

# *Department of the Air Force*

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*Innovate, Accelerate, Thrive - The Air Force at 75*

## ***AFPEO Agile Combat Support Human Systems Division (HSD) Brief to Industry***



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# Vision & Mission Statements

## Vision:

Save & Improve Airmen's Lives

## Mission:

Acquire & Support Human Systems to Enhance Warfighter Performance,  
Protection & Survivability



***Every Airman...Every Mission...Every Day!***



# Human Systems Division Leadership Org Chart



**Senior Material Leader/  
Division Chief**  
Mr. David McCain

**Deputy Division Chief**  
Col (Sel) John "Will"  
Southard

## Legend

WPAFB

Robins AFB

Aberdeen, MD

DLA, Philly

Natick, MA

Ft Belvoir, VA

**Chief Enlisted Advisor  
AFE SME**  
CMSgt Juan Carlos  
Cueto

**Chief of Engineering**  
Mr. Andrew Klein

**Chief of Contracting**  
Mr. Michael Hill

**Chief Financial Officer**  
Ms. Deanna Gonet

**Chief of Logistics (PSM)**  
Ms. Mary Kicklighter

**Aeromedical Branch  
Chief**  
Mr. Cole Hutchison

**Aircrew Performance  
Branch Chief**  
Mr. Jason Scott

**CBRN Defense  
Systems Branch Chief**  
Col (Sel) Paul "Jimi"  
Hendrickson

**Combat Ready Airman  
Branch Chief**  
Lt Col Joseph Nichols

**Egress & Survival  
Branch Chief**  
Maj Robert Hoggard

**Sustainment Branch  
Chief**  
Ms. Mary Kicklighter



# Human Systems at a Glance

## 6 Branches

AeroMed Branch	Aircrew Performance Branch	Chemical, Biological, Radiological, Nuclear (CBRN) Defense Systems Branch	Combat Ready Airman (CRA) Branch	Egress & Survival Branch	Sustainment Branch
Mr. Hutchison	Mr. Scott	Lt Col Hendrickson	Lt Col Nichols	Maj Hoggard	Ms. Kicklighter
<div><div><u>Projects</u> PLS, Vascular Shunt, EVAC, SIT-D, Three9 Assays, AVT, J-MCIP, CLC, APRU</div><div><u>Labs</u> AT Lab LSE Lab M&amp;T Lab AA Lab LSS/STAG Lab (supporting OBOGS)</div></div>	<div><div><u>Helmets</u> ABH, NGFWH, Legacy Helmets</div><div><u>Suit</u> IAE, CWAS, G-Suits, Anti-exposure, A2CU Flt Suit, Heated Flt Clothing</div><div><u>Accessory</u> ALEP TI, NFB, PLZT, NVG, DEP, Nuclear Flash Blindness</div><div><u>Accessory</u> Body Armor, Boots/ Gloves, Bladder Relief, DIU PPM/WS, STOPS, Survival Vest</div></div>	<div>HCA for Covid-19 Passengers JUON</div> <div>JPEO JPMs/JPLs Medical Protection Rad/Nuc Defense Sensors, Special Ops Efforts: AF Interest Protection: Percutaneous/ Respiratory/ Collective/ Chem/Bio Detection/ Warning/Reporting Contamination Mit. Medical: Vac; Treat; Diagnostic</div>	<div>Physical Training Gear, Female Fitment, Female Body Armor, Gear Fit App</div> <div>AF Uniform Office, Service Dress, Service Dress Shirt/ Coat, Maternity Airman ABU, A2CU-F, Manikin Girdle, FR Product List, US Space Force Uniform, Exoskeletons</div>	<div><u>Seats</u> B-2 SSIP, NGES, T-38 ESUP, ACES II, B-52 Seat container, Seat cushion</div> <div><u>Gear</u> Seat Survival Kit, NCSR, Covert signaling, SEARS, IPLD</div> <div><u>Parachutes</u> LPP BA-X, Harnesses, Drag Chutes</div> <div><u>Flotation</u> LPU, Life Rafts</div>	<div><u>WML Programs</u> AFE CBRN Def Sys PS&amp;RE:NVG</div> <div>1800+ Items Maintained 652 Technical Orders</div> <div><u>Supports Domains:</u> Egress Survival Head Gear Body Wear CBRN Combat Ready Airman</div>

