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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 5: System Development & Demonstration (SDD)					R-1 Program Element (Number/Name) PE 0604706F I Life Support Systems							
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	-	10.342	8.919	8.624	0.000	8.624	18.701	18.909	19.253	19.599	Continuing	Continuing
65412A: Life Support Systems	-	10.342	8.919	8.624	0.000	8.624	18.701	18.909	19.253	19.599	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/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; anti-gravity (anti-G) suits; flame resistant, retardant and blast/ballistic protective gear; aircraft seating; impact protection equipment; flotation devices; parachutes; ejection seats; physiological monitoring devices and other aircrew/life support/ground crew systems required by the warfighter.

This program element may include necessary civilian pay expenses required to manage, execute, and deliver Life Support capabilities. 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.

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 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. Program Change Summary (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Previous President's Budget	9.060	8.919	8.624	0.000	8.624
Current President's Budget	10.342	8.919	8.624	0.000	8.624
Total Adjustments	1.282	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	1.600	0.000			
• SBIR/STTR Transfer	-0.318	0.000			
• Other Adjustments	0.000	0.000	0.000	0.000	0.000
Change Summary Explanation					
FY 2018 funds include \$1.600 million dollars that was a below threshold reprogramming to support female aircrew flight equipment efforts					
C. Accomplishments/Planned Programs (\$ in Millions)	FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
Title: Aircrew Performance Studies/Technology Projects and Minor Development Efforts	5.433	5.306	6.999	-	6.999
Description: 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 / MAJCOMs seek to incorporate these STF assets into their inventory. The Cold Weather Aviation System (CWAS), Aircrew Body Armor (ABA), 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/egress requirements and for program management activities.					
FY 2019 Plans: Perform STF testing and certification of COTS products. Address SIB recommendations. Formulate an acquisition strategy for next generation nuclear flash blindness technology. Continue the development/test					

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C. Accomplishments/Planned Programs (\$ in Millions)		FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total
efforts of aircrew laser eye protection (ALEP), physiological monitoring devices, next generation fixed wing helmet, female aircrew accommodations, and improvement of parachute/flotation devices. FY 2020 Base Plans: Perform STF testing and certification of COTS products. Address SIB recommendations. Continue the development/test efforts of aircrew laser eye protection (ALEP), radio upgrades, next generation fixed wing helmet, next generation nuclear flash blindness technology, female aircrew accommodations, and improvement of parachute/flotation devices. FY 2019 to FY 2020 Increase/Decrease Statement: Funding increase due to increased activity for the Fixed Wing Helmet Upgrade						
Title: Integrated Aircrew Ensemble (IAE) Description: The Integrated Aircrew Ensemble (IAE) is a multi-layer battle ready system of protective clothing, survival equipment, and anti-G protection equipment worn by aircrew members. The ensemble can layer up to seven (7) components allowing for flexible combinations depending on aircraft type, mission, and threat. Each component design is unique but engineered as a single integrated ensemble to improve mobility by reducing bulk, reducing aircrew fatigue from thermal stress using new breathable materials, and increasing overall system performance. The ensemble components are: 1) outer flight layer, 2) Environmental Protection Layer (EPL) with gloves, 3) Chemical Biological Radiological Layer (CBRL) with glove inserts, 4) Life Preserver Unit (LPU), 5) Counter Chest Pressure Bladder (CCPB), 6) survival vest, and 7) G-suit. FY 2019 Plans: Complete Low Rate Initial Production (LRIP) and Initial Operational Testing and Evaluation. Begin development and test efforts for the G-Suit deficiency corrections. FY 2020 Base Plans: Complete IAE G-Suit deficiency correction. Begin modification efforts for the IAE Rotary/Fixed Wing variant FY 2019 to FY 2020 Increase/Decrease Statement: Funding decreased due to IOT&E completion.		4.359	2.688	0.725	-	0.725
Title: Advanced Concept Ejection Seat Description: Ejection Seat upgrade for B-2 FY 2019 Plans:		0.125	0.125	0.000	-	0.000

UNCLASSIFIED

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C. Accomplishments/Planned Programs (\$ in Millions)											
					FY 2018	FY 2019	FY 2020 Base	FY 2020 OCO	FY 2020 Total		
Complete reporting from testing agency.											
FY 2020 Base Plans: N/A											
FY 2019 to FY 2020 Increase/Decrease Statement: Development and testing completes in FY19.											
Title: Next Generation Ejection Seat					0.425	0.800	0.900	-	0.900		
Description: The new ejection seat escape system shall safely accommodate greater variation in aircrew minimum/maximum weights, a minimum aircrew sitting height of 31 inches, and the use of Helmet Mounted Displays. It shall reduce the risk of injuries to the arms and legs (especially limb flail), neck, and spinal column throughout the entire ejection event.											
FY 2019 Plans: Program costs associated with pre-award EMD contract effort to begin qualification testing of selected seat and receive long lead items.											
FY 2020 Base Plans: Continuing program costs associated with pre-award EMD contract effort to begin qualification testing of selected seat and receive long lead items.											
FY 2019 to FY 2020 Increase/Decrease Statement: Funding increase due to increase pre-award activities.											
Accomplishments/Planned Programs Subtotals					10.342	8.919	8.624	-	8.624		
D. Other Program Funding Summary (\$ in Millions)											
Line Item	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
• OPAF 04 Line Item 842990: <i>Items Less Than \$5 Million</i> <i>(Safety and Rescue Equipment)</i>	28.969	24.043	22.206	22.200	44.406	22.607	155.324	158.119	-	Continuing	Continuing
Remarks											

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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 (ALEP) Block III. Funds may be used to address associated emerging aircrew/ground crew/egress requirements and for program management activities.		
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.		

