurance and interoperability (IA and IOP) of fielded systems and networks during major Combatant Command (CCMD) and Service exercises, and reports the trends and findings in the annual report.

DOT&E is also involved in increasing the capacity to access realistically advanced cyber warfighting capabilities to keep pace with heightened demand for those capabilities, advancing technologies and the growing cyber threat.

This Program Element includes funds to obtain Federally Funded Research and Development Center (FFRDC) support in performing the described tasks, travel funds to carry out oversight of the OT&E and IA and IOP programs, funds for Service teams performing information assurance and interoperability assessments during exercises, administrative support services, DFAS support, and engineering and technical support services related to the conduct of operational test and evaluation and exercise assessments.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Operational Test and Evaluation, Defense		Date: May 2017
Appropriation/Budget Activity 0460 / 6	**R-1 Program Element (Number/Name)** PE 0605118OTE / *Operational Test and Evaluation (OT&E)*	**Project (Number/Name)** 0605118OTE / *OT&E*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
Title: Operational Test and Evaluation	76.838	80.772	83.503

FY 2016 Accomplishments:
Operational Test and Evaluation Oversight

This effort is in direct support of the Director's Title 10 responsibilities and is a continuing effort. Funding for FY 2016 provides Operational Test and Evaluation inputs for Test and Evaluation Master Plans, Test Plans, System Acquisition Reports, Defense Acquisition Executive Summary Reports for those programs designated for oversight by DOT&E and OUSD(AT&L). Key elements of DOT&E oversight authority are identified in Calendar Year 2016 Office of the Secretary of Defense Test and Evaluation Oversight List.

Cybersecurity Evaluations

DOT&E sponsored seven Combatant Command (CCMD) and two Service cybersecurity exercise assessments in FY 2016. In addition to the nine exercise assessments, DOT&E performed two assessments during visits to operational sites not involved in an exercise. All DOT&E-sponsored assessments included a "fix" phase during which DOT&E-funded cybersecurity experts helped CCMD and Service personnel address critical cybersecurity vulnerabilities. As part of our new Cyber Readiness Campaigns (CRCs), DOT&E worked with U.S. Pacific Command, U.S. Northern Command, U.S. Strategic Command, U.S. European Command, and U.S. Southern Command to evaluate a larger spectrum of cybersecurity related issues than is possible during a short exercise. The CRCs included more frequent and focused assessment events, and they helped commands address persistent, mission-critical cybersecurity vulnerabilities. To enable more threat-representative and longer-duration adversary portrayal, DOT&E initiated a Persistent Cyber Opposing Force (PCO) capability as part of U.S. Pacific Command's CRC as well as at U.S. Northern Command. DOT&E worked with U.S. Cyber Command to expand the use of PCOs to better understand and address our network vulnerabilities, to be more threat representative, and to allow more efficient use of limited cyber red team assets. To support cybersecurity assessments of live DoD networks, DOT&E conducted lab-based cyber testing of cross-domain solutions (CDSs) and programmable logic controllers (PLCs). These are critical components in many DoD systems and networks, and DOT&E's testing resulted in recommendations to improve CDS and PLC security and test procedures. Using personnel with advanced cybersecurity expertise, DOT&E conducted evaluations of a small number of offensive cyber capabilities in direct support of the capabilities' sponsor. DOT&E transmitted critical findings to DoD leadership along with recommended actions to improve DoD's cybersecurity posture. DOT&E's FY 2016 cybersecurity evaluations included trend analyses across prior year results, both within and across CCMDs.

FY 2017 Plans:
Operational Test and Evaluation Oversight

Exhibit R-2A, RDT&E Project Justification: FY 2018 Operational Test and Evaluation, Defense		Date: May 2017
Appropriation/Budget Activity 0460 / 6	**R-1 Program Element (Number/Name)** PE 0605118OTE / *Operational Test and Evaluation (OT&E)*	**Project (Number/Name)** 0605118OTE / *OT&E*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
This effort is in direct support of the Director's Title 10 responsibilities and is a continuing effort. Funding for FY 2017 provides Operational Test and Evaluation inputs for Test and Evaluation Master Plans, Test Plans, System Acquisition Reports, Defense Acquisition Executive Summary Reports for those programs designated for oversight by DOT&E and OUSD(AT&L). Key elements of DOT&E oversight authority are identified in Calendar Year 2017 Office of the Secretary of Defense Test and Evaluation Oversight List. Cybersecurity Evaluations DOT&E plans to sponsor approximately 10 CCMD and Service cybersecurity assessments and CRCs in FY 2017, each including a "fix" phase as described above. DOT&E plans to continue working with the CCMDs and Services to develop multi-year plans for exercise cyber assessments and CRC events. These plans will focus on assessing the CCMD or Service's ability to complete missions in a contested cyber environment. To support threat-representative assessments, and to enable continuous improvement of DoD's cybersecurity posture, DOT&E will continue to work with U.S. Cyber Command to establish a PCO capability for all CCMDs and Services. Primary objectives for DOT&E's assessments in FY 2017 include the portrayal of advanced nation-state cyber threats and the assessment of operational missions during realistic cyber attacks. DOT&E will assess Cyber Protection Teams when they participate during PCO, CRC or exercise events. DOT&E will continue to develop techniques to efficiently and effectively assess offensive cyber capabilities, and conduct timely evaluations of these capabilities. DOT&E will use the DoD Enterprise Cyber Range Environment (DECRE) and other lab and cyber range assets to support events, for added threat realism. DOT&E will transmit critical findings to DoD leadership along with recommended actions to improve DoD's cybersecurity posture. FY 2017 evaluations will include trend analyses across prior year results, both within and across CCMDs.			
FY 2018 Plans: Operational Test and Evaluation Oversight This effort is in direct support of the Director's Title 10 responsibilities and is a continuing effort. Funding for FY 2018 provides Operational Test and Evaluation inputs for Test and Evaluation Master Plans, Test Plans, System Acquisition Reports, Defense Acquisition Executive Summary Reports for those programs designated for oversight by DOT&E and OUSD(AT&L). Key elements of DOT&E oversight authority are identified in Calendar Year 2018 Office of the Secretary of Defense Test and Evaluation Oversight List. Cybersecurity Evaluations			

Exhibit R-2A, RDT&E Project Justification: FY 2018 Operational Test and Evaluation, Defense		Date: May 2017
Appropriation/Budget Activity 0460 / 6	**R-1 Program Element (Number/Name)** PE 0605118OTE / *Operational Test and Evaluation (OT&E)*	**Project (Number/Name)** 0605118OTE / *OT&E*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
DOT&E will oversee and resource approximately 10 CCMD and Service assessments in FY 2018, each including a "fix" phase. Pending CCMD and Service agreement, DOT&E plans to conduct CRC events with all of the CCMDs and Services. Each CRC will include frequent assessments focused on new cybersecurity technologies or procedures to address problems identified in prior assessments. CRCs will culminate in a capstone event during a major exercise that evaluates the cybersecurity of critical missions, as improved by the new technologies and procedures. Using the PCO, DOT&E will continue to work with the CCMDs and cyber red teams to increase the portrayal of advanced nation-state cyber threats. The goal is to have the majority of assessments in FY 2018 include advanced threats that stress critical missions. DOT&E will assess Cyber Protection Teams when they participate during PCO, CRC or exercise events. DOT&E will continue to develop techniques to efficiently and effectively assess offensive cyber capabilities, and conduct timely evaluations of these capabilities. DOT&E will use the DoD Enterprise Cyber Range Environment (DECRE) and other lab and cyber range assets to support events, for added threat realism. DOT&E will transmit critical findings to DoD leadership along with recommended actions to improve DoD's cybersecurity posture. FY 2018 evaluations will include trend analyses across prior year results, both within and across CCMDs and Services. In FY 2018 DOT&E will develop testing standards, policies, and practices for cyber payloads.			
Accomplishments/Planned Programs Subtotals	76.838	80.772	83.503

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

Performance Measure: Percentage of required operational test planning documents, assessments, and reports applicable to acquisition programs on the OSD Test and Evaluation Oversight List and other special interest programs/legacy systems that are completed and delivered to the appropriate decision makers on time.
The on-time completion rate was computed on the basis of the number of required products that were submitted within established time standards relative to the total number of such products that fell due during the fiscal year. Products included in the measure include beyond low-rate initial production reports, Test Plans, and Test and Evaluation Master Plans for operational test and evaluation oversight as well as assessment plans, "quick look" reports, and final reports for the information assurance and interoperability testing associated with scheduled test events.

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Operational Test and Evaluation, Defense	Date: May 2017
Appropriation/Budget Activity 0460: *Operational Test and Evaluation, Defense* / BA 6: *RDT&E Management Support*	**R-1 Program Element (Number/Name)** PE 0605131OTE / *Live Fire Test and Evaluation (LFT&E)*

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	47.776	46.882	48.316	59.500	-	59.500	56.962	56.390	59.362	57.370	Continuing	Continuing
0605131OTE: *LFT&E*	47.776	46.882	48.316	59.500	-	59.500	56.962	56.390	59.362	57.370	Continuing	Continuing

A. Mission Description and Budget Item Justification

This Program Element consists of three programs: Live Fire Test and Evaluation, Joint Aircraft Survivability Program (JASP), and Joint Technical Coordinating Group for Munitions Effectiveness (JTCG/ME).

