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Exhibit R-2, RDT&E Budget Item Justification: PB 2020 Air Force										Date: February 2019		
Appropriation/Budget Activity 3600: Research, Development, Test & Evaluation, Air Force I BA 7: Operational Systems Development					R-1 Program Element (Number/Name) PE 0702207F I Depot Maintenance (Non-IF)							
COST (\$ in Millions)	Prior Years	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total	FY 2021	FY 2022	FY 2023	FY 2024	Cost To Complete	Total Cost
Total Program Element	-	1.517	1.897	1.890	0.000	1.890	1.974	2.017	2.087	2.125	Continuing	Continuing
673326: Precision Measurement & Calibration	-	1.517	1.897	1.890	0.000	1.890	1.974	2.017	2.087	2.125	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This program develops, tests, and evaluates national and Air Force measurement standards (hardware) and calibration equipment in support of all Air Force programs and activities, including Precision Measurement Equipment Laboratories (PMELs) worldwide. Metrology research and development provides technology to support systems in all phases of development and acquisition, as well as Air Force R&D laboratories, test ranges, ground test facilities, and operational weapons systems support. Rapidly changing technology requires continuing research and development of measurement standards and calibration equipment to ensure modern weapon systems meet Air Force readiness objectives. This program addresses all metrology disciplines and includes the technology areas of laser, infrared, microwave, millimeter wave, optical, physical, mechanical, electrical, electronic, and ionizing radiation measurements. Metrology is a technical discipline devoted to the science of measurements and to the study and improvement of measurement technology. Measurements are the foundation of military system development, quality assurance, hardware conformance testing and system readiness tests. The integrity of these tests is assured through calibration and traceability assurance schemes. The capability to measure and calibrate must parallel the emergence of new technology, new ranges, and new capabilities of military systems. Lack of new measurement capability impedes or blocks the successful exploitation of new technologies, especially in the movement from development laboratory to production to deployment. R&D efforts are essential within the DoD to pace these requirements, otherwise, these same new systems will suffer time delays, excessive cost, and increased risk due to unreliable test results in all phases of development, production, deployment and operation.

This program element may include necessary civilian pay expenses required to manage, execute and deliver 0702207F. The use of such program funds would be in addition to the civilian pay expenses budgeted in program elements 0605826F, 0605827F, 0605828F, 0605829F, 0605830F, 0605831F, 0605832F, 0605898F, and 0605833F.

Program is managed by Air Force Materiel Command, Agile Combat Support Directorate, Air Force Metrology Division (WNM).

As directed in the FY 2018 NDAA, Sec 825, amendment to PL 114-92 FY 2016 NDAA, Sec 828 Penalty for Cost Overruns, the FY 2018 Air Force penalty total is \$14.373M. The calculated percentage reduction to each research, development, test and evaluation and procurement account will be allocated proportionally from all programs, projects, or activities under such account.

This program is in Budget Activity 7, Operational System Development because this budget activity includes development efforts to upgrade systems that have been fielded or have received approval for full rate production and anticipate production funding in the current or subsequent fiscal year.

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B. Program Change Summary (\$ in Millions)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget		1.528	1.897	1.936	0.000	1.936
Current President's Budget		1.517	1.897	1.890	0.000	1.890
Total Adjustments		-0.011	0.000	-0.046	0.000	-0.046
• 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		-0.011	0.000			
• Other Adjustments		0.000	0.000	-0.046	0.000	-0.046
C. Accomplishments/Planned Programs (\$ in Millions)				FY 2018	FY 2019	FY 2020
Title: Weapons Systems Measurement Standards				0.557	0.568	0.568
Description: Develop national measurement standards to support Air Force infrared / laser / electro-optical weapon systems and support equipment.						
FY 2019 Plans: Continued development of national measurement standards to support Air Force infrared / laser / electro-optical weapon systems and support equipment.						
FY 2020 Plans: Continue development of national measurement standards to support Air Force infrared / laser / electro-optical weapon systems and support equipment.						
Title: Electrical Measurements				0.000	0.000	0.000
Description: Develop standards for electrical measurements to support high accuracy electronic test equipment.						
FY 2019 Plans: Continued development of standards for electrical measurements to support high accuracy electronic test equipment.						
FY 2020 Plans: Continue development of standards for electrical measurements to support high accuracy electronic test equipment.						
Title: Radar Support/Communications				0.300	0.712	0.705

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020
Description: Develop standards for radar support, RF communication systems, and radar cross section range measurements. FY 2019 Plans: Developed standards for radar support, RF communication systems, and radar cross section range measurements. FY 2020 Plans: Continue development of standards for radar support, RF communication systems, and radar cross section range measurements. FY 2019 to FY 2020 Increase/Decrease Statement: Decrease because of rate change.				
Title: Calibration Description: Develop improved calibration standards to support physical, mechanical, and electro-mechanical support equipment. FY 2019 Plans: Continued development of improved calibration standards to support physical, mechanical, and electro-mechanical support equipment. FY 2020 Plans: Continue development of improved calibration standards to support physical, mechanical, and electro-mechanical support equipment.		0.560	0.560	0.560
Title: Analytical Metrology Description: Develop standards, models, and procedures to support analytical metrology applications. FY 2019 Plans: Continued development of standards, models, and procedures to support analytical metrology applications. FY 2020 Plans: Continue development of standards, models, and procedures to support analytical metrology applications.		0.100	0.057	0.057
Accomplishments/Planned Programs Subtotals		1.517	1.897	1.890
Other Service Funding Adjustment		0.000	0.000	-
Air Force Subtotals		1.517	1.897	1.890

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D. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
E. Acquisition Strategy Primarily accomplished through intergovernmental transfer between the Department of Defense and other Federal Departments.		
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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Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force												Date: February 2019			
Appropriation/Budget Activity 3600 / 7						R-1 Program Element (Number/Name) PE 0702207F / Depot Maintenance (Non-IF)				Project (Number/Name) 673326 / Precision Measurement & Calibration					
Product Development (\$ in Millions)				FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total			
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Cost To Complete	Total Cost	Target Value of Contract
National Institute of Standards & Technology	MIPR	AFMETCAL : Heath, OH	-	1.207	Aug 2018	1.486	Aug 2019	1.479	Aug 2020	-		1.479	Continuing	Continuing	1.200
Department of Defense	MIPR	AFMETCAL : Heath, OH	-	0.200	Aug 2018	0.200	Aug 2019	0.200	Aug 2020	-		0.200	Continuing	Continuing	0.200
Industry	SS/T&M	AFMETCAL : Heath, OH	-	0.110	Aug 2018	0.211	Aug 2019	0.211	Aug 2020	-		0.211	Continuing	Continuing	0.099
Subtotal			-	1.517		1.897		1.890		-		1.890	Continuing	Continuing	N/A
			Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Subtotals			-	1.517		1.897		1.890		-		1.890	Continuing	Continuing	N/A
Other Service Funding Adjustment			-	0.000		0.000		-		-		-			-
Project Cost Totals			-	1.517		1.897		1.890		-		1.890	0.000	0.000	-
Remarks															

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Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force			Date: February 2019		
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			Project (Number/Name) 673326 / Precision Measurement & Calibration		

	FY 2018				FY 2019				FY 2020				FY 2021				FY 2022				FY 2023				FY 2024			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Standards Development																												
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Exhibit R-4A, RDT&E Schedule Details: PB 2020 Air Force		Date: February 2019
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Standards Development				
Standards Development	1	2018	4	2023