

Develop Test Methods and Performance Requirements for Small Unmanned Aircraft Systems (sUAS) Detect and Avoid (DAA) Systems

Purpose

- Establish a testing methodology to evaluate various sUAS DAA systems and sensors. Insights from the tests will provide the FAA with the current state of DAA technology and areas of improvement. The research findings will inform ASTM DAA standards under development.

Background

- The current activity to develop a Minimum Operational Performance Standard (MOPS) for UAS DAA capabilities may result in a technology that is incompatible with sUAS (55 lbs. and below, relatively low speed or stationary, low altitudes). The MOPS will also pose a challenge for sUAS in terms of size, weight, and power requirements. Under the Operation of Unmanned Aircraft Systems Over People final rule, any potential visual line of sight operating limitation will not be compatible with the precision agriculture and geographical mapping sUAS applications that will require greater access to the National Airspace System (NAS) in order to reach their full economic potential.

Projected Benefit of Research

- Expand access for sUAS in limited areas of the NAS and still achieve a level of safety equivalent to manned aircraft operating in a similar manner.
- Determine the operational performance of the DAA systems used for sUAS and help the FAA to determine their level of safety for BVLOS operations.
- Examine Specific Operations Risk Assessment (SORA) and the different levels of safety and see how different levels of DAA systems can help meet the level of safety needed for each SORA risk level.

Research Approach

- Develop an operational framework, including operating constraints, a description of the operating environment, and any assumptions that need to be communicated to other stakeholders for sUAS BVLOS operations
- Conduct a comparison of ground-based and airborne approaches to sUAS DAA and determine whether to develop requirements for both, or only the most feasible approach
- Develop a separation framework including characteristics of the DAA system impact to maintain well clear of manned aircraft and how any unmanned aircraft characteristics will impact remaining well clear
- Develop a test method to determine how well an sUAS DAA system remains well clear of manned aircraft during BVLOS operations
- Develop sample DAA performance levels that coincide with the SORA risk levels for sUAS
- Document findings and submit final report

Research Partners

- FAA's Center of Excellence for UAS Research: Alliance for System Safety of UAS through Research Excellence (ASSURE):
 - New Mexico State University
 - University of North Dakota
 - University of Alaska Fairbanks
 - Kansas State University
 - Mississippi State University
 - Ohio State University

Status

- **COMPLETE**; Period of Performance: FY16-FY22
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