This Program Element directly supports the Congressional statutory requirements for oversight of Live Fire Test and Evaluation (LFT&E). The primary objective of LFT&E is to assure that the vulnerability and survivability of Department of Defense (DoD) crew-carrying platforms and the lethality of our conventional munitions are known and acceptable before entering full-rate production. LFT&E encompasses realistic tests involving actual United States (U.S.) and foreign threat hardware or, if not available, acceptable surrogate threat hardware. The objective is to identify and correct design deficiencies early in the development process. A completed LFT&E program and test report is required before programs proceed beyond low-rate initial production (BLRIP). LFT&E also includes realistic modeling and simulation (M&S) to examine survivability and lethality attributes not assessed during testing.

This Program Element also supports DoD's Joint Live Fire (JLF) Program and other LFT&E related initiatives. JLF was begun in 1984 under an Office of the Secretary of Defense charter to test fielded front-line combat aircraft and armor systems for their vulnerabilities as well as fielded weapons, both U.S. and foreign, for their lethality against their respective targets. Funds are also used to support other initiatives related to quick reaction requests from theater and other areas of personnel survivability.

The Joint Aircraft Survivability Program is the DoD's focal point for joint service enhancement of military aircraft non-nuclear survivability. The JASP is chartered by the commanders of the USN Naval Air Systems Command, USA Aviation and Missile Command and USAF Life Cycle Management Center to coordinate and conduct RDT&E to improve military aircraft survivability, develop and standardize aircraft survivability modeling and simulation (M&S), facilitate information exchange on aircraft survivability and support aircraft survivability education for the DoD and U.S. aircraft community. Each chartering command provides a senior aircraft survivability expert for the JASP Principal Members Steering Group (PMSG), which guides the program and approves projects for funding. The JASP assesses and reports on combat damage incidents through the Joint Combat Assessment Team (JCAT), is the Executive Agent for the Joint Live Fire Aircraft Systems Program managed by the Live Fire Test office of DOT&E.

The Joint Logistics Commanders Joint Technical Coordinating Group for Munitions Effectiveness (JTCG/ME) was chartered more than 40 years ago to serve as DoD's focal point for munitions effectiveness information. This has taken the form of widely used Joint Munitions Effectiveness Manuals (JMEMs) which address all major non-nuclear U.S. weapons. JTCG/ME authenticates weapons effectiveness data for use in training, systems acquisition, weapon procurement, and combat modeling and simulation. JMEMs are used by the Armed Forces of the U.S., NATO, and other allies to plan operational missions, support training and tactics development, and support force-level analyses. JTCG/ME also develops and standardizes methodologies for evaluation of munitions effectiveness and maintains databases for target vulnerability, munitions lethality, and weapon system accuracy. The JMEM requirements and development processes continues to be driven by operational lessons

learned (Enduring Freedom, Iraqi Freedom, Odyssey Dawn and Inherent Resolve) and the needs of Combatant Commands, Services, Military Targeting Committee, and Operational Users Working Groups input for specific weapon-target pairings and methodologies.

This program element also includes funds to obtain Federally Funded Research and Development Center (FFRDC) expertise in performing analyses in support of described Live Fire Test and Evaluation tasks, as well as travel funds to carry out the LFT&E, JASP and JTCG/ME programs.

B. Program Change Summary ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	46.882	48.316	48.966	-	48.966
Current President's Budget	46.882	48.316	59.500	-	59.500
Total Adjustments	0.000	0.000	10.534	-	10.534
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	0.000	-			
• SBIR/STTR Transfer	-	-			
• Program increases for Enhanced Collateral Damage Methodology	-	-	4.534	-	4.534
• Program increases for Enhanced Laser Weaponeering Methodologies and Joint Munition Effectiveness Manual (JMEM) Development	-	-	6.000	-	6.000

Change Summary Explanation

$4.534 million is to fund collateral damage estimation methodology improvements for buried ordinance characterization and Area of Responsibility (AoR) specific building debris.

$6.000 million is to fund generation of preliminary data and analysis of selected Directed Energy Laser Weapons Systems (DWS) characteristics, to include their delivery accuracy, reliability, and damage effects on the targets of interest. Costs will include required component laboratory and field tests as well as advances to relevant modeling and simulation to set a more sustainable protocol for DEW JMEM database development and to have an ability to assess a wider spectrum of weapon-target pairings. It will also establish and guide the selection of DWS target pairing procedures based on potential engagement scenarios, collateral damage estimation, and other considerations.

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COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
0605131OTE: *LFT&E*	47.776	46.882	48.316	59.500	-	59.500	56.962	56.390	59.362	57.370	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This Program Element consists of three programs: Live Fire Test and Evaluation, Joint Aircraft Survivability Program (JASP) and Joint Technical Coordinating Group for Munitions Effectiveness (JTCG/ME).

This Program Element directly supports the Congressional statutory requirements for oversight of Live Fire Test and Evaluation (LFT&E). The primary objective of LFT&E is to assure that the vulnerability and survivability of Department of Defense (DoD) crew-carrying platforms and the lethality of our conventional munitions are known and acceptable before entering full-rate production. LFT&E encompasses realistic tests involving actual United States (U.S.) and foreign threat hardware or, if not available, acceptable surrogate threat hardware. The objective is to identify and correct design deficiencies early in the development process. A completed LFT&E program and test report is required before programs proceed beyond low-rate initial production (BLRIP). LFT&E also includes realistic modeling and simulation (M&S) to examine survivability and lethality attributes not assessed during testing.

This Program Element also supports DoD's Joint Live Fire (JLF) Program and other LFT&E related initiatives. JLF was begun in 1984 under an Office of the Secretary of Defense (OSD) charter to test fielded front-line combat aircraft and armor systems for their vulnerabilities as well as fielded weapons, both U.S. and foreign, for their lethality against their respective targets. Funds are also used to support other initiatives related to quick reaction requests from theater and other areas of personnel survivability.

The Joint Aircraft Survivability Program is the DoD's focal point for joint service enhancement of military aircraft non-nuclear survivability. The JASP is chartered by the commanders of the USN Naval Air Systems Command, USA Aviation and Missile Command and USAF Life Cycle Management Center to coordinate and conduct RDT&E to improve military aircraft survivability, develop and standardize aircraft survivability modeling and simulation (M&S), facilitate information exchange on aircraft survivability and support aircraft survivability education for the DoD and U.S. aircraft community. Each chartering command provides a senior aircraft survivability expert for the JASP Principal Members Steering Group (PMSG), which guides the program and approves projects for funding. The JASP assesses and reports on combat damage incidents through the Joint Combat Assessment Team (JCAT), is the Executive Agent for the Joint Live Fire Aircraft Systems Program managed by the Live Fire Test office of DOT&E.

The Joint Logistics Commanders' Joint Technical Coordinating Group for Munitions Effectiveness (JTCG/ME) was chartered more than 40 years ago to serve as DoD's focal point for munitions effectiveness information. This has taken the form of widely used Joint Munitions Effectiveness Manuals (JMEMs) which address all major non-nuclear U.S. weapons. JTCG/ME authenticates weapons effectiveness data for use in training, systems acquisition, weapon procurement, and combat modeling and simulation. JMEMs are used by the Armed Forces of the U.S., NATO, and other allies to plan operational missions, support training and tactics development, and support force-level analyses. JTCG/ME also develops and standardizes methodologies for evaluation of munitions effectiveness and maintains databases for target vulnerability, munitions lethality, and weapon system accuracy. The JMEM requirements and development processes continues to be driven by operational lessons

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learned (Enduring Freedom, Iraqi Freedom, Odyssey Dawn and Inherent Resolve) and the needs of Combatant Commands (CCMDs), Services, Military Targeting Committee, and Operational Users Working Groups (OUWG) input for specific weapon-target pairings and methodologies.