UNCLASSIFIED

Exhibit R-3, RDT&E Project Cost Analysis: PB 2020 Air Force												Date: February 2019			
Appropriation/Budget Activity 3600 / 5						R-1 Program Element (Number/Name) PE 0604706F / Life Support Systems				Project (Number/Name) 65412A / Life Support Systems					
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
Aircrew Performance Studies/Technology Projects/Minor Development Efforts	Various	Multiple Contractors : TBD	-	4.017		4.193		4.314		-		4.314	Continuing	Continuing	-
Integrated Aircrew Ensemble (IAE)	C/FPIF	Tiax : Lexington, MA	-	4.300	Mar 2018	1.950	Feb 2019	0.585	Jan 2020	-		0.585	Continuing	Continuing	-
Advanced Concept Ejection Seat (ACES)	SS/FFP	United Technologies Aerospace Sys : Colorado Springs, CO	-	0.125	May 2018	-		-		-		-	Continuing	Continuing	-
Next Generation Ejection Seat	TBD	TBD : NV	-	0.000	Dec 2018	0.650	Apr 2019	0.750	Feb 2020	-		0.750	Continuing	Continuing	-
Subtotal			-	8.442		6.793		5.649		-		5.649	Continuing	Continuing	N/A
Test and Evaluation (\$ 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
Program Tests (IAE, ACES, CWAS, etc.)	Various	Various : Various, NV	-	1.125	Feb 2018	1.325	Feb 2019	2.250		-		2.250	Continuing	Continuing	-
Subtotal			-	1.125		1.325		2.250		-		2.250	Continuing	Continuing	N/A
Management Services (\$ 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
Program Management Administration (PMA)	TBD	AFLCMC : Wright-Patterson AFB, OH	-	0.775		0.801		0.725		-		0.725	Continuing	Continuing	-
Subtotal			-	0.775		0.801		0.725		-		0.725	Continuing	Continuing	N/A
Remarks															
PMA Description: Program Management Support and Travel.															

UNCLASSIFIED

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Appropriation/Budget Activity 3600 / 5					R-1 Program Element (Number/Name) PE 0604706F / <i>Life Support Systems</i>					Project (Number/Name) 65412A / <i>Life Support Systems</i>			
	Prior Years	FY 2018		FY 2019		FY 2020 Base		FY 2020 OCO		FY 2020 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	10.342		8.919		8.624		-		8.624	Continuing	Continuing	N/A
Remarks													

UNCLASSIFIED

Exhibit R-4, RDT&E Schedule Profile: PB 2020 Air Force	Date: February 2019
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Appropriation/Budget Activity 3600 / 5	R-1 Program Element (Number/Name) PE 0604706F / <i>Life Support Systems</i>	Project (Number/Name) 65412A / <i>Life Support Systems</i>
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	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
Life Support Systems RDTE Efforts																												
IAE [Low Rate Initial Production] Test Assets for IOT&E																												
IAE [Initial Operational Test & Evaluation]																												
IAE [G-Suit Redesign]																												
Advance Concept Ejection Seat (ACES) Qualification Testing																												
Next Generation Ejection Seat Pre-Contract Award Activities																												
Next Generation Ejection Seat Contract Award																												
Next Generation Ejection Seat Qualification Effort																												
Aircrew Performance Aircrew Laser Eye Protection Block 3 Development Award																												
Aircrew Performance Next Generation Fixed Wing Helmet Development Award																												
Continue projects in support of Aircrew Performance																												

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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
<i>Life Support Systems RDTE Efforts</i>				
IAE [Low Rate Initial Production] Test Assets for IOT&E	1	2018	2	2018
IAE [Initial Operational Test & Evaluation]	2	2018	2	2019
IAE [G-Suit Redesign]	3	2019	4	2020
Advance Concept Ejection Seat (ACES) Qualification Testing	1	2018	3	2019
Next Generation Ejection Seat Pre-Contract Award Activities	2	2018	4	2019
Next Generation Ejection Seat Contract Award	1	2020	1	2020
Next Generation Ejection Seat Qualification Effort	1	2020	4	2024
Aircrew Performance Aircrew Laser Eye Protection Block 3 Development Award	2	2019	2	2019
Aircrew Performance Next Generation Fixed Wing Helmet Development Award	3	2019	3	2019
Continue projects in support of Aircrew Performance	1	2018	4	2024