8 Domains	Aeromedical Labs		Head Gear (neck up)	Body Wear (neck down)	Chemical, Biological, Radiological, Nuclear	Combat Ready Airman	Clothing & Textiles	Egress	Survival







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# 2022 Acquisitions Priorities

<u>2022</u>	<u>Initiative</u>	<u>Acq Domain</u>	<u>Lead Command</u>
1	Relief Systems	Body Wear	ACC
2	Aircrew Laser Eye Protection (ALEP) Block III	Head Gear	ACC
3	CNU-129/P Survival Kit Replacement	Survival	AFGSC
4	Aircrew Flight Equipment (AFE) Tester Buy	Head Gear (WNUS)	ACC
5	PLZT Modernization	Head Gear (WNUS)	AFGSC
6	BA Parachute Replacement (B-52)	Survival	AFGSC
7	Integrated Aircrew Ensemble Ejection	Body Wear	ACC
8	Fixed Wing Helmet Upgrade	Head Gear	ACC
9	MARBLES (Harness/Lumbar/Seat Cushion)	Body Wear	ACC
10	Aircrew Body Armor	Body Wear	ACC/AMC/ AFSOC
11	Physiological/Performance Monitoring/Warning System	Body Wear	ACC/ANG/AETC



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# 2022 Acquisitions Priorities continued

<u>2022</u>	<u>Initiative</u>	<u>Acq Domain</u>	<u>Lead Command</u>
12	Alternative Night Vision Goggle Mounting Solutions	Head Gear	ACC
13	Heated Flight Clothing	Body Wear	AFGSC/ PACAF
14	GearFit	ALL	ACC
15	Night Vision Goggle High-FOM Enduring Capability	Head Gear	ACC
16	Aircrew Ballistic Helmet w/ Accessory Rail Connectors	Head Gear	ACC
17	Integrated Personnel Lowering Device (IPLD)	Survival	AFGSC
18	SEA Egress Air Refill Station	Egress	ACC
19	Isolated Personnel Survival Aircrew Flight Equipment	Survival	ACC
20	Isolated Personnel Survival AFE Signaling Communication	Survival	ACC
21	Night Vision Goggle (NVG) Tester Upgrade	Head Gear (WNUS)	ACC
Watch	Aircrew Additional Lighting	Head Gear	ACC



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# 2022 Sustainment Priorities

<u>2022</u>	<u>Initiative</u>	<u>Sustainment Domain</u>	<u>Lead Command</u>
1	Scott 358 V4/V5 Fix	Head Gear	AMC
2	Aircrew Flight Equipment (AFE) Tester Repair	Head Gear	ACC
3	CNU-129/P Survival Kit Sustainment	Survival	AFGSC
4	T-38A/B ESUP Seat / Parachute System Upgrade	Egress	AETC
5	BA-21 Parachute Procurement	Parachute	AFGSC
6	T11R Single Pin	Parachute	AFSOC
7	Aircrew Regulator/Connector Modernization (Includes: CRU-120/122/all other AF approved regulators and connectors)	Head Gear	ACC
8	PCU-15/P and PCU-16/P Technical Data Package (TDP)	Parachute	ACC
9	Advanced Crew Tether System (ACTS)	Survival	AFGSC
10	Night Vision Goggle (NVG) Tester Repair	Head Gear	ACC





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# 2022 Sustainment Priorities continued

<u>2022</u>	<u>Initiative</u>	<u>Sustainment Domain</u>	<u>Lead Command</u>
11	Personal Breathing Equipment (PBE)	Head Gear	AMC
12	F-2B Raft Obsolescence	Survival	AMC
13	HGU-56/P Helmet Camera	Head Gear	AFMC
14	HGU-55/P 3D Audio Mod	Head Gear	ACC (A-10 SPO)
15	Digital Eyepiece Joint Helmet Mounted Cueing System (Wright Patt Transition Plan)	Head Gear	ACC
16	Peacetime Radio Replacement	Survival	ACC
17	Helmet Wraps	Head Gear	ACC