This program element also includes funds to obtain Federally Funded Research and Development Center (FFRDC) expertise in performing analyses in support of described Live Fire Test and Evaluation tasks, as well as travel funds to carry out the LFT&E, JASP and JTCG/ME programs.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
Title: Live Fire Test and Evaluation	46.882	48.316	59.500
FY 2016 Accomplishments: Live Fire Test and Evaluation Major Test and Evaluation Programs The FY 2016 budget supported Live Fire Test and Evaluation deputate's assessment of Test and Evaluation Master Plans, Test Plans, System Acquisition Reports, Defense Acquisition Executive Summary reports, and the development of Live Fire Test and Evaluation reports for those programs designated for OSD oversight. The DOT&E oversight list contains 132 programs on live fire oversight; it is maintained continuously and published annually. JLF Programs and LFT&E Initiatives In FY16, JLF funded 27 projects and delivered 21 reports. Focus areas for JLF included projects that either 1) characterized new survivability issues; 2) characterized new lethality issues; 3) improved accuracy and fidelity of weapon data; 4) improved test methods; or 5) improved modeling and simulation methods. JLF Air projects evaluated a range of contemporary vulnerability issues. Projects investigated the ballistic vulnerability of (1) rotorcraft with auxiliary fuel tanks inside the cabin; and (2) C-12 fuel subsystem ullage reactions. Another project evaluated the effectiveness of the CV-22 Wing Fire Protection System during various modes of fuel transfer. In addition, the effectiveness of ultra-high-molecular-weight polyethylene armor installed in CV-22 cabins (due to emerging threats encountered on the battlefield) was addressed by one project. Other projects improved modeling and simulation tools by collecting aircraft system-level damage effects data for medium-class missile warheads against fixed-wing aircraft, as well as a project to determine the vulnerability to yawed armor-piercing and armor-piercing incendiary projectiles. Finally, JLF Air projects assessed vulnerability to foreign threats such as the OG-7V fragmentation grenade as well as MANPADS. JLF Ground projects pursued a variety of lethality and survivability research objectives. One project characterized the complete fragmentation description data for an MK84 bomb. Other efforts quantified collateral damage effects from Hellfire and MK82 warheads, developed better methods to characterize blast debris for collateral damage assessments, and measured the effect of bomb burial on collateral damage. Other projects modeled the behind-armor debris of ground vehicle kinetic energy penetrators			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
as well as anti-tank mines, and an underbody blast vulnerability assessment of the JLTV was conducted. JLF Ground projects sought to develop materials to better evaluate body armor as well as evaluate various materials used in combat eye protection. JLF Ground conducted modeling to determine a more lethal mix of 30 mm ammunition combinations. Finally, JLF Ground pursued efforts to enhance test & evaluation methodology such as improved methods of collecting arena test data. JLF Sea projects provided various vulnerability results. One JLF Sea project conducted deep depth underwater explosion testing against a model surrogate to improve submarine vulnerability assessments. Another project collected test data of underwater explosion bubble jetting in order to improve modeling and simulation tools. Finally, another project developed ballistic mannequins that provide for real-time assessment of rapid incapacitation. JLF continued to support the development of a ground vehicle survivability educational program, including a 3-day short course and the development of formal course notes and a textbook. Joint Aircraft Survivability Program (JASP) In FY 2016 the JASP continued work on 37 multi-year RDT&E projects and initiated 18 new projects approved by the JASP Principal Members Steering Group and OSD/DOT&E. In the area of susceptibility reduction, the JASP addressed improving the effectiveness and reducing the space, weight and power required for directed energy infrared countermeasures, electronic countermeasures technology and techniques, integrated aircraft survivability equipment, and aircrew situational awareness. In the area of vulnerability reduction, the JASP continued to address requirements for lighter and more effective vulnerability reduction technology (e.g., armor, fuel containment, fire suppression, and aircrew and passenger protection). In aircraft survivability Modeling and Simulation (M&S), the JASP continued to improve survivability M&S credibility, address operator requirements for survivability data, integrate DIA threat missile models into threat engagement codes, improve the assessment of aircrew and passenger injuries, and address M&S requirements identified by the joint aircraft survivability community. The JASP completed 27 reports documenting efforts accomplished in FY 2016. The JCAT continued to support the Air Force, Army, Marine Corps and Navy by assessing combat damage incidents, training operators on threat effects and combat damage assessment, and reporting their findings to combatant commanders and the DoD science and technology and acquisition communities. The JASP continued supporting aircraft survivability education and information exchange through internet sites (restricted access and classified), by publishing the Aircraft Survivability Journal, developing educational materials and conducting training for the DoD and their contractors. Joint Technical Coordinating Group for Munitions Effectiveness			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
JTCG/ME continued to field critical JMEM products to enable on-going Combatant Command (CCMD) operational Weaponeering and collateral damage estimates, along with support to the Anti-air effectiveness community (operational, training, testing, and analysis). In FY16, JTCG/ME continued to develop and standardize methodologies for evaluating munitions effectiveness, including target vulnerability characterization, munitions lethality, weapon system accuracy, and specific weapon-target pairings driven primarily from current operational lessons learned, Joint Staff Data Calls, and Combatant Commands' needs. JTCG/ME deployed and continued enhancement of future versions of its two major JTCG/ME Joint Munitions Effectiveness Manual (JMEM) products, the JMEM Weaponeering System (JWS) and Joint Antiair Combat Effectiveness (J-ACE). The JTCG/ME also continued coordination and development of a non-kinetic JMEM capability, to include a prototype Cyber JMEM. Beyond traditional JMEM products, JTCG/ME developed and supplied specialized weaponeering data and solutions for Warfighter requirements. This includes the Digital Precision Strike Suite (DPSS) Collateral Damage Estimation (DCiDE) tool and Digital Imagery Exploitation Engine (DIEE), as well as standalone resources such as the Probability of kill (Pk) Lookup Tools, Collateral Damage Estimation (CDE) tables, and munitions weaponeering guides. JWS is the DoD wide source for air-to-surface (AS) and surface-to-surface (SS) weaponeering, munitions, and target information used daily in the U.S. Central Command (USCENTCOM), U.S. Special Operations Command (USSOCOM), and U.S. Africa Command (USAFRICOM) in the deliberate planning process directly supporting Joint Publication 3-60 "Joint Targeting". JWS enables Combatant Commands to efficiently prosecute their target sets. JWS incorporates accredited methodologies, certified munition characteristics, delivery accuracy, target vulnerability data, and numerous user aids to support the operational use of JWS to predict weapons effectiveness for fielded weapons and delivery systems. The JTCG/ME deployed JWS v2.2 in FY16. JWS v2.2 included a total of 220 methodology, functionality, weapons/warheads/fuzes, and target updates. JWS v2.2 included initial connectivity with the Digital Precision Strike Suite (DPSS) Collateral Damage Estimation (DCiDE) Tool, as well as updates to the Fast Integrated Structural Tool (FIST) (containing building types and a quasi-static blast capability) and other high priority User requirement updates. The connectivity with DCiDE improves both speed and throughput of data. This capability enabled the Combatant Commands to have operational targeting, weaponeering, and collateral damage estimation capability in direct support of operations, mission planning, and training. Additionally, Warfighters were able to put ordnance on target and as such, directly affected combat effectiveness in current operations. JTCG/ME continued to facilitate coalition interoperability in FY16, and is currently completing several JWS version releases to key coalition partners in support of current operations under Foreign Military Sales (FMS) agreements. These efforts will enable the United Kingdom, Canada, Australia, Republic of Korea, and other coalition partners to plan operational weaponeering and			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
collateral damage estimates, support training and tactics development, and support force-level analyses. This capability is critical to the effectiveness of U.S. targeting and fires personnel working in combined environments. JTCG/ME finalized integration, performed operational testing, and progressed to final systems verification for JWS v2.3 in FY16, with Risk Mitigation Framework testing and release scheduled for FY17. JWS v2.3 will include enhanced data sets and capabilities with focus on connectivity to other targeting and mission planning capabilities for improved estimates and more seamless planning. Specifically, JWS v2.3 will include new/updated data sets, new Imagery Interface to implement aimpoint development leveraging the Tasked Target Text Data (T3D) data format implemented by currently fielded mission planning systems. JWS software and T3D imagery interface modifications to support integration of Electronic Light Table (ELT) viewers. There will also be a Modernized Integrated Database (MIDB) and Joint Targeting Toolbox (JTT) interface with additional capabilities to support connectivity. These developments will enable the integration of Weaponeering, Precision Point Mensuration (PPM) and Collateral Damage Estimation (CDE) via Digital Imagery Exploitation Engine (DIEE). JWS v2.3 will also add the updated Gunship Delivery Accuracy Program (GDAP), Rotary Wing Delivery Accuracy Program (RWDAP), and Fast Integrated Structural Tool (FIST) v2.0. JTCG/ME continued to deliver data and methodology for integration and development of JWS v2.4 in FY16. Enhanced capabilities for data and connectivity will continue for JWS v2.4 during FY17. JTCG/ME began to plan and refine a future JWS architecture strategy to enable interactive scene base weaponeering, maximize re-use and interoperability of capabilities, increase speed of modeling and simulation, support future hardware/software compatibility, and support allied releasability. A key to this strategy is a JWS v3.x prototyping effort initiated in FY16, which will continue in FY17. The JTCG/ME released Digital Precision Strike Suite (DPSS) Collateral Damage Estimation (DCiDE) tool version v1.2.3 in FY16 to support the Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 3160.01B – “No-Strike and the Collateral Damage Estimation (CDE) Methodology”. The DCiDE tool is critical to the Warfighters’ ability to meet Urgent Operational Needs for an accredited automated CDE tool that both expedites and simplifies the CDE process. DCiDE is the only automated CDE tool authorized for use in the USCENTCOM and USAFRICOM Areas of Operation (AORs). The JTCG/ME CDE tables are used in every planned kinetic strike in all AORs to meet Commanders intent and to minimize civilian casualties. JTCG/ME updated the accredited Collateral Effect Radii (CER) Reference Tables for selected AS/SS weapons, which are the basic data that supports the CDE methodology. Changes included additions for airburst munitions, nomenclature changes, and additional updates for newly fielded/updated systems (e.g., Hellfire family). JTCG/ME also developed and accredited the Collateral Effects Library (CEL) Tool in support of advanced CDE mitigation techniques. DOT&E received positive feedback on the use of the CER values as a critical enabler in support of munitions employment against high value targets (HVTs).			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
JTCG/ME is finalizing the Digital Imagery Exploitation Engine (DIEE) v2.0 with DPSS. DIEE will provide both seamless planning and direct linkages between JWS and mission planning systems in operational units. DIEE will combine applications that will allow targeteers and operational planners to develop more rapid strike plans, due to seamless connectivity of weaponeering, collateral damage estimation, and precision point mensuration results to mission planning systems for target execution. This new concept will integrate capabilities of an Electronic Light Table (ELT), Precision Point Mensuration tool (Common Geopositioning Services - CGS), and CDE tool (DCiDE), as well as other targeting applications in what we are calling an Integrated Display Viewer (IDV). Although DIEE is in final development, with expected fielding by beginning of FY17, several Combatant Commands have already committed to using DIEE as their primary tool for full-integrated targeteering capability. J-ACE provides authoritative air-to-air (AA) and surface-to-air (SA) weapons effectiveness information, and serves as the primary tool used by the Air Force and Navy to underpin air combat tactics, techniques, and procedures development. J-ACE is the umbrella program that includes both the Joint Anti-air Model (JAAM) and Endgame Manager (EM), which provides a full kill chain (end-to-end) capability. Other Users include National Test and Training Ranges for AA/SA shot validation and various members of the analytical community for air combat studies and planning. U.S. Strategic Command (USSTRATCOM) leverages J-ACE capabilities to support of route planning for the execution of strike packages. JAAM supports operational squadrons mission de-brief tools such as Personal Computer Debriefing System (PCDS) and several others. In FY16, JTCG/ME performed operational testing and progressed to final systems verification reviews for J-ACE v5.3, with expected Risk Mitigation Framework testing and fielding in FY17. J-ACE v5.3 will extend and update data sets for missile and aircraft target aero-performance, anti-air missile lethality, and air target vulnerability. New capabilities include the Hybrid Integration and Visualization Engine (HIVE) computer architecture interface and BLUEMAX6 (six degree of freedom aero performance) model for increased aircraft aero performance modeling with Hands-On-Stick-and-Throttle (HOTAS) and display capability allowing for actual flight control of the air craft, as well as increased counter-measure capabilities leveraging Enhanced Surface-to-Air Missile Simulation (ESAMS). J-ACE v5.3 will also include the effect of weapon system reliability on the probability of a successful engagement. The fielding of J-ACE v5.3 will allow greater aero performance options and the ability to estimate counter-measure effectiveness. A key enhancement of J-ACE v5.3 is the continued evolution of the J-ACE architecture to maximize re-use, interoperability of capabilities, support future hardware/software compatibility, and optimize integration and validation testing. JTCG/ME continued to develop, deliver, and integrate data and methodology for J-ACE v5.4, which will provide enhanced data, methodology, and descriptive material to support new weapons in the JAAM and EM. The fielding of J-ACE v5.4 in FY18 will allow for greater connectivity for outbrief capabilities by units, target detection estimation, counter Air Defense prediction capability, and enhanced architecture allowing future version growth and compatibility. J-ACE will enhance Personal Computer Debriefing System (PCDS) capability, and further evaluate enhancement of aircraft maneuverability modeling with HIVE/BLUEMAX6. In			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
addition, JAAM will include capability to evaluate two sided Suppression of Enemy Air Defense (SEAD) and Destruction of Enemy Air Defense (DEAD); improved target detection capability leveraging National Air and Space Intelligence Center (NASIC) Infrared (IR) and Radio Frequency (RF) models; and multiple ESAMS capability. The J-ACE architecture continues to be enhanced to maximize re-use, interoperability of capabilities, support future hardware/software compatibility, and optimize integration and validation testing. JTCG/ME performed requirements analysis and planning for J-ACE v5.5. J-ACE v5.5 will include rotary wing aircraft capability and further expansion of electronic warfare and counter-measure capabilities. User input through working groups and training sessions are feeding requirements generation and planning to ensure alignment with User community. In FY16, JTCG/ME continued the development of non-kinetic weaponeering tools and methodologies. Joint Non-Kinetic Effectiveness is intended to be the single source for operational Warfighters, analysts, targeteers, and planners to analyze offensive cyber capabilities, electronic attack weapons, and directed energy effectiveness. In conjunction with DOT&E and the Air Force's 363rd Intelligence, Surveillance, and Reconnaissance Group, the JTCG/ME continued development of a JMEM process for cyberspace operations, electronic attack, and directed energy. FY16 efforts centered on developing the foundational elements for JMEM production, including weapons characteristics, target vulnerability, and effects estimation tools (e.g., U.S. Cyber Command's Cyber Capabilities Registry, Electronic Warfare/Cyber Critical Elements/ Weaponeering Guides, and Directed Energy Effectiveness Lookup Tables). These efforts culminated in an initial Cyber JMEM prototype to stimulate user interaction, feedback, and maturation, while setting the foundation for a full J-NKE capability suite, to include other non-kinetic effects (e.g., directed energy). JTCG/ME will continue to refine these initial efforts in FY17, with further expanded efforts in FY18. Since JTCG/ME products are User focused and requirements driven, there is considerable effort that goes into working with Users to establish Warfighter requirements for on-going efforts and future JTCG/ME products. The Operational Users Working Group (OUWG) is a critical venue for receiving direct User feedback and development of future requirements from the operational community in regards to needed software enhancements and capabilities to support AS, SS, AA, and non-kinetic engagements. JTCG/ME continued to chair OUWGs, while representatives from USCENTCOM, USAFRICOM, USSTRATCOM, U.S. Pacific Command (USPACOM), USSOCOM, the Services, the Defense Intelligence Agency (DIA), the Defense Threat Reduction Agency (DTRA), the Fires Center of Excellence, Service School Houses, the Marine Aviation Weapons/Tactics Squadron, Operations Support Squadrons, Intelligence Squadrons, and numerous other operational units routinely participate.			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
JTCG/ME provided User training on its products. For JWS in FY16, JTCG/ME supported 23 JWS sessions at 19 CONUS/ OCONUS locations and approximately 340 students. For DCiDE, JTCG/ME supported numerous training classes to support units in USCENTCOM (e.g., Combined Task Forces, J-34 FIRES, and J2 Targeting Elements), USPACOM, and coalition partners (e.g., Australia). With new versions of JWS, DCiDE, DIEE, and J-ACE expected in FY17, there will be additional growth in training support. JTCG/ME provides help desk and training packages via the JMEM Product Information Access System (JPIAS), as well as product newsletters. FY16 support included addressing over 400 User support requests and developing training aids, such as the JWS Training Tidbits and Sample Weaponeering Problems. At times User requirements call for specialized solutions, such as weapons fielded between product releases and need for urgent target vulnerability surrogations to support current operations. JWS is the calculation engine used to develop Quick Weaponeering Guides/Probability of Kill Lookup Tool software to address some of these requirements. FY16 examples include updates for the AGM-114, AGM-176, GBU-49/BLU-129, GBU-49/BLU-126, GBU-12/BLU-129. JTCG/ME also leveraged the Collateral Effects Library to deliver 40 collateral damage mitigation analysis packages to operational Users for HVTs. There were seven rapid request target vulnerability surrogation packages (31 target-weapon pairings - filled based on Urgent Operational Needs), and a specialized AN/SEQ-3(XN-1) Solid State Laser-Quick Reaction Capability Laser Weapon System (SSL-QRC LAWS) Weaponeering Guide authored.			
FY 2017 Plans: Live Fire Test and Evaluation Major Test and Evaluation Programs The FY 2017 budget will support the Live Fire Test and Evaluation deputate's assessment of Test and Evaluation Master Plans, Test Plans, System Acquisition Reports, Defense Acquisition Executive Summary reports, and the development of Live Fire Test and Evaluation reports for those programs designated for OSD oversight. JLF Programs and LFT&E Initiatives The FY 2017 JLF budget will support at least 20 projects (tentatively 12 new starts and 8 projects continuing from previous FYs). Focus areas for JLF include projects that either: 1) characterize new survivability issues; 2) characterize new lethality issues; 3) improve accuracy and fidelity of weapon data; 4) improve test methods; 5) improve modeling and simulation methods; or 6) develop vulnerability data libraries for emerging non-kinetic threats.			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
JLF Air projects will continue to evaluate technologies and techniques to decrease vulnerabilities to all currently tested aircraft, against operationally relevant threats. Previously initiated projects that will be continued include developing a model for the OG-7V fragmentation grenade, quantifying the penetration of armor piercing incendiary munitions, evaluating the effectiveness of CV-22 Wing Fire Protection Systems, and evaluating the vulnerability of engines to MANPADS. New efforts will be initiated to (1) determine the root cause of CH-53 and CH-47 self-sealing bladder performance issues; (2) measure flammability traits of AH-64E Fire Detection Expansion Systems; and (3) develop a 12.7 x 108 mm Heat (High) Explosive Incendiary threat model prediction. JLF Ground projects will continue to optimize the mix of 30 mm ammunition, determine the fragment spray pattern and velocity for the MK84 warhead, and determine/mitigate collateral damage effects. Several new efforts will be initiated to develop better test methodologies: (1) develop instrumented inert warheads to mimic rocket-propelled grenade and anti-tank guided munitions; (2) develop better underbody blast threat and blast box analysis; and (3) develop improved instrumentation to assess local accelerative loading due to blast effects within armored vehicles. One effort will improve modeling and simulation of buried underbody blast effects. Finally, one effort will analyze statistical quantification of probability estimates of small caliber munitions in order to minimize the number of Live Fire tests required. JLF Sea projects include improving the modeling of simulation of equipment failure due to thermal effects, developing modeling tools for structural damage due to underwater explosions and their resulting bubble loading, and improving vulnerability hydrocodes by generating underwater explosion data that mimics multiple bubble pulsations. Live Fire initiatives will also include continued support of the execution and further development of a ground vehicle survivability course. JASP In FY 2017 the JASP will continue work on at least 28 multi-year RDT&E projects and initiate 12 new projects approved by the JASP Principal Members Steering Group and OSD/DOT&E. The JASP will develop measures to defeat Near-Peer Adversary Threat (N-PAT) radio-frequency and infrared guided threats coupled with quantifiable improvements in digital and hardware in the loop modeling and simulation capability and credibility. Improve aircraft force protection by increasing threat and flight environmental situational awareness, hostile fire identification, and degraded visual environment flight capabilities; advancing system hardening against ballistic and high energy laser threats; and improving aircraft crashworthiness. Improve aircraft survivability to fire by increasing the speed and efficiency of fire detection and suppression systems and the accuracy and confidence in prediction of threat initiated fires onboard aircraft. The JCAT will continue to support the Air Force, Army, Marine Corps and Navy by assessing combat damage incidents, training operators on threat effects and combat damage assessment, and reporting their findings to combatant commanders and the			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
DoD science and technology and acquisition communities. The JASP will continue supporting aircraft survivability education and information exchange through internet sites (restricted access and classified), by publishing the Aircraft Survivability Journal, developing educational materials and conducting training for the DoD and their contractors. The JASP will initiate, continue and complete other projects as approved by the JASP Principal Members Steering Group and OSD/DOT&E Joint Technical Coordinating Group for Munitions Effectiveness In FY17, JTCG/ME will continue to develop and standardize methodologies for evaluating munitions effectiveness, including target vulnerability characterization, munitions lethality, weapon system accuracy, and specific weapon-target pairings driven primarily from current operational lessons learned, Joint Staff Data Calls, and CCMDs' needs. JTCG/ME will deploy and continue to enhance future versions of its two major JTCG/ME Joint Munitions JMEM products, the JWS and J-ACE. The JTCG/ME will continue to coordinate and develop a non-kinetic JMEM capability, leveraging its FY16 Cyber JMEM prototyping efforts. Additionally, JTCG/ME will field and coordinate new capabilities, such as the DIEE and DCiDE Collateral Damage Estimation. Beyond traditional JMEM products, JTCG/ME will continue to support specialized weaponeering data and solutions for Warfighter urgent requirements and support Users. This includes standalone resources such as the Pk Lookup Tools, CDE tables, and munitions weaponeering guides. The objective is to provide efficient and effective support to meet CCMD current and future needs for agility in a dynamic operational environment. The JTCG/ME will field JWS v2.3 in FY17. JWS v2.3 will include enhanced data sets and capabilities with focus on connectivity to other targeting and mission planning capabilities for improved estimates and more seamless planning inherent in the concept of operational agility. When fielded, this capability will continue to enable CCMDs to have operational targeting, weaponeering, and collateral damage estimation capability in direct support of operations, mission planning, and training. JTCG/ME will continue to facilitate coalition interoperability in FY17. It will supply several JWS version releases to key coalition partners in support of current operations under FMS agreements. FY17 efforts will enable the United Kingdom, Canada, Australia, Republic of Korea, and other coalition partners to plan operational weaponeering and collateral damage estimates, support training and tactics development, and support force-level analyses. This capability is critical to the effectiveness and synergy of U.S. targeting and fires personnel working in combined partnered environments. JTCG/ME will finalize integration and operational testing of JWS v2.4 in FY17, with expected release in FY18. JWS v2.4 will be the last in the JWS v2.x product line and will include enhanced and updated weapons and target data sets, improved Graphical User Interphases for improved business logic and human system interaction, and improved database designs for speed and updating. JWS v2.4 will also include FIST v2.1 with Integrated Munitions Effects Assessment (IMEA) v11.1, enhanced imagery,			

