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**Exhibit R-2, RDT&E Budget Item Justification:** PB 2023 Air Force **Date:** April 2022

<b>Appropriation/Budget Activity</b> 3600: <i>Research, Development, Test &amp; Evaluation, Air Force / BA 5: System Development &amp; Demonstration (SDD)</i>	<b>R-1 Program Element (Number/Name)</b> PE 0604706F / <i>Life Support Systems</i>
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COST (\$ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	-	27.748	25.437	47.442	0.000	47.442	27.975	25.308	26.087	29.788	Continuing	Continuing
65412A: <i>Life Support Systems</i>	-	27.748	25.437	47.442	0.000	47.442	27.975	25.308	26.087	29.788	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

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

This program saves Airmen's lives and improves aircrew performance through better aircrew flight equipment and airman combat systems. Air Force acquisition teams lead the upgrade and fielding of new equipment and systems by assessing deficiencies in existing equipment, identifying and assessing existing products or developing new technology, and conducting required Safe-to-Fly tests, certifications, and studies. Program efforts include, but are not limited to, the following projects: directed energy protective equipment; flight helmets and visors; oxygen breathing systems for aircrew; radios and locator beacons; support equipment; nuclear flash blindness protection; night vision devices; noise reduction devices; all types of flight suits and ensembles to protect aircrew against environmental threats; anti-gravity (anti-G) suits; flame resistant, retardant and blast/ballistic protective gear; aircraft seating; impact protection equipment; flotation devices; parachutes; ejection systems; post-ejection survival systems; physiological monitoring devices and other aircrew, life support, and ground crew systems required by the warfighter.

The total cost of the Next Gen Fixed Wing Helmet (NGFWH) Middle Tier of Acquisition effort is \$21.9M, including RDT&E and procurement of prototype units. The NGFWH program is fully funded across the Future Years Defense Program.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver weapon system capability. The use of such program funds would be in addition to the civilian pay expenses budgeted in program element element 0605827F, 0605828F, 0605829F, 0605831F, 0605832F, 0605833F, 0605898F, and 0606398F. In FY21 0.859M was expended for civilian pay expenses in this program element, and in FY22 1.1M is forecast for civilian pay expenses in this program.

This program is in Budget Activity 5, System Development and Demonstration (SDD) because it has passed Milestone B approval and is conducting engineering and manufacturing development tasks aimed at meeting validated requirements prior to full rate production.

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<b>B. Program Change Summary (\$ in Millions)</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>
Previous President's Budget	28.608	25.437	0.000	0.000	0.000
Current President's Budget	27.748	25.437	47.442	0.000	47.442
Total Adjustments	-0.860	0.000	47.442	0.000	47.442
• 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	-0.860	0.000			
• Other Adjustments	0.000	0.000	47.442	0.000	47.442

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

**Project:** 65412A: *Life Support Systems*

Congressional Add: *Physiological Monitoring*

Congressional Add Subtotals for Project: 65412A

Congressional Add Totals for all Projects

	<b>FY 2021</b>	<b>FY 2022</b>
	5.000	0.000
	5.000	0.000
	5.000	0.000

**Change Summary Explanation**

The FY2022 President's Budget submittal did not reflect FY2023 through FY2026 funding. Therefore, an explanation of the change between the two budget positions for FY2023 cannot be made in a relevant manner.

**C. Accomplishments/Planned Programs (\$ in Millions)**

	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>
<b>Title:</b> Aircrew Performance Studies/Technology Projects and Minor Development Efforts	8.818	10.710	15.505	0.000	15.505
<b>Description:</b> Air Force Life Cycle Management Center's Aircrew Performance Branch is the single USAF focal point for Aircrew Flight Equipment (AFE) Safe-to-Fly (STF) testing certification, addressing Safety Investigation Board (SIB) recommendations, along with studies and analysis. In addition, funding is for efforts that are responses to real-time capability gaps identified by the warfighter which may be satisfied by testing and qualifying commercial-off-the-shelf (COTS) products and/or performing minor development efforts that require less than \$10M per year related to aircrew flight equipment and life support equipment. Previous successful efforts may evolve into enduring capabilities as other users and MAJCOMs seek to incorporate these STF					

