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**Exhibit R-2, RDT&E Budget Item Justification: PB 2017 Air Force** **Date:** February 2016

<b>Appropriation/Budget Activity</b> 3600: <i>Research, Development, Test &amp; Evaluation, Air Force I BA 1: Basic Research</i>					<b>R-1 Program Element (Number/Name)</b> PE 0601108F / <i>High Energy Laser Research Initiatives</i>							
<b>COST (\$ in Millions)</b>	<b>Prior Years</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>	<b>FY 2018</b>	<b>FY 2019</b>	<b>FY 2020</b>	<b>FY 2021</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
Total Program Element	-	13.502	13.778	14.168	0.000	14.168	14.417	14.615	14.906	15.204	Continuing	Continuing
615097: <i>High Energy Laser Research Initiatives</i>	-	13.502	13.778	14.168	0.000	14.168	14.417	14.615	14.906	15.204	Continuing	Continuing

**A. Mission Description and Budget Item Justification**

This program funds basic research aimed at developing fundamental scientific knowledge to support future Department of Defense (DoD) high energy laser (HEL) systems. This program funds multi-disciplinary research institutes to conduct research on laser and beam control technologies. In addition, this program supports educational grants to stimulate interest in HELs. These educational grants are used for educational tools, scholarships, and summer intern employees in military laboratories. Efforts in this program have been coordinated through the DoD Science and Technology (S&T) Executive Committee process to harmonize efforts and eliminate duplication.

This program is in Budget Activity 1, Basic Research because this budget activity includes scientific study and experimentation directed toward increasing fundamental knowledge and understanding in those fields of the physical, engineering, environmental, and life sciences related to long-term national security needs.

<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017 Base</b>	<b>FY 2017 OCO</b>	<b>FY 2017 Total</b>
Previous President's Budget	13.950	13.778	14.168	0.000	14.168
Current President's Budget	13.502	13.778	14.168	0.000	14.168
Total Adjustments	-0.448	0.000	0.000	0.000	0.000
• Congressional General Reductions	0.000	0.000			
• Congressional Directed Reductions	0.000	0.000			
• Congressional Rescissions	0.000	0.000			
• Congressional Adds	0.000	0.000			
• Congressional Directed Transfers	0.000	0.000			
• Reprogrammings	0.000	0.000			
• SBIR/STTR Transfer	-0.448	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000

**Congressional Add Details (\$ in Millions, and Includes General Reductions)**

**Project:** 615097: *High Energy Laser Research Initiatives*

Congressional Add: *Program Increase*

Congressional Add Subtotals for Project: 615097

	<b>FY 2015</b>	<b>FY 2016</b>
	1.021	-
	1.021	-

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<b>Congressional Add Details (\$ in Millions, and Includes General Reductions)</b>		<b>FY 2015</b>	<b>FY 2016</b>
Congressional Add Totals for all Projects		1.021	-
<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017</b>
<p><b>Title:</b> HEL Devices</p> <p><b>Description:</b> Improve the fundamental understanding of HEL sources, to include solid state, fiber, and gas laser technologies.</p> <p><b>FY 2015 Accomplishments:</b> Continued research on innovative laser technologies in diode-pumped alkali, short-pulse, free electron, fiber and solid state laser technologies. Continued overseas efforts to leverage international technology advancements.</p> <p><b>FY 2016 Plans:</b> Continue innovative laser technologies in diode-pumped alkali, short-pulse, fiber, and solid state laser technologies. Continue overseas efforts to leverage international technology advancements.</p> <p><b>FY 2017 Plans:</b> Continue innovative laser technologies in diode-pumped alkali, short-pulse, fiber, and solid state laser technologies. Continue overseas efforts to leverage international technology advancements.</p>	6.425	6.438	6.728
<p><b>Title:</b> HEL Beam Control</p> <p><b>Description:</b> Improve the fundamental understanding of beam control technologies, as they relate to HEL applications. Conduct research in atmospheric characterization, metrology, control systems, algorithms, and beam control component technology.</p> <p><b>FY 2015 Accomplishments:</b> Continued research on innovative beam control architectures. Continued overseas efforts to leverage international technology advancements.</p> <p><b>FY 2016 Plans:</b> Continue research on innovative beam control architectures. Continue overseas efforts to leverage international technology advancements.</p> <p><b>FY 2017 Plans:</b> Continue research on innovative beam control architectures. Continue overseas efforts to leverage international technology advancements.</p>	5.166	6.240	6.240
<p><b>Title:</b> HEL Education</p> <p><b>Description:</b> Fund educational grants intended to stimulate interest in HELs among students.</p>	0.890	1.100	1.200

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<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2015</b>	<b>FY 2016</b>	<b>FY 2017</b>
<p><b><i>FY 2015 Accomplishments:</i></b>                      Provided scholarships and internships to support college students studying HEL degrees. Provided grants to Service Academies to stimulate HEL studies among military cadets. Funded publication of journals and support continuing education for professionals in the HEL field.</p> <p><b><i>FY 2016 Plans:</i></b>                      Provide scholarships and internships to support college students studying HEL degrees. Provide grants to Service Academies to stimulate HEL studies among military cadets. Fund publication of journals and support continuing education for professionals in the HEL field.</p> <p><b><i>FY 2017 Plans:</i></b>                      Provide scholarships and internships to support college students studying HEL degrees. Provide grants to Service Academies to stimulate HEL studies among military cadets. Fund publication of journals and support continuing education for professionals in the HEL field.</p>			
<b>Accomplishments/Planned Programs Subtotals</b>	12.481	13.778	14.168

	<b>FY 2015</b>	<b>FY 2016</b>
<b><i>Congressional Add:</i></b> Program Increase	1.021	-
<b><i>FY 2015 Accomplishments:</i></b> Conducted Congressionally-directed effort.		
<b>Congressional Adds Subtotals</b>	1.021	-

**D. Other Program Funding Summary (\$ in Millions)**

N/A

**Remarks**

**E. Acquisition Strategy**

N/A

**F. Performance Metrics**

Please refer to the Performance Base Budget Overview Book for information on how Air Force resources are applied and how those resources are contributing to Air Force performance goals and most importantly, how they contribute to our mission.

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