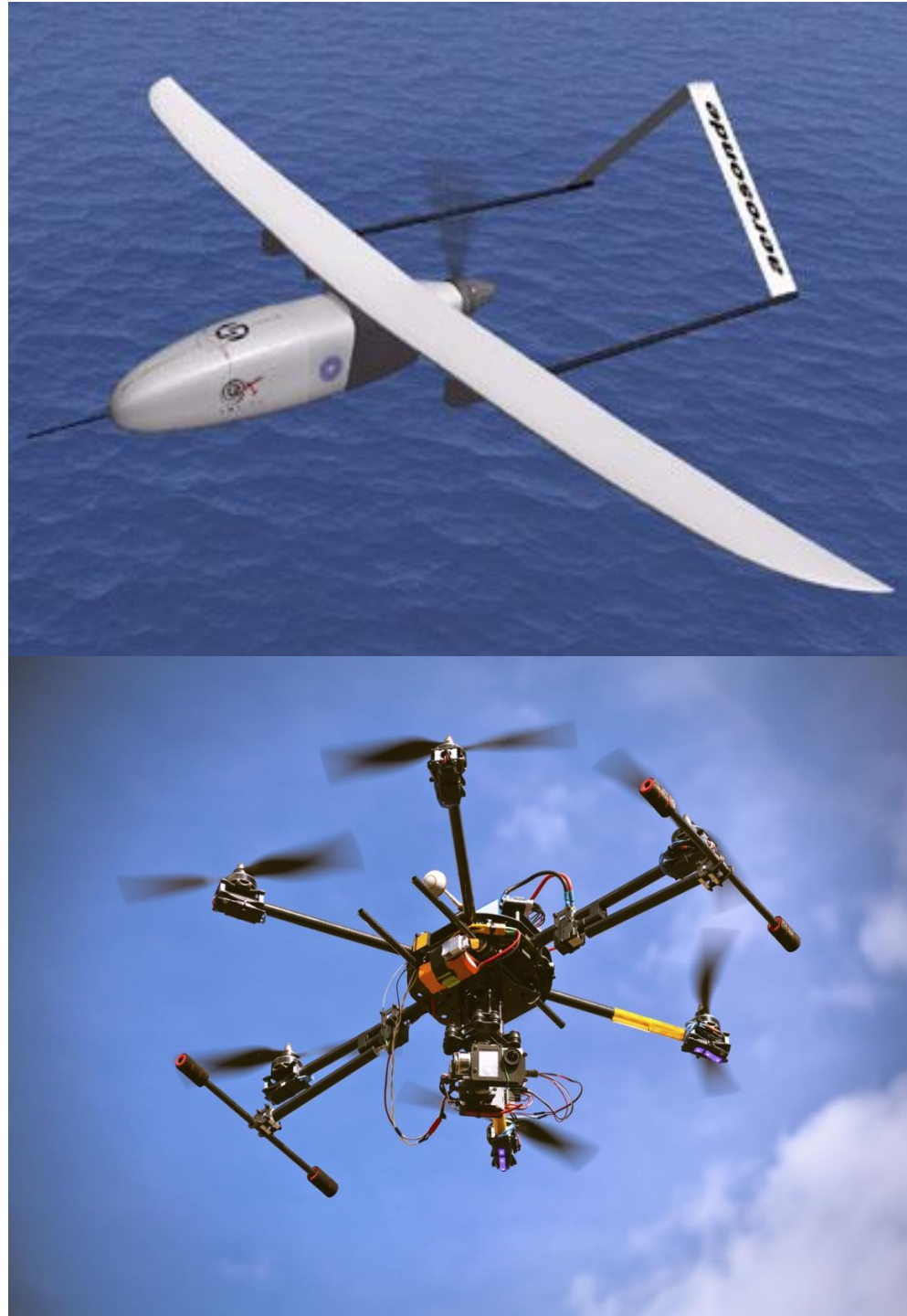


UAS HF Research Roadmap Activities

Presented to: HF REDAC

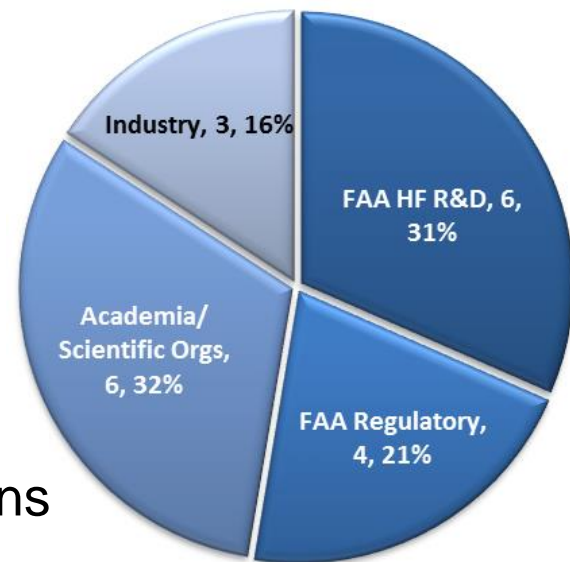
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Date: March 31, 2016



UAS Human Factors Summit

- **Two-day meeting at MMAC to establish a roadmap for UAS human factors research.**
- **The summit was the result of a call to action for collaboration with WJHTC by the MMAC NextGen Integration Committee (ACNIC).**
- **Summit attendees included:**
 - UAS Integration Office and Other FAA Regulatory Representatives
 - FAA HF R&D (CAMI, WJHTC, ANG-C1)
 - Industry Representatives
 - Academia and Other Scientific Organizations (e.g., ASSURE COE, NASA, MITRE)



UAS Human Factors Summit: Purpose



- Engage stakeholders from science, industry, and regulatory agency.
- Review the unique stakeholder issues identified as critical (FAA Reg, FAA HF R&D, Academia/Scientific Orgs, Industry).
- Develop a roadmap prioritizing research needs pertaining to human factors within UAS operations.



UAS Human Factors Summit: Prep

- All attendees were asked to submit their Top UAS HF issues prior to attending meeting.
- The submissions were content analyzed to identify the high-level categories that need to be addressed.
- The high-level categories were used to determine breakout groups for deep-dive identification and prioritization of issues within each category.



Breakout Groups

- **Categories included:**
 - Unique Certification Requirements (including Control of Multiple UAS)
 - Unique Operational Requirements for UAS Missions (such as lost link/off nominal conditions, navigation, and unique visibility requirements)
 - Control Station Design (in terms of DAA displays, limitations of sensory information, automation, etc.)
 - UAS in the NAS (in terms of Crew/NAS interactions, ATC systems and requirements, and latencies)



Post-Summit Assignments