# 2022 CBRN Priorities

<u>2022</u>	<u>Initiative</u>	<u>Lead Command</u>
1	Next Generation Aircrew Protective Ensemble (NGAPE)	ACC
2	Next Generation Nuclear Flash Blindness Protection (NFBP)	AFGSC
3	Uniform Integrated Protective Ensemble (UIPE) Air	ACC
4	Joint Strategic Aircrew Mask (JSAM) Family of Systems	ACC
5	Uniform Integrated Protective Ensemble (UIPE) Aircrew Glove	ACC
6	Through Suit Connector Relief System	ACC
Watch	Chemical and Biological Hydration System	ACC



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# *On the Horizon...*



- IPSAFE-Signaling Communication
- Modular Aircrew Restraint Back and Leg Support
- Try Decide Buy
- Extreme Cold Operation Clothing System
- Future Wearables
- Heated Flight Clothing for Aircrew



# IPSAFE-Signaling Communication

## Overview

### Description:

- Capability for isolated personnel to indicate position to friendly forces w/o being detected by opposing forces in a highly contested/near-peer environment

### Programmatics:

- Currently validating requirements
- Not funded
- Potential partnership with Navy

### Constraints:

- 2-week minimum battery life
- Seat survival kit weight/volume limits

### Tradespace

### Opportunities:

- LPI starting point, LPE + LPI the goal
- Does not have to be one device; minimal items ideal
- Lower powered emitters acceptable
- Wearable device acceptable

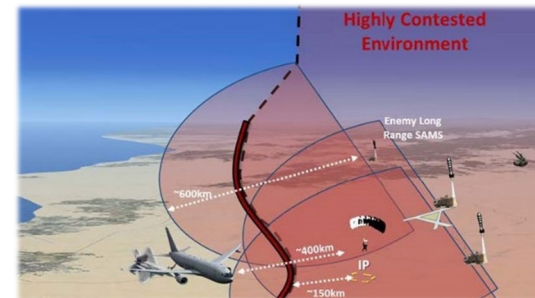
## Requirements

### Initial:

- Persistent worldwide reporting and on-demand location
- Transmit a secure/discrete distress signal in GPS-denied environment
- Supported by existing USG-owned, spaceborne communication pathways
- Update position in LPI/LPE mode every 20 minutes within 10-meter accuracy

### Future:

- Signal across multiple spectra and visible to friendly airborne/spaceborne assets
- Modernize existing infrared/visual signals to increase performance and reduce size
- Add a passive reflective marker /tag that is visible day and night by friendly forces within 20 NM





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# Modular Aircrew Restraint Back and Leg Support

## Overview

### Description:

- Modify or Replace the existing torso harnesses, lumbar pads, and seat cushions utilized by USAF aircrew who fly aircraft equipped with ACES ejection seats to increase safety, improve comfort, and reduce long-term injury

### Programmatics:

- Currently validating requirements
- Not funded
- In coordination with the Female Fitment effort

## Tradespace

### Constraints:

- Ejection seat sled testing required
- Meet MIL-STD-810G requirements

### Opportunities:

- Possible to deliver elements of support system when ready (separately), but integration is paramount
- Encouraged to utilize existing test programs, or modeling, to minimize program cost/schedule

## Requirements

- Perform as well as, or better than, legacy systems during ejection
- Accommodate aircrew nude weight from 103 lbs to 245lbs
- Accommodate aircrew throughout the multivariate anthropometric JSF Cases 1-8
- Reduce chronic injury to aircrew
- Improve aircrew comfort
- Not increase training requirements for Maintainers
- Not restrict movement to perform mission nor impede aircrew interaction with cockpit
- Integrate with bladder relief systems
- Integrate with currently qualified parachutes
- Seat cushion a form, fit, function replacement of original seat cushion