Exhibit R-2A, RDT&E Project Justification: FY 2018 Operational Test and Evaluation, Defense		Date: May 2017
Appropriation/Budget Activity 0460 / 6	**R-1 Program Element (Number/Name)** PE 0605131OTE / *Live Fire Test and Evaluation (LFT&E)*	**Project (Number/Name)** 0605131OTE / *LFT&E*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
and enhanced Response Surface Mapping/ Penetration Launch Acceptability Region capabilities. JWS v2.4 will continue to address and implement CCMD requirements. JTCG/ME will develop JWS v3.x product line open architecture construct. This will enable interactive scene base weaponeering, maximize re-use and interoperability of capabilities, increase speed of modeling and simulation, support future hardware/software compatibility, and support allied releasability. JWS v3.x efforts will include formulation and refinement of the Joint Effects Library (JEL), which will provide the modules for the open architecture. JWS v3.x is the next evolution of agile, scalable capability solutions to meet the needs of the Joint Force in a dynamic operational environment. JTCG/ME will continue to support updates for DCiDE tools in FY17 to support the CJCSI 3160.01B – "No-Strike and the CDE Methodology". JTCG/ME will update and the accredit CER Reference Tables for selected air-to-surface and surface-to-surface weapons, which are the basic data that supports the CDE methodology. Changes will include additional updates for newly fielded/ updated systems, as well as new fragmentation and blast methodologies. JTCG/ME will also enhance and accredit improvements to the CEL Tool in support of advanced CDE mitigation techniques. JTCG/ME will field DIEE v2.0 with DPSS. The first fielded version of DIEE, v2.0, will integrate capabilities of an ELT, Precision Point Mensuration tool, and CDE tool, as well as other targeting applications in what we are calling an IDV. DIEE usage in Combatant Commands as their primary tool for full-integrated targeteering capability will continue to grow. JTCG/ME will develop and integrate DIEE v2.1 in FY17, with expected release in FY18. DIEE v2.1 will include CGS update, CEL interface development, additional imagery formats, and increased Common Operating Picture information on IDV. DIEE enhancements will continue to provide agile capability solutions for the Joint Force Commander in dynamic operational environments. JTCG/ME will field J-ACE v5.3 in FY17. J-ACE v5.3 will extend and update data sets for missile and aircraft target aero-performance, anti-air missile lethality, and air target vulnerability. The fielding of J-ACE v5.3 will allow greater aero performance options and the ability to estimate counter-measure effectiveness. A key enhancement of J-ACE v5.3 is the continued evolution of the J-ACE architecture to maximize re-use, interoperability of capabilities, support future hardware/software compatibility, and optimize integration and validation testing. JTCG/ME will continue to develop and progress to operational testing for J-ACE v5.4. J-ACE v5.4 will provide enhanced data, methodology, and descriptive material to support new weapons in the JAAM and EM. The fielding of J-ACE v5.4 in FY18 will allow for greater outbrief capability and connectivity by units, target detection estimation, counter Air Defense prediction capability, and enhanced architecture allowing future version growth and compatibility. J-ACE will enhance PCDS capability, and further evaluate			