- Each breakout group briefed their prioritized research issues to the attendees.
- Research issues were discussed and explained from the different perspectives.
- Attendees agreed that the work was not over, the issues would be compiled and distributed to the group for final ranking to develop the roadmap.



Survey of Research Issues

- **In February, the complete list of research issues was sent to summit participants.**
- **Responders rated each research issue on three factors: Importance, Urgency, and Impact.**
 - Importance was rated (High, Medium, Low) in terms of safety and efficiency of UAS operations and the implications for the general public.
 - Urgency was rated (Now, 2-3 Yrs, 4+ Yrs) by indicating when this research needed to begin.
 - The type of impact respondents expected to result from addressing each research issue was identified (FAA Regulations, FAA Policy/Guidelines, Industry Standards, Other, None).



Top Research Issues

- **An overall score was calculated using reported Importance and Urgency.**
- **A proceedings report summarizing the findings is under development.**
- **A couple of example issues include:**
 - Identify requirements for supporting the UAS pilot-in-command during UAS contingency operations including requirements for control station displays, automation, training, and procedural requirements.
 - Identify requirements for supporting the Air Traffic Controllers during UAS contingency operations including requirements for ATC displays, automation, training, and procedural requirements.



Survey of Research Issues

- **These ratings will be used to define the research roadmap by providing a quantitative way to prioritize the research issues to be both informative and actionable.**
- **This roadmap will provide the FAA with a foundation for the development of a HF UAS research plan that addresses the identified gaps.**