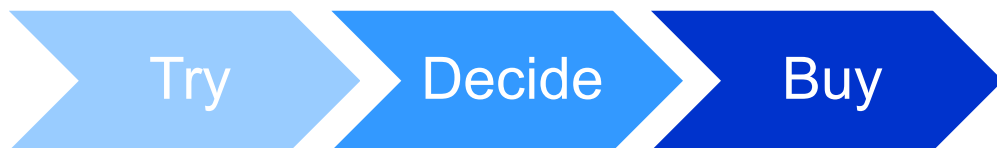
# Try-Decide-Buy (TDB)



## Overview

- **Program Type:** IDIQ Contract – Ceiling \$950M
- **Description:** TDB is a contract vehicle which provides the Govt. the ability to rapidly procure, assess, and evaluate commercial off-the-shelf items in order to support larger follow-on procurements.
- **Period of Performance:** 12 Aug 19 – 11 Aug 29
- **Users:** Armed Forces

## Methodology



- **Try** - Make small purchase of items to test
- **Decide** - Introduce to using community for evaluation of items
- **Buy** - Submit follow-on delivery order for larger purchase to fulfill user needs

## Current Programs

- **Security Forces Female Body Armor**
  - Contract Status: Awarded 31 Mar 20 -- Complete
  - TDB Phase: “Buy”
- **Sensors for T-6 Oxygen & Physiological Systems (STOPS)**
  - Contract Status: Awarded 29 Sep 20; Mod 30 Sep 21
  - TDB Phase: “Try”
- **ACC Survival Kits**
  - Contract Status: Awarded 29 Sep 21
  - TDB Phase: “Try”

## Vendors

- ADS, Inc.
- Baker and Associates, Inc.
- Capewell Aerial Systems, LLC
- Federal Resources
- Hurricane Aerospace Solutions, Inc.
- Life Support International, Inc.
- Mountain Horse Solutions
- Nightline, Inc.
- Rapid Response Defense Systems (RRDS)
- Sera Star, LLC
- Tactical and Survival Specialties (TSSi)



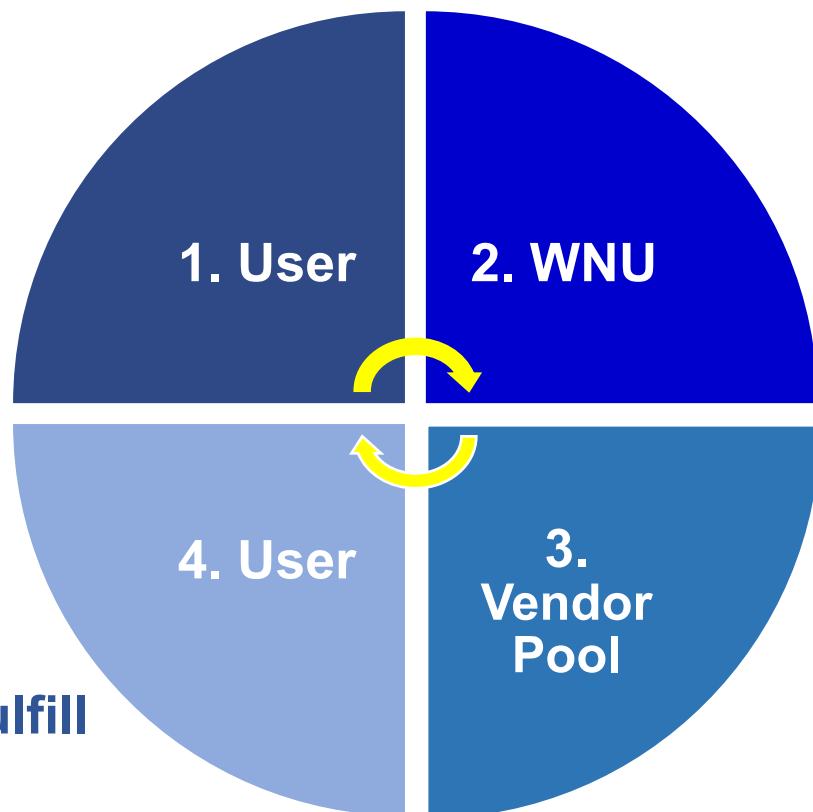
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# TDB Process



