Validate Visual Detection and Avoidance Operations Standards for Small Unmanned Aircraft Systems (sUAS)

Purpose

- Characterize recommendations for visual observer training standards, FAA risk assessments, and waivers for beyond visual line of sight (BVLOS) operations. This research will validate ASTM International standards for visual line of sight and inform guidance for BVLOS operations.

Background

- Recent experience with sUAS flight tests and theoretic assessment of visual limitations have revealed potential challenges and optical illusions that may arise for line of sight operations. Strong optical illusions can occur when two aircraft approach one another, and may negatively impact the decision-making of visual observers (VO) and remote pilots (RP). This can result in UAS avoidance maneuvers that maneuver towards a manned aircraft rather than away from it.
- There is a need to:
  - Evaluate VO/RP performance in maintaining visual separation from crewed aircraft
  - Identify VO training recommendations for daytime, dusk, and nighttime operations
  - Inform VO training beyond visual detection to include avoidance of manned aircraft

Projected Benefit of Research

- Identify VO and RP performance considerations for visual detection and avoidance.
- Explore capacity for VOs and RPs to use visual references for avoidance.
- Identify challenges associated with VO/RP communications.
- Explore capacity for RP to give way to manned aircraft.

Research Approach

- Perform literature review regarding VO/RP performance
- Develop and conduct flight test plans
- Report findings and make recommendations for VO performance and training requirements
- Collect findings, submit final report and conduct peer review

Research Partners

- FAA's Center of Excellence for UAS Research, Alliance for System Safety of UAS through Research Excellence (ASSURE):
  - Kansas State University
  - Wichita State University
  - New Mexico State University
  - Mississippi State University

Status

- **IN PROGRESS**; Period of Performance: FY21-FY23
- Kickoff meeting held April 16, 2021
- Final report expected January 2023

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