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# **FAA REDAC Human Factors Subcommittee**

## **Findings and Recommendations**

### **Winter/Spring 2022**

**Barbara Holder Ph.D., FRAeS**

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# Winter/Spring Human Factors Subcommittee

**Met virtually: March 29-31, 2022**

## **Reviewed Research Accomplishments and Planned Portfolios FY24+**

### **Flight Deck HF Research, NextGen**

Dr. Victor Quach, FAA Flight Deck NextGen HF Portfolio Manager

### **Flight Deck HF Research, Core**

Dr. Chuck Perala, FAA Flight Deck Core HF Portfolio Manager

### **FAA ATC HF Research, NextGen**

Karl Kaufmann, FAA NextGen Enterprise HF Portfolio Manager

### **FAA ATC HF Research, Core**

Dan Herschler, FAA ATC Core HF Portfolio Manager

# Briefings

**Jarrett Larrow**  
UAS Integration Office

**Tara Gibson**  
FAA NextGen HF Division  
Manager (ANG-C1)

**Dr. Hannah Baumgartner  
& Colleen Donovan**  
AVS HF Specialists



The slide features a blue background with a hexagonal pattern and images of drones. The FAA logo is in the top left. The title 'Jarrett Larrow, AUS-440' is centered, followed by 'BVLOS & UTM Updates' and 'March 31, 2022'. A small inset image of a drone is on the left. The bottom section is titled 'Today's Briefing'.

Federal Aviation  
Administration

Jarrett Larrow, AUS-440  
BVLOS & UTM Updates  
March 31, 2022

Today's Briefing

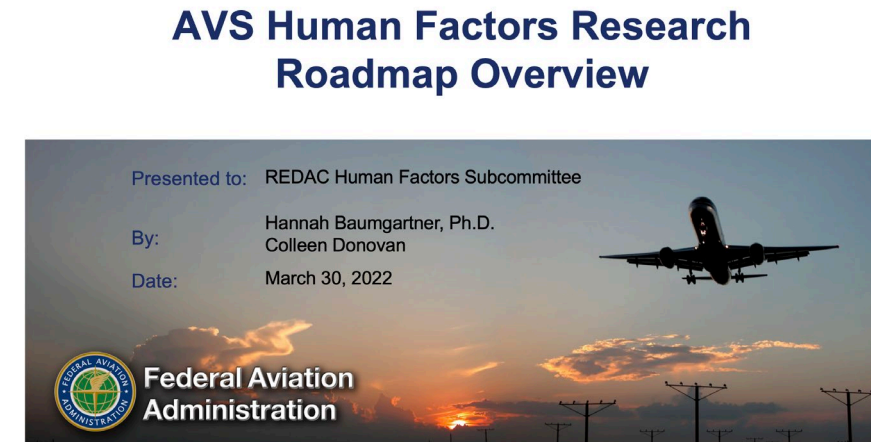
- BVLOS ARC Update
- Human Factors in UTM



The slide features a globe with a network of lines and the text 'INFO-CENTRIC NATIONAL AIRSPACE SYSTEM'. The title 'Charting Aviation's Future Operations' is on the right.

INFO-CENTRIC  
NATIONAL AIRSPACE SYSTEM

Charting  
Aviation's Future  
Operations



The slide features a sunset background with a plane silhouette. The title 'AVS Human Factors Research Roadmap Overview' is at the top. The presentation details are in the center, and the FAA logo is in the bottom left.

AVS Human Factors Research  
Roadmap Overview

Presented to: REDAC Human Factors Subcommittee

By: Hannah Baumgartner, Ph.D.  
Colleen Donovan

Date: March 30, 2022

Federal Aviation  
Administration

# Findings and Recommendations

## **Finding 1: Office of Aviation Safety (AVS) Human Factors (HF) Research Roadmap**

- We were pleased with the briefing on the initiation of the AVS Human Factors Research Roadmap. The effort to date is promising and provides value to the Agency.
- Roadmap is intended to consolidate and catalog the core and NextGen flight deck Human Factors research portfolios.

### **Recommendation:**

- AVS Human Factors Roadmap development should be continued and sent to AVS1 for signature.
- The FAA should develop a similar roadmap that consolidates and catalogs Human Factors research across AVS and the Air Traffic Organization.

# Findings and Recommendations

## **Finding 2: Use of Immersive Technologies for Workforce Training**

- Immersive technologies such as Virtual Reality (VR) and Augmented Reality (AR) have rapidly advanced in recent years and might be useful for developing, maintaining, or regaining certain skills currently exercised in other training devices.
- It is not clear if the FAA has the information needed to provide effective guidance and approval for advanced training technologies.

### **Recommendation:**

- The the FAA should conduct research to explore immersive technologies for training such as VR and AR for developing proficiency, maintaining proficiency, enhancing training, and bringing workers skills back to standard proficiency levels after periods of skill degradation.

## Findings and Recommendations

### **Finding 3: Human Factors Research for Unmanned Aircraft Systems (UAS) Beyond Visual Line of Sight (BVLOS)**

- The UAS BVLOS ARC report illuminated several potential UAS research gaps.
- Standards are needed for UAS control stations to ensure operational safety.
- Current development is being driven by industry. Input from standards organizations (e.g., ASTM and RTCA) may not be incorporating Human Factors considerations sufficiently.
- Human Factors considerations normally addressed in aircraft certification are being moved into the operational approval process, which is new to the FAA.
- Research is needed to inform the development of standards and policy for operational approval.

### **Recommendation:**

- The FAA should leverage past human factors research on manned and unmanned aircraft, including controls and displays, system behavior, and alerting.
- The FAA should define specific new research to establish HF guidance and inform the operational approval of UAS control stations for BVLOS operations.

# Actions

## **Actions from briefings and portfolio reviews:**

1. ATO should develop a Human Factors research roadmap. Briefing requested.
2. Briefing requested on the current and planned efforts to research reduced crew concepts to inform aircraft certification and operational approval.
3. Briefing requested on the completed and planned Electronic Flight Bag research, including how research outputs are being used to inform operational use and approvals.

## **Actions from FAA response to F&Rs from Summer/Fall 2021:**

4. Briefing requested on the potential to conduct naturalistic Human Factors studies that take advantage of opportunities where the FAA will be introducing new automation support for air traffic controllers and traffic managers in the next few years.
5. Briefing requested on planned research that can be used to provide a current scientific and engineering basis to update flight deck alerting systems standards.



Thank You,