Exhibit R-2A, RDT&E Project Justification: FY 2018 Operational Test and Evaluation, Defense		Date: May 2017
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
enhancement of aircraft maneuverability modeling with HIVE/BLUEMAX6. In addition, JAAM will include capability to evaluate two sided SEAD and DEAD; improved target detection capability leveraging NASIC IR and RF models; and multiple ESAMS capability. The J-ACE architecture will continue to be enhanced to maximize re-use, interoperability of capabilities, support future hardware/software compatibility, and optimize integration and validation testing. JTCG/ME will develop data and methodology for J-ACE v5.5. J-ACE v5.5 will include rotary wing aircraft capability and further expansion of electronic warfare and counter-measure capabilities. JTCG/ME will perform requirements analysis and plan for J-ACE v5.6 based on User requirements from working groups and training sessions to ensure alignment with User community. Joint Non-Kinetic Effectiveness JMEMs are intended to be the single source for operational Warfighters, analysts, targeteers, and planners to analyze offensive cyber capabilities and directed energy effectiveness. In FY17, JTCG/ME will continue to develop non-kinetic weaponeering tools and methodologies. JTCG/ME will continued to develop and mature the JMEM process for cyberspace operations and directed energy. FY17 efforts will build from FY16 that developed the foundational elements for JMEM production, including weapons characteristics, target vulnerability, and effects estimation tools. JTCG/ME will interact with the User community based on initial FY16 Cyber JMEM prototype. This will help with maturation process and further strengthen the foundation for a full J-NKE capability suite, to include other non-kinetic effects. JTCG/ME will continue to refine these initial efforts in FY17, with increased efforts in FY18. Since JTCG/ME products are User focused and requirements driven, there is considerable effort that goes into working with Users to establish Warfighter requirements for on-going efforts and future JTCG/ME products. JTCG/ME will chair OUWGs. OUWGs are a critical venue for receiving direct User feedback and development of future requirements from the operational community in regards to needed software enhancements and capabilities to support AS, SS, AA, and non-kinetic engagements. JTCG/ME will also continue User training on its products in FY17. With the fielding of new versions of JWS, DCiDE, DIEE, and J-ACE, there is an expected growth in training support requirements. JTCG/ME will provide help desk and training packages via the JPIAS, as well as product newsletters.			

Exhibit R-2A, RDT&E Project Justification: FY 2018 Operational Test and Evaluation, Defense		Date: May 2017
Appropriation/Budget Activity 0460 / 6	**R-1 Program Element (Number/Name)** PE 0605131OTE / *Live Fire Test and Evaluation (LFT&E)*	**Project (Number/Name)** 0605131OTE / *LFT&E*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
JTCG/ME will also support urgent operational needs with specialized solutions, such as weapons fielded between product releases and need for urgent target vulnerability surrogations to support current operations. ***FY 2018 Plans:*** Live Fire Test and Evaluation Major Test and Evaluation Programs The FY 2018 budget will support the Live Fire Test and Evaluation deputate's assessment of Test and Evaluation Master Plans, Test Plans, System Acquisition Reports, Defense Acquisition Executive Summary reports, and the development of Live Fire Test and Evaluation reports for those programs designated for OSD oversight. JLF Programs The FY 2018 budget will support the planning and execution of tests of fielded systems not previously tested under the Live Fire Programs to support DOT&E and operator needs. New threats, missions, TTPs, and combat environments will create the need for these tests and an assessment of performance. JLF projects will be defined, planned, and executed to provide survivability and lethality data on currently fielded U.S. systems; improve modeling and simulation tools; develop vulnerability data libraries for emerging threats; and initiate responses to quick reaction requests from theater. JASP In FY 2018 the JASP will continue work on at least 27 multi-year RDT&E projects and initiate about 5 new projects approved by the JASP Principal Members Steering Group and OSD/DOT&E. The JASP will develop measures to defeat Near-Peer Adversary Threat (N-PAT) radio-frequency and infrared guided threats coupled with quantifiable improvements in digital and hardware in the loop modeling and simulation capability and credibility. Improve aircraft force protection by increasing threat and flight environmental situational awareness, hostile fire identification, and degraded visual environment flight capabilities; advancing system hardening against ballistic and high energy laser threats; and improving aircraft crashworthiness. Improve aircraft survivability to fire by increasing the speed and efficiency of fire detection and suppression systems and the accuracy and confidence in prediction of threat initiated fires onboard aircraft. The JCAT will continue to support the Air Force, Army, Marine Corps and Navy by assessing combat damage incidents, training operators on threat effects and combat damage assessment, and reporting their findings to combatant commanders and the DoD science and technology and acquisition communities. The JASP will continue supporting aircraft survivability education and information exchange through internet sites (restricted access and classified), by publishing the Aircraft Survivability Journal, developing educational materials and conducting training for the DoD and their contractors. The JASP will initiate, continue and complete other projects as approved by the JASP Principal Members Steering Group and OSD/DOT&E.			

