Autonomous Aerial Cargo/Utility System (AACUS) INP

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Code 35
**Need:** USMC Cargo UAS to rapidly support distributed forces, as an alternative to convoys, manned aircraft and air drops in all-weather, possibly hostile conditions.

**Goal:** Autonomous approaches & landings for unprepared landing sites, supervised by field operators with no special training, & integration across a variety of unmanned rotorcraft.

**Challenges:**
- Unprepared landing site selection and execution
- Dynamic contingency replanning until the point of landing
- A supervisory control system that any USMC personnel can operate
- Cultural attitudes
- Industry proprietary SW architecture

**Proposed Deliverables**
- Compact, modular low cost sensor suite
- Precision ops with no specially trained operator to include obstacle avoidance and unprepared site landings & recovery in DVE/ GPS denied settings
- Reliable critical cargo delivery
  - Long term focus on CASEVAC missions
- Flight demonstrations
Key AACUS Discriminators

• AACUS focuses on landing site selection AND real-time execution
  • Global (mission-centered) vs. local (vehicle-centered) control
  • Dynamic threat response and contingency planning

• ICUAS is a near-term logistics program, focused on prepared site landing with trained UAV operators.
  • Internal vs. sling load capacity

• MRMP/MRMUAS/Firescout are ISR programs
  • AACUS could complement these programs as well as manned platforms

• CASEVAC missions
  • Cargo missions more near term, medical missions more long term
  • Represent a major leap in trust and acceptance
    • Could potentially transform civilian applications

• Field personnel should be able to operate with no special training
  • Call for support under duress
  • Medics on board as a future option
• Mission-centered Global Open Architecture Layer (GOAL) vs. local flight control algorithms
  - Open architecture vs. proprietary
  - The fallacy of plug and play
  - Feed forward vs. feed back of sensed data
  - The cost-benefit analysis deliverable
The Tentative Plan

• Industry workshop
  • Goal is for industry, academia, and government labs & centers (UAV & UGV, platform & sensor) to understand the capabilities of one another
  • Establishing basis for team formations for potential BAA release
    • Team composition
    • Single vs. multiple awards
  • Questions today and tomorrow
    • More questions until 23 NOV
    • Updated CONOPS to be posted soon

• ~ 1 DEC BAA release
  • Two unique VTOL platforms with a common sensor package and three human-vehicle interfaces, using an open architecture framework
    • Must demonstrate portability across both platforms
    • Unmanned vs. optionally manned platform
  • Important Dates
    • 13 JAN 2012 BAA deadline
    • late FEB Source selection
    • APR 2012: Contracts issued pending signing of appropriation bill
Programmatics

• Initial contract expected to be for two years, with three option periods that align with Demos 2, 3 & 4
• Budget of ~$5M for the first fiscal year, and ~$13M per follow-on years
• STTR/SBIR future possibilities

• Transition opportunities at major milestones
  • To other UAS programs as well as manned programs
  • Commercial and other government agencies

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• Final Review

● = Annual Reviews
Questions?