- Submits needs to WNU
- Defines requirements

- Delivery of items
- Try out items
- Decide if needs are met
- Buy larger quantities to fulfill fielding requirements



- Confirm requirements are within scope of TDB
- Releases FOPR to Vendor Pool

- Provides competitive price for items
- Best Value Determination (LPTA or Trade Off)
- Meets delivery schedule



# TDB NAICS Codes



Users' requirements must be commercial off-the-shelf (COTS) and fall within the following NAICS codes to use the TDB program.

NAICS Code	Description
314999	All Other miscellaneous Textile Product Mills
315280	Cut and Sew Apparel Contractors
315990	Apparel Accessories and other Apparel Manufacturing
316998	All other leather Good and Allied Product Manufacturing
326199	All Other Plastics Product Manufacturing
326299	All Other Rubber Product Manufacturing
333314	Optical Instrument and Lens Manufacturing
334220	Radio and TV broadcasting & Wireless Communications Equipment Manufacturing
334290	Other Communications Equipment Manufacturing
336413	Other Aircraft Parts & Auxiliary Equipment Manufacturing
339113	Surgical Appliance and Supplies Manufacturing



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# Extreme Cold Operation Clothing System



## Overview

### Description:

- Develop a modular, tailorable, scalable environmental clothing ensemble that provides protection from extreme cold weather temperatures (-60F) and winds while providing the hazard protection while performing specific duties and potential survival situations for both ground and aircrew personnel

### Programmatics:

- New Start in FY23

## Tradespace

### Constraints:

- Personnel must remain combat effective while wearing increased layers

### Opportunities:

- Potential multi-Service collaboration to meet commonality initiatives

## Requirements

- Head-to-toe garment system that shall provide environmental protection in the polar/artic environment
- Components shall be configurable so they may or may not be worn together and provide the ability to be tailored for mission sets in all intended environments
- Shall be fully integrated with minimal or no detrimental impacts to mobility and maneuverability of the wearer with no degradation to the Airmen's ability to perform mission essential duties and survive.





# Future Wearables

## Overview

### Description:

Develop an in-flight physiological system to record, monitor, and alert aircrew to unexplained physiological events in human performance.

### Programmatics:

- Currently validating requirements
- Not funded
- In coordination with DIU/ACC/AFRL/Navy

## Tradespace

### Constraints:

- Funding
- Alert Effectivity
- Pilot Training & Buy-In

### Opportunities:

- Open-Architecture environment will provide opportunity for future emerging technologies

## Requirements

- Detect and alert aircrew in real time to symptoms of hypo/hyperoxia
- Detect and alert aircrew in real time to symptoms of hypo/hypercapnia
- Measure head level oxygen delivery and perfusion and alert aircrew if it reaches dangerous levels
- Calculate inhalation/exhalation work of breathing







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# Wearables “Big Picture”

## “Human Performance” Database

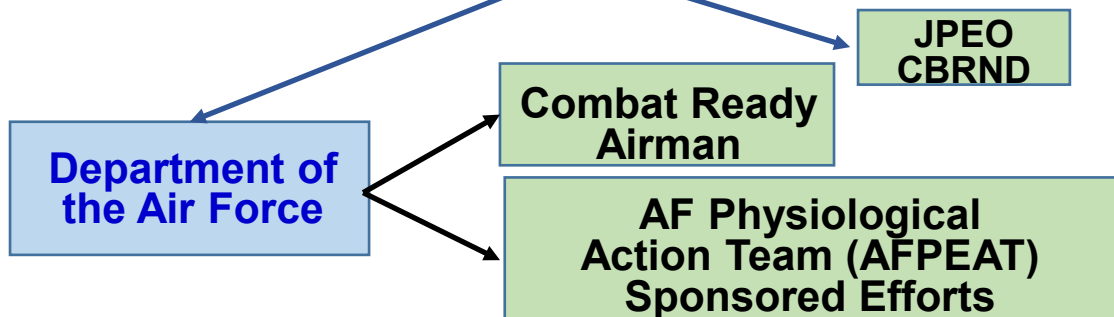
Common database that will turn data collected from the wearables into human performance data that can be used to provide real-time information that enhances readiness