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<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
<p>assets into their inventory. Integrated Aircrew Ensemble (IAE), Aircrew Body Armor (ABA), Aircrew Laser Eye Protection - Technical Insertion (ALEP-TI), Next Generation Fixed Wing Helmet (NGFWH), BA-X Low Profile Parachute (LPP) and Nuclear Flash Blindness Goggles (NFBG) are currently the active programs within Life Support Systems (LSS). Funds may be used to address associated emerging aircrew, ground crew, and egress requirements, and for program management activities.</p> <p><b>FY 2022 Plans:</b> Perform STF testing and certification of COTS products. Address SIB recommendations. Continue the development and test efforts for aircrew laser eye protection - technical insertion (ALEP-TI), radio upgrades, next generation fixed wing helmet, next generation nuclear flash blindness technology, and improvement of parachute/flotation devices.</p> <p><b>FY 2023 Base Plans:</b> Continue to perform STF testing and certification of COTS products. Address SIB recommendations. Continue the development and test efforts for aircrew laser eye protection - technical insertion (ALEP-TI), radio upgrades, next generation fixed wing helmet, next generation nuclear flash blindness technology, and improvement of parachute/flotation devices.</p> <p><b>FY 2023 OCO Plans:</b> N/A</p> <p><b>FY 2022 to FY 2023 Increase/Decrease Statement:</b> The ramping up of the Nuclear Flash Blindness Goggles program is driving the increase in budget authority</p>					
<p><b>Title:</b> Next Generation Ejection Seat</p> <p><b>Description:</b> The new ejection seat escape system safely accommodates greater variation in aircrew minimum and maximum weights at minimum aircrew sitting height of 31 inches, including 59% of the female pilot population, and the use of Helmet Mounted Displays. It reduces the risk of injuries to the arms and legs (especially due to limb flail), neck, and spinal column throughout ejection phases.</p> <p><b>FY 2022 Plans:</b> Continue contract effort awarded as part of Congressional add for initial F-15 platform system qualification, test assets, and training materials. The functional baseline system qualification will validate a common ejection system design for integration with the F-15, F-16, F-22, B-1, and A-10 aircraft platforms.</p> <p><b>FY 2023 Base Plans:</b></p>	8.724	10.000	24.591	0.000	24.591

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<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>
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<p>Continue contract effort awarded for aircraft integration qualification testing for follow-on NGES variants. Initial platform first article test, test readiness review, and delta qualification sled tests completion. F-16 is scheduled to begin in FY23 to support continuous ejection system qualification.</p> <p><b>FY 2023 OCO Plans:</b> N/A</p> <p><b>FY 2022 to FY 2023 Increase/Decrease Statement:</b> Increase due to additional anthropometric body range studies, MASS sequencer obsolescence, early operational assessment of maintainability, and DCAA rate increases.</p>					
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<p><b>Title:</b> Female Airmen Equipment</p> <p><b>Description:</b> Female Fitment within Human Systems Division (HSD) of the Air Force Life Cycle Management Center develops and sustains organizational clothing and individual equipment (OCIE) &amp; personal protective equipment (PPE) for female Airmen to enhance mission performance while improving safety and survival. HSD aligned Female Fitment as a top priority, matching CSAF vision, and ensures that the fullest extent of the AF female anthropometric range is incorporated into all of its programs. Outreach with other AF organizations and sister services ensures that requirements are collected to vector current and future programs. Anthropometric data collection ensures that these programs produce the OCIE and PPE that will allow women to perform their best in the missions they are assigned. OCIE and PPE for female aircrew includes, but is not limited to, the development and refinement of flight suits, bladder relief systems, helmets, ejection seats, G-suits, aircrew body armor, oxygen masks, and feedback mechanisms.</p> <p><b>FY 2022 Plans:</b> Continue testing and development of female flight equipment: Items anticipated to be worked include the AF GearFit App, in-flight bladder relief systems, aircrew harness, oxygen masks, and anthropometric studies</p> <p><b>FY 2023 Base Plans:</b> Continue testing and development of female flight equipment: Items anticipated to be worked include, but not limited to, the AF GearFit, aircrew harness, anthropometric studies</p> <p><b>FY 2023 OCO Plans:</b> N/A</p> <p><b>FY 2022 to FY 2023 Increase/Decrease Statement:</b></p>	5.206	4.727	7.346	0.000	7.346
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<b>C. Accomplishments/Planned Programs (\$ in Millions)</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>
The decrease from FY22 tied to program transition from initial AF ramp to focus on female fitment gap.					
<b>Accomplishments/Planned Programs Subtotals</b>	22.748	25.437	47.442	0.000	47.442

	<b>FY 2021</b>	<b>FY 2022</b>
<b>Congressional Add:</b> Physiological Monitoring	5.000	0.000
<b>FY 2021 Accomplishments:</b> The Physiological Monitoring Congressional Add acquires test assets required to evaluate SPYDR system and perform Developmental Test.		
<b>FY 2022 Plans:</b> N/A		
<b>Congressional Adds Subtotals</b>	5.000	0.000

<b>D. Other Program Funding Summary (\$ in Millions)</b>	<b>FY 2021</b>	<b>FY 2022</b>	<b>FY 2023 Base</b>	<b>FY 2023 OCO</b>	<b>FY 2023 Total</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>	<b>FY 2027</b>	<b>Cost To Complete</b>	<b>Total Cost</b>
• OPAF 04 Line Item 842990: <i>Items Less Than \$5 Million (Safety and Rescue Equipment)</i>	24.407	62.195	65.744	-	65.744	72.740	70.459	57.247	65.590	Continuing	Continuing

**Remarks**

**E. Acquisition Strategy**  
The majority of efforts funded in this project employ a streamlined acquisition approach. Whenever practical, Government-Off-The-Shelf/Commercial-Off-The-Shelf (GOTS/COTS) items are tested and evaluated as candidates for solutions to user needs. This normally involves characterization, verification, and qualification testing to ensure GOTS/COTS equipment is properly certified and adapted for military purposes. However, acquisition strategies may be carried out at the project level for traditional Engineering and Manufacturing Development (EMD), e.g., Integrated Aircrew Ensemble (IAE) and Aircrew Laser Eye Protection - Technical Insertion (ALEP-TI). Funds may be used to address associated emerging aircrew/ground crew/egress requirements and for program management activities.