Exhibit R-2A, RDT&E Project Justification: FY 2018 Operational Test and Evaluation, Defense		Date: May 2017
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
Joint Technical Coordinating Group for Munitions Effectiveness In FY18, JTCG/ME will continue to develop and standardize methodologies for evaluating munitions effectiveness, including target vulnerability characterization, munitions lethality, weapon system accuracy, and specific weapon-target pairings driven primarily from current operational lessons learned, Joint Staff Data Calls, and CCMDs' needs. JTCG/ME will deploy and continue to enhance future versions of its two major JTCG/ME JMEM products, the JWS and J-ACE. The JTCG/ME will increase development of a non-kinetic JMEM capability, as well as the DIEE and Collateral Damage Estimation capabilities. Beyond traditional JMEM products, JTCG/ME will continue to support specialized weaponeering data and solutions for Warfighter urgent requirements and support Users. This includes standalone resources such as the Pk Lookup Tools, CDE tables, and munitions weaponeering guides. The objective is to provide efficient and effective support to meet CCMD current and future needs for agility in a dynamic operational environment. JTCG/ME will continue to expand coalition interoperability in FY18 with JWS version releases to key coalition partners in support of current operations under FMS agreements. Past efforts enabled the United Kingdom, Canada, Australia, Republic of Korea, and other coalition partners to plan operational weaponeering and collateral damage estimates, support training and tactics development, and support force-level analyses. This capability is critical to the effectiveness and synergy of U.S. targeting and fires personnel working in combined partnered environments. JTCG/ME will field JWS v2.4 in FY18. JWS v2.4 will include enhanced and updated weapons and target data sets, improved Graphical User Interphases for improved business logic and human system interaction, and improved database designs for speed and updates. When fielded, this capability will continue to enable CCMDs to have operational targeting, weaponeering, and collateral damage estimation capability in direct support of operations, mission planning, and training. JTCG/ME will develop and begin implementing JWS v3.x product line capabilities. JWS v3.x will enable interactive scene base weaponeering, maximize re-use and interoperability of capabilities, increase speed of modeling and simulation, support future hardware/software compatibility, and support allied releasability. JWS v3.x efforts will implement the JEL, which will provide open architecture capabilities. JWS v3.x is the next evolution of agile, scalable capability solutions to meet the needs of the Joint Force in a dynamic operational environment. Beginning in FY18 (based on FY18-22 increases), JTCG/ME will have focused efforts to enhance and validate collateral damage. The enhancement will support improvements in weaponeering methodology to minimize risk to mission and risk to forces while not increasing risk of collateral damage by providing foundational data for the development of higher fidelity predictive tools. Specific			

Exhibit R-2A, RDT&E Project Justification: FY 2018 Operational Test and Evaluation, Defense		Date: May 2017
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
efforts will generate buried ordnance characterization data based upon usage statistics from CCMD Expenditure reports, and AOR specific building debris data to enhance and validate current weaponeering/collateral damage estimation methodologies required by Strike Approval Authorities to make their strike decision calls. JTCG/ME will continue to support updates for DCiDE tools in FY18 to support the CJCSI 3160.01B – "No-Strike and the CDE Methodology". JTCG/ME will update and the accredit CER Reference Tables for selected AS/SS weapons, which are the basic data that supports the CDE methodology. JTCG/ME will field DIEE v2.2. DIEE enhancements will continue to provide agile capability solutions for the Joint Force Commander in dynamic operational environments. JTCG/ME will continue to sustain and monitor DIEE requirements with the User community. JTCG/ME will field J-ACE v5.4 in FY18. J-ACE v5.4 will provide enhanced data, methodology, and descriptive material to support new weapons in the JAAM and EM. JTCG/ME will finalize development and provide operational testing for J-ACE v5.5 in FY18. J-ACE v5.5 will include rotary wing aircraft capability and further expansion of electronic warfare and counter-measure capabilities. JTCG/ME will continue to develop, deliver, and integrate data and methodology for J-ACE v5.6 based on User requirements from working groups and training sessions to ensure alignment with User community. Joint Non-Kinetic Effectiveness JMEMs are intended to be the single source for operational Warfighters, analysts, targeteers, and planners to analyze offensive cyber capabilities and directed energy effectiveness. Beginning in FY18 (based on FY18-22 increases), JTCG/ME will enhance development of non-kinetic weaponeering tools and methodologies. JTCG/ME will continue to develop and mature the JMEM process for cyberspace operations and directed energy. JTCG/ME will expand efforts to review, analyze and synthesize offensive cyber capabilities and target data into standardized Joint Munitions Effectiveness Manuals. Cyber JMEM is a top priority of USCYBERCOMMAND and CCMDs to support their Warfighting Force. FY18 efforts will include increased manpower to further enhance and build upon prototype efforts in FY16 and FY17. These increased efforts and resources will culminate in institutionalized methodology and cyber effectiveness capabilities that will provide warfighters with non-kinetic weaponeering assessments and a common non-kinetic measurement to predict cyber capability outcomes. The publishing of JMEMs, accreditation of non-kinetic capability effectiveness methodologies, facilitation for validation of operational data, and the population of non-kinetic capability databases will help fulfill the Department's Cyber Strategy.			

Exhibit R-2A, RDT&E Project Justification: FY 2018 Operational Test and Evaluation, Defense		Date: May 2017
Appropriation/Budget Activity 0460 / 6	**R-1 Program Element (Number/Name)** PE 0605131OTE / *Live Fire Test and Evaluation (LFT&E)*	**Project (Number/Name)** 0605131OTE / *LFT&E*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
Since JTCG/ME products are User focused and requirements driven, there is considerable effort that goes into working with Users to establish Warfighter requirements for on-going efforts and future JTCG/ME products. JTCG/ME will chair OUWGs. OUWGs are a critical venue for receiving direct User feedback and development of future requirements from the operational community in regards to needed software enhancements and capabilities to support AS, SS, AA, and non-kinetic engagements. JTCG/ME will continue User training on its products in FY18, as well as provide help desk and training packages via the JPIAS and newsletters. JTCG/ME will support urgent operational needs with specialized solutions, such as weapons fielded between product releases and need for urgent target vulnerability surrogations to support current operations.			
Accomplishments/Planned Programs Subtotals	46.882	48.316	59.500

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

E. Performance Metrics

(U) Performance Measure: Percentage of required live fire test planning documents, assessments, munition effectiveness manuals, and reports applicable to acquisition programs on the OSD Test and Evaluation Oversight List and other special interest programs/legacy systems that are completed and delivered to the appropriate decision makers on time. Percentage of required products, such as test planning documents, munitions effectiveness manuals, tactic-techniques and reports that are developed and delivered to program managers and customers on time.

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Operational Test and Evaluation, Defense	Date: May 2017
Appropriation/Budget Activity 0460: *Operational Test and Evaluation, Defense* / BA 6: *RDT&E Management Support*	**R-1 Program Element (Number/Name)** PE 0605814OTE / *Operational Test Activities and Analyses*

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
Total Program Element	70.262	63.763	52.631	67.897	-	67.897	58.941	47.907	48.618	49.531	Continuing	Continuing
0605814OTE: *OTA&A*	70.262	63.763	52.631	67.897	-	67.897	58.941	47.907	48.618	49.531	Continuing	Continuing

A. Mission Description and Budget Item Justification

The Operational Test Activities and Analyses (OTA&A) programs are continuing efforts that provide management and oversight of test and evaluation functions and expertise to the Department of Defense (DoD). The OTA&A programs consist of three activities: Joint Test and Evaluation (JT&E); Threat Systems (TS); and Center for Countermeasures (CCM).

Joint Test and Evaluation projects are test and evaluation activities conducted in a joint military environment that develop process improvements. These multi-Service projects, chartered by the Office of the Secretary of Defense and coordinated with the Joint Staff, appropriate combatant commanders, and the Services, provide non-materiel solutions that improve: joint interoperability of Service systems, technical and operational concepts, joint operational issues, development and validation of joint test methodologies, and test data for validating models, simulations, and test beds. The JT&E projects address relevant joint war fighting issues in a joint test and evaluation environment by developing and providing new tactics, techniques, and procedures to improve joint capabilities and methodologies.

Threat Systems, based on a memorandum of agreement between the Director, Operational Test and Evaluation (DOT&E) and the Defense Intelligence Agency, provides DOT&E support in the areas of threat resource analysis, intelligence support and threat systems investments. Threat Systems provides threat resource analyses on the availability, capabilities and limitations of threat representations (threat simulators, targets, models, U.S. surrogates and foreign materiel) and analysis of test resources used for operational testing to support DOT&E's assessment of the adequacy of testing for those programs designated for oversight by DOT&E and the Office of the Under Secretary of Defense for Acquisition, Technology and Logistics. Threat Systems provides DOT&E assessment officers and other DOT&E activities with program specific threat intelligence support. Threat Systems also funds management, oversight, and development of common-use threat specifications for threat simulators, threat representative targets, and digital threat models used for test and evaluation.