## Software Tool

This tool that will be able to translate the data coming from any wearable device into a single standard data format that can be entered into the “Human Performance” Database

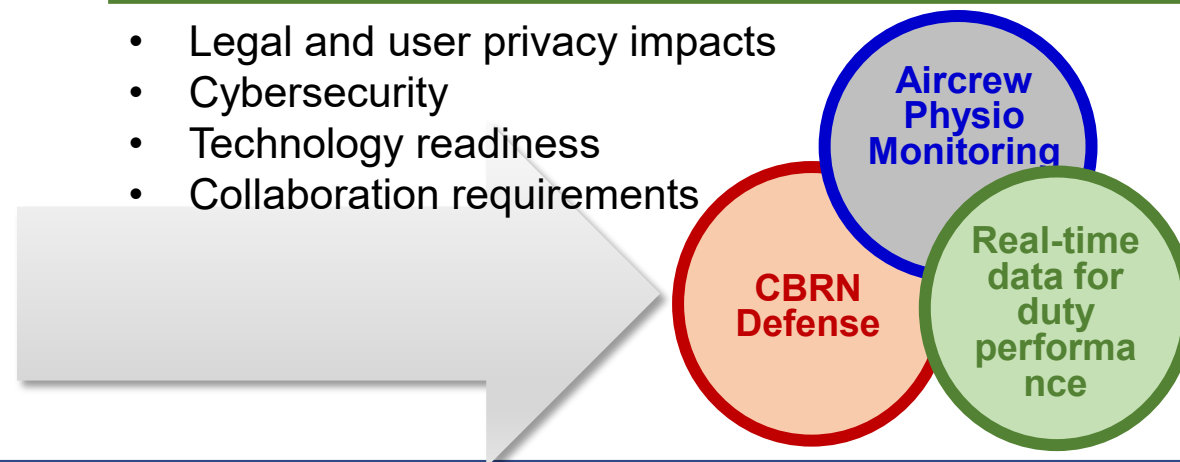
## Department of Defense

The Services are moving forward to gain an understanding of joint physiological monitoring capabilities



## Solutions Needed

- Detect/alert aircrew in real time to symptoms of hypo/hyperoxia and hypo/hypercapnia
- Measure head level oxygen delivery and perfusion and alert aircrew if it reaches dangerous levels
- Calculate inhalation/exhalation work of breathing
- Early warning for chemical and biological threats
- Joint requirements
- Provide early warning for infection, fatigue, stress and other physiological monitoring capabilities
- Legal and user privacy impacts
- Cybersecurity
- Technology readiness
- Collaboration requirements





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# Heated Flight Clothing for Aircrew

## Overview

**Description:** Provide active heated clothing items (gloves, undergarments, footwear) for aircrew members operating in extreme cold weather environments i.e. rotary aircrew flying with doors open in winter conditions, and gloves for ejection seat aircrew to keep their hands warm under canopy in the event of extreme cold weather ejection

### Programmatics:

- Currently validating requirements
- Not funded
- In coordination with the CRA Branch's ground crew effort

## Tradespace

### Constraints:

- Unfunded at this time
- Power sources – size and weight

### Opportunities:

- Possible to deliver elements of system when ready (separately), but integration is paramount
- Lightweight power source needed

## Requirements

- Various commercial systems work on 12v DC, yet industry and Army projects have been identified to operate on a 24v DC system for direct connect to the aircraft.
- Exposure to temperatures up to -65 F (plus wind chill) is possible and clothing is needed to help maintain core temperature.
- Must be Berry compliant
- Outer layers must be FR, under layers “no melt/no drip”
- Must pass EMI/EMC testing





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# Questions?

