NASA SBIR 2010 Phase I Solicitation

A1.05 Crew Systems Technologies for Improved Aviation Safety

Lead Center: LaRC

NASA seeks proposals that will improve aerospace system safety through: the development of highly innovative, crew-centered, technologies that result in effective joint human-automation systems; and improved methods for evaluating such systems in the context of NextGen operations.

We seek proposals for the development of advanced technologies that:

- Effectively convey information and aid decisions which support novel NextGen operational requirements (e.g., 4D trajectory-based operations, visual operations in non-visual meteorological conditions, etc. as described in http://www.faa.gov/about/initiatives/nextgen/media/NGIP_0130.pdf);
- Foster the appropriate use of automation and complex information sources by, for example, conveying constraints on automation reliability and information certainty/timeliness;
- Support effective joint cognitive systems by improving the communication and collaboration among multiple intelligent agents (human and automated, proximal and remote);
- Characterize the operational status of the human crewmembers, effectively modulate this state, and/or effectively adapt interfaces and automation in response to functional status (e.g., situationally-aware display reconfiguration, aiding, and multi-modal presentation of information to maximize system performance and minimize information processing bottlenecks).

We also seek proposals with novel approaches to evaluating joint human-automation systems, particularly with adaptive automation, to assess team (human and automated agents), and system performance and reliability.

Proposals should describe novel technologies and evaluation tools with high potential to serve the objectives of the Operator Performance (http://www.aeronautics.nasa.gov/avsafe/iifd/op.htm) and Operator Characterization (http://www.aeronautics.nasa.gov/avsafe/iifd/ocm.htm) and/or Multimodal Interfaces (http://www.aeronautics.nasa.gov/avsafe/iifd/mmi.htm) elements of NASA's Aviation Safety Integrated Intelligent Flight Deck program (http://www.aeronautics.nasa.gov/avsafe/iifd/index.htm). Successful Phase I proposals should culminate in a final report that specifies, and a Phase II proposal that would realize, technology that improves the
effectiveness of joint human-automation systems in aviation, or improves the ability to assess the effectiveness and reliability of such systems.