The Center, a Joint Service Countermeasure (CM) T&E Activity, directs, coordinates, supports, and conducts independent countermeasure/counter-countermeasure (CCM) T&E activities of U.S. and foreign weapon systems, subsystems, sensors, and related components. The Center accomplishes this work in support of DOT&E, Deputy Assistant Secretary of Defense (DASD) for Developmental Test and Evaluation (DT&E), weapon system developers, and the Services. The Center's testing and analyses directly supports operational effectiveness and suitability evaluations of CM/CCM systems, such as missile warning and aircraft survivability equipment (ASE), used on rotary-wing and fixed-wing aircraft. The Center develops unique CM/CCM test equipment to support testing in operationally realistic environments. The Center determines effectiveness of precision guided weapon (PGW) systems and subsystems when operating in an environment degraded by CMs. Analysis and recommendations on CM/CCM effectiveness are provided to Service Program Offices, DOT&E, DASD (DT&E), and the Services. The Center also supports Service member exercises, training, and pre-deployment activities with expertise on CM/CCM technology and capabilities.

This Program Element includes funds to obtain Federally Funded Research and Development support and travel funds.

Exhibit R-2, RDT&E Budget Item Justification: FY 2018 Operational Test and Evaluation, Defense	Date: May 2017
Appropriation/Budget Activity 0460: *Operational Test and Evaluation, Defense* / BA 6: *RDT&E Management Support*	**R-1 Program Element (Number/Name)** PE 0605814OTE / *Operational Test Activities and Analyses*

B. Program Change Summary ($ in Millions)	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total
Previous President's Budget	63.763	52.631	58.002	-	58.002
Current President's Budget	63.763	52.631	67.897	-	67.897
Total Adjustments	0.000	0.000	9.895	-	9.895
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Program adjustment	-	-	-0.105	-	-0.105
• Program increases for Fifth Generation Aerial Target (5GAT)	-	-	10.000	-	10.000

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2016	FY 2017
Project: 0605814OTE: *OTA&A*		
Congressional Add: *Joint Test and Evaluation*	10.000	-
Congressional Add: *Threat Resource Analysis*	8.000	-
Congressional Add Subtotals for Project: 0605814OTE	18.000	-
Congressional Add Totals for all Projects	18.000	-

Change Summary Explanation

$10.000M 5GAT enhancement provides a second prototype to accelerate design and delivery of test ready 5th generation targets with the requisite threat characteristics for use in operational and developmental testing, as well as Weapons Systems Evaluation Programs (WSEP) and joint experimentation. The effort will provide validated cost data for alternative design and manufacturing approaches for future weapon system planning and development. This provides a near term solution for realistic testing of the F-35, F-22 3.2B, F-18, AIM-120, and other classified programs.

Exhibit R-2A, RDT&E Project Justification: FY 2018 Operational Test and Evaluation, Defense			Date: May 2017
Appropriation/Budget Activity 0460 / 6	R-1 Program Element (Number/Name) PE 0605814OTE / *Operational Test Activities and Analyses*	Project (Number/Name) 0605814OTE / *OTA&A*	

COST ($ in Millions)	Prior Years	FY 2016	FY 2017	FY 2018 Base	FY 2018 OCO	FY 2018 Total	FY 2019	FY 2020	FY 2021	FY 2022	Cost To Complete	Total Cost
0605814OTE: *OTA&A*	70.262	63.763	52.631	67.897	-	67.897	58.941	47.907	48.618	49.531	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The Operational Test Activities and Analyses (OTA&A) programs are continuing efforts that provide management and oversight of test and evaluation functions and expertise to the Department of Defense (DoD). The OTA&A programs consist of three activities: Joint Test and Evaluation (JT&E); Threat Systems (TS); and, the Center for Countermeasures (CCM).

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
Title: Operational Test Activities and Analyses	45.763	52.631	67.897

FY 2016 Accomplishments:

Joint Test and Evaluation (JT&E)

In FY 2016 four JT&E projects closed and four projects continued. One of the projects that closed was the Joint Base Architecture for Secure Industrial Control Systems Joint Test that tested joint industrial control systems network tactics, techniques, and procedures to better identify, mitigate, and recover from advanced, persistent cyber-attacks. Another project that closed was the Joint Tactical Air Picture Joint Test that developed tactics, techniques, and procedures to provide an improved tactical air picture that decreases the risk of hostile attacks and fratricide as well as increases the effective use of integrated air and missile defense systems.

Three new feasibility studies were conducted in FY 2016, two of which were selected to conduct joint tests.

Threat Systems

Threat Systems continued test planning working group participation and performed technical analyses to identify threat shortfalls; conducted special studies and provided current intelligence support tailored to specific U.S. weapon systems acquisitions; continued managing intelligence “deep dives” to produce intelligence in sufficient detail to develop new threat test assets; operated and maintained the modeling and simulation configuration control board for threat models and simulation used in test facilities; and continued the development and implementation of a tri-Service and Allied threat M&S roadmap to ensure infrared countermeasure systems have sufficient threat test assets. Moreover, Threat Systems represented DOT&E concerns at the Threat Steering Group (TSG) through the transition from the System Threat Assessment Reports (STARS) to the new Validated Online Lifecycle Threat (VOLT) report process. Represented DOT&E interests on Acquisition/Intelligence/ Requirement Task

Exhibit R-2A, RDT&E Project Justification: FY 2018 Operational Test and Evaluation, Defense		Date: May 2017
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B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
Force (AIRTF) and Executive Steering Group (AIRESG) and provided access to the Intelligence Mission Data Management Analysis & Reporting System (IMARS). Threat Systems proposed, managed, and oversaw threat test assets funded by the Test Resource Management Center that support DOT&E-identified threat shortfalls, identified candidate threat systems from the various intelligence agencies for possible development of models for use in test and evaluation. Initiated actions to embrace the growing and evolving DOT&E Cyber Threat requirements and analyzing the convergence of Cyber and Electronic Warfare effecting the baseline required for OT. Threat Systems also continued efforts to maintain a standard set of threat performance models. These activities helped DOT&E carry out its Title 10 responsibilities to assess test adequacy and determine whether testing is realistic and suitable, and promotes common solutions to Service threat representation needs. The Center The Center completed 32 T&E activities and analyzed and reported on more than 30 different systems, with special emphasis on rotary wing survivability, CM/CCM employment, warning and targeting systems, and PGWs. Several programs the Center supported received an independent assessment of our data/findings and test support for their CM/CCM evaluations. Our support was distributed across all the Services. Approximately 40% of the Center's efforts were spent on aircraft survivability equipment (ASE) testing, with the majority of these efforts in support of Joint Urgent Operational Need Statement (JUONS) and Urgent Universal Needs Statement (UUNS). About 22% of the Center's efforts were spent on PGW, foreign systems, and other types of field testing not related to ASE. Approximately 8% of the Center's efforts were dedicated to CM–based, pre-deployment training for rotary wing units. Twenty-six percent of the Center's efforts were spent on internal programs to improve test capabilities and to develop test methodologies for new types of T&E activities. These internal programs include the, Joint Standard Instrumentation Suite (JSIS) and Multi-Spectral Sea and Land Target Simulator (MSALTS) upgrades, a new test van to support the Remote Launcher system (RLS), and upgrades to existing equipment. The Center is expanding its presence/expertise in the electronic warfare (EW) realm with an internally funded threat radar stimulation capability. These systems will be used in support of testing for both Title 10 programs and ASE urgent operational needs. About 4% of the Center's efforts consisted of providing subject matter expertise and other support not directly related to scheduled test activities. The Center provided expertise to many organizations and was actively involved in the following panels: Joint Expendable Countermeasures (JECM) Integrated Product Team, Joint Infrared Countermeasures Multi Sensing Symposia Working Group (MSS IRCM WG), Joint Aircraft Survivability Program (JASP), Foreign Material Exploitation Working Group,			