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force** **Date:** April 2022

<b>Appropriation/Budget Activity</b> 3600 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604706F / <i>Life Support Systems</i>	<b>Project (Number/Name)</b> 65412A / <i>Life Support Systems</i>
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<b>Product Development (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Congressional Add for Physiological Monitoring	MIPR	DIU : PICATINNY ARSENAL, NJ	-	4.849	Jul 2021	-		-		-		-	Continuing	Continuing	-
Aircrew Performance Studies/Technology Projects/Minor Development Efforts	Various	Multiple Contractors : TBD	-	5.918	Jan 2021	9.430	Jan 2022	10.505		-		10.505	Continuing	Continuing	-
Integrated Aircrew Ensemble (IAE)	C/CPFF	Tiax : Lexington, MA	-	0.081	Jan 2021	-		-		-		-	Continuing	Continuing	-
Next Generation Ejection Seat (NGES)	SS/CPFF	Collins Aerospace : Colorado Springs, CO	-	7.864	Oct 2020	7.291	Feb 2022	24.591		-		24.591	Continuing	Continuing	-
Female Flight Equipment	Various	Multiple Contractors : TBD	-	5.206	Dec 2020	4.727	Feb 2022	5.397		-		5.397	Continuing	Continuing	-
<b>Subtotal</b>			-	23.918		21.448		40.493		-		40.493	Continuing	Continuing	N/A

<b>Support (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Direct Cite Authority	TBD	AFLCMC : Wright-Patterson AFB, OH	-	0.860	Dec 2020	1.209		1.209		-		1.209	Continuing	Continuing	-
<b>Subtotal</b>			-	0.860		1.209		1.209		-		1.209	Continuing	Continuing	N/A

<b>Test and Evaluation (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Tests (NGES, ACES, NGFWH, etc.)	Various	Various : Various, NV	-	1.650		2.130		4.750		-		4.750	Continuing	Continuing	-
<b>Subtotal</b>			-	1.650		2.130		4.750		-		4.750	Continuing	Continuing	N/A

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**Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Air Force** **Date:** April 2022

<b>Appropriation/Budget Activity</b> 3600 / 5	<b>R-1 Program Element (Number/Name)</b> PE 0604706F / <i>Life Support Systems</i>	<b>Project (Number/Name)</b> 65412A / <i>Life Support Systems</i>
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<b>Management Services (\$ in Millions)</b>				FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Program Management Administration (PMA)	TBD	AFLCMC : Wright-Patterson AFB, OH	-	1.320		0.650		0.990		-		0.990	Continuing	Continuing	-
<b>Subtotal</b>			-	1.320		0.650		0.990		-		0.990	Continuing	Continuing	N/A

**Remarks**  
PMA Description: Program Management Support and Travel.

	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
<b>Project Cost Totals</b>	-	27.748	25.437	47.442	-	47.442	Continuing	Continuing	N/A

**Remarks**  
FINANCIAL PERFORMANCE: The Integrated Aircrew Ensemble (IAE) project is evaluated against traditional Research and Development (R&D) program expenditure benchmarks. Unlike many traditional R&D programs, however, the IAE contract is a FPIF contract with progress payments. "XX" percent of incurred costs are withheld until the end of the contract, when they are liquidated. Mandatory funding obligations and progress payment withholds will cause the program to lag traditional expenditure benchmarks, painting an inaccurate portrait of overall program health.

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**Exhibit R-4, RDT&E Schedule Profile: PB 2023 Air Force** **Date:** April 2022

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FY 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
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

<b><i>Life Support Systems RDTE Efforts</i></b>																												
Aircrew Performance Aircrew Laser Eye Protection - Technical Insertion (ALEP-TI)																												
Continue projects in support of Aircrew Performance/Female Equipment																												
Aircrew Performance Next Generation Fixed Wing Helmet Development																												
Next Generation Ejection Seat Qualification Effort																												
Integrated Aircrew Ensemble G-Suit Redesign																												
Female Bladder Relief																												
A2CU-F																												
Maternity FDU																												
Physiological Monitoring																												

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**Exhibit R-4A, RDT&E Schedule Details: PB 2023 Air Force** **Date:** April 2022

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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<b><i>Life Support Systems RDTE Efforts</i></b>				
Aircrew Performance Aircrew Laser Eye Protection - Technical Insertion (ALEP-TI)	1	2021	4	2027
Continue projects in support of Aircrew Performance/Female Equipment	1	2021	4	2025
Aircrew Performance Next Generation Fixed Wing Helmet Development	1	2021	4	2023
Next Generation Ejection Seat Qualification Effort	1	2021	4	2027
Integrated Aircrew Ensemble G-Suit Redesign	1	2021	3	2024
Female Bladder Relief	2	2021	4	2027
A2CU-F	1	2021	4	2027
Maternity FDU	1	2021	4	2027
Physiological Monitoring	1	2022	4	2023