Exhibit R-2A, RDT&E Project Justification: FY 2018 Operational Test and Evaluation, Defense		Date: May 2017
Appropriation/Budget Activity 0460 / 6	**R-1 Program Element (Number/Name)** PE 0605814OTE / *Operational Test Activities and Analyses*	**Project (Number/Name)** 0605814OTE / *OTA&A*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
Foreign Material Program T&E Subcommittee, Joint Countermeasures T&E Working Group (JCMT&E WG), and JCMT&E WG Hostile Fire Indicator (HFI) subgroup lead. ***FY 2017 Plans:*** Joint Test and Evaluation (JT&E) In FY 2017 JT&E plans on closing two projects that were started in FY 2015. One, the Joint Pre-/Post-Attack Operations Supporting Survivability & Endurability Joint Test, expected to close in February 2017, will develop and test procedures for protective posturing and mobile support that will mitigate the effects of an electromagnetic-pulse on mission critical functions. The other project to close in FY 2017 is the Joint Advanced Sensor to Shooter Joint Test, which is looking to develop, test and evaluate tactics, techniques, and procedures to more efficiently and effectively gain and maintain battle space awareness through integration of rapidly developed capabilities to support combat operations in anti-access and active denial environments Two projects that started in FY 2016 will continue through FY 2017. Four new feasibility studies are expected to be conducted in FY 2017, two of which will be selected to conduct joint tests. Threat Systems In FY 2017, Threat Systems will continue test planning working group participation and perform technical analyses to identify threat shortfalls; conduct special studies and provide current intelligence support tailored to specific U.S. weapon systems acquisitions based on the availability of funding. Threat Systems will: - Provide intelligence support to DOT&E staff to address specific questions on threat systems affecting programs on the OSD T&E Oversight list and provide briefings and special intelligence reports when necessary. - Provide DOT&E representative support at the Threat Steering Group (TSG) in the transitioning of the System Threat Assessment Reports (STARS) to the new Validated Online Lifecycle Threat (VOLT) report process. - Continue to represent DOT&E interests on Acquisition/Intelligence/ Requirement Task Force (AIRTF) and Executive Steering Group (AIRESG) and provide access to the Intelligence Mission Data Management Analysis & Reporting System (IMARS). - Support the US warfighter by providing threat intelligence to ensure operational and developmental testing occurs against realistic threat representations. - Sustain and manage threat M&S to support test and evaluation by overseeing and coordinating intelligence community developed threat models, performing threat model anomaly resolution resolving differences from live fire testing, integrating threat models into T&E facilities and distributing performance and signature models to T&E users.			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
- Review validation reports to independently ensure that correct threat data and critical parameters are presented in the report to assessment the threat representation's capabilities to replicate a real world threat system. - Continue identifying initiatives to improve cyberspace threat representation and prediction, cyber-economic threats to DoD systems, representative threat offensive and defensive cyber operations capabilities, and scalable cyberspace threat test environments that can interface with cyber test networks. - Manage Integrated Technical Evaluation and Analysis of Multiple Sources (ITEAMS) efforts supporting programs on the OSD T&E Oversight List by conducting intelligence "deep dives" to produce intelligence in sufficient detail to develop new threat test assets. - Initiate new ITEAMS efforts leading to the development of new threat systems for T&E. - Represent DOT&E at foreign material exchanges, inter-agency coordinating groups, and non-proliferation groups to raise awareness of T&E needs for foreign material, coordinate service requirements, and de-conflict and prioritize foreign material requirements for T&E. - Represent DOT&E at the Intelligence Mission Data Oversight Board responsible for development, production and sharing issues affecting the intelligence data supporting weapons systems acquisition. - Oversee legacy DOT&E investments and continue management and oversight of legacy and new Test Resource Management Center-funded threat system investments. These activities will ensure DOT&E carries out its Title 10 responsibilities to assess test adequacy and determine whether testing is realistic and suitable, and promotes common solutions to Service threat representation needs. The Center The Center has received 47 requests for support in FY17, which exceeds our capacity to support. The Center will assess the requests based on priority and schedule. The Center will test, analyze, and report on more than 30 systems, with emphasis on rotary wing survivability, CM/CCM employment, warning and targeting systems, and PGWs. Each program supported will receive an independent assessment of our data/findings and test support for CM/CCM evaluations. The Center will continue to emphasize support of the DOT&E enterprise, with a clear focus on Title 10 weapons systems, aircraft survivability and hostile fire initiatives. The Center will continue to conduct ongoing investigations towards determining and filling the gaps in EW and multimode system testing. In addition to these test activities, the Center will continue to provide CM expertise in pre-deployment events and training, as well as CM/CCM-focused tactics, techniques and procedures (TTP) development. Our support will be distributed across all the Services, as well as intelligence agencies and research and development activities. The Center will complete the initial development of JSIS and the High-Power Portable Radar Threat Simulator (HPRTS), which will be used in support of testing for both Title 10 programs and ASE urgent operational needs. The Center will complete the			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
development of a new test van to support more remote threat live fire testing. The Center will continue working with the Threat Simulator Working Group (TSWG)-sponsored HSIG model. The Center will provide expertise to many organizations and will continue to be actively involved in the following panels: JECM Integrated Product Team, Joint Infrared Countermeasures Multi Sensing Symposia Working Group (MSS IRCM WG), JASP, Foreign Material Exploitation Working Group, Foreign Material Program T&E Subcommittee, JCMT&E WG, and JCMT&E WG HFI subgroup lead. 5th Generation Aerial Target (5GAT) In FY17, the 5th Generation Aerial Target program will complete the government owned air vehicle and subsystems layout. The program will begin tooling and parts fabrication using carbon composite manufacturing methods. In addition, the program will begin the electronic attack equipment integration. ***FY 2018 Plans:*** Joint Test and Evaluation (JT&E) In FY2018 JT&E plans on closing two projects that were started in FY 2016. One, Digitally-Aided Close Air Support Joint Test, anticipated to close in May 2018, is developing and testing procedures so Joint Terminal Attack Controllers, Joint Fires Observers, and Close Air Support aircrew can realize the advantage of digital communications, including shared situational awareness, increased confidence prior to weapons release, and improved kill chain timeliness. The other project expected to close in FY 2018 is the Joint Cyber Insider Threat Joint Test, which is developing and testing procedures to proactively detect and respond to cyber insider threats before they have an adverse impact on military operations. Two projects that started in FY 2017 will continue through FY 2018. Four new feasibility studies are expected be conducted in FY 2018, two of which will be selected to conduct joint tests. Threat Systems In FY 2018, Threat Systems will continue test planning working group participation and perform technical analyses to identify threat shortfalls; conduct special studies and provide current intelligence support tailored to specific U.S. weapon systems acquisitions based on the availability of funding. Threat Systems will:			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
- Continue to provide intelligence support to DOT&E staff to address specific questions on threat systems affecting programs on the OSD T&E Oversight list and provide briefings and special intelligence reports when necessary. - Continue providing DOT&E representative support at the Threat Steering Group (TSG) in the transitioning of the System Threat Assessment Reports (STARS) to the new Validated Online Lifecycle Threat (VOLT) Report process. - Continue to represent DOT&E interests on Acquisition/Intelligence/ Requirement Task Force (AIRTF) and Executive Steering Group (AIRESG) and provide access to the Intelligence Mission Data Management Analysis & Reporting System (IMARS). - Continue identifying initiatives to improve cyberspace threat representation and prediction, cyber-economic threats to DoD systems, and scalable cyberspace threat test environments that can interface with cyber test networks. - Continue identifying initiatives to conduct offensive cyber operations (OCO) and defensive cyber operations (DCO) without significantly impacting critical operational capabilities. - Continue initiatives to improve satellite and space threat representations. - Support the US warfighter by providing threat intelligence to ensure operational and developmental testing occurs against realistic threat representations. - Sustain and manage threat M&S to support test and evaluation by overseeing and coordinating intelligence community developed threat models, performing threat model anomaly resolution resolving differences from live fire testing, integrating threat models into T&E facilities and distributing performance and signature models to T&E users. - Manage Integrated Technical Evaluation and Analysis of Multiple Sources (ITEAMS) efforts supporting programs on the OSD Oversight T&E List by conducting intelligence “deep dives” to produce intelligence in sufficient detail to develop new threat test assets. - Represent DOT&E at foreign material exchanges, inter-agency coordinating groups, and non-proliferation groups to raise awareness of T&E needs for foreign material, coordinate service requirements, and de-conflict and prioritize foreign material requirements for T&E. - Review validation reports to independently ensure that correct threat data and critical parameters are presented in the report to assessment the threat representation’s capabilities to replicate a real world threat system. - Represent DOT&E at the Intelligence Mission Data Oversight Board responsible for development, production and sharing issues affecting the intelligence data supporting weapons systems acquisition. - Oversee legacy DOT&E investments and continue management and oversight of legacy and new Test Resource Management Center-funded threat system investments. - Continue ITEAMS efforts leading to the development of new threat systems for T&E. These activities will ensure DOT&E carries out its Title 10 responsibilities to assess test adequacy and determine whether testing is realistic and suitable, and promotes common solutions to Service threat representation needs. The Center			

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B. Accomplishments/Planned Programs ($ in Millions)	FY 2016	FY 2017	FY 2018
The Center will test, analyze, and report on more than 30 systems, with special emphasis on aircraft survivability, CM/CCM employment, warning and targeting systems, and PGWs. Each program supported will receive an independent assessment of our data/findings and test support for CM/ CCM evaluations. The Center will continue to emphasize support of the DOT&E enterprise, with a clear focus on Title 10 weapons systems, aircraft survivability and hostile fire initiatives. Furthermore, the Center will continue to provide CM expertise in pre-deployment events and training, as well as CM/CCM-focused TTP development. Our support will be distributed across all the Services, as well as intelligence agencies and research and development activities. The Center will continue Improvement and Modernization (I&M) efforts to improve our T&E capabilities. The Center will continue to work with the HSIG model. The Center plans to continue upgrades to the JSIS system. The Center will provide expertise to many organizations and will continue to be actively involved in the following panels: JECM Integrated Product Team, Joint Infrared Countermeasures Multi Sensing Symposia Working Group (MSS IRCM WG), JASP, Foreign Material Exploitation Working Group, Foreign Material Program T&E Subcommittee, JCMT&E WG, and JCMT&E WG HFI subgroup lead.			
Accomplishments/Planned Programs Subtotals	45.763	52.631	67.897

	FY 2016	FY 2017
Congressional Add: Joint Test and Evaluation ***FY 2016 Accomplishments:*** Funding provided nine additional Quick Reaction Tests.	10.000	-
Congressional Add: Threat Resource Analysis ***FY 2016 Accomplishments:*** Funds were used to improve threat realism for testing. Specifically, increase cyber intelligence support to improve emerging cyberspace threat representation, prediction and threat environments; validate electronic warfare/cyber convergence efforts; and standardize approach for cyber threat folder creation. Funds were also used to extend validation support, improve automated tools that provide intelligence support, and improve the fidelity and availability of models and simulations needed for Test & Evaluation.	8.000	-
Congressional Adds Subtotals	18.000	-

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

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D. Acquisition Strategy

Not Applicable

E. Performance Metrics

Performance Measure: Percentage of required products, such as test planning documents, tactics, techniques, procedures, threat characteristics, assessments, and reports that are developed and delivered to program managers and customers on time. The on-time completion rate was computed on the basis of the number of required products that were submitted within established time standards relative to the total number of such products that fell due during the fiscal year.