NASA SBIR 2012 Phase I Solicitation

A1.03 Flight Deck Interface Technologies for NextGen

Lead Center: LaRC

Public benefits derived from continued growth in the transport of passengers and cargo are dependent on the improvement of the intrinsic safety attributes of current and future air vehicles that will operate in NextGen. The Aviation Safety Program (AvSP) is addressing this challenge by conducting cutting-edge fundamental and applied research that will yield innovative algorithms, tools, concepts and technologies from the discipline level up to the subsystem and system level. As a part of the AvSP, the Vehicle System Safety Technology (VSST) Project has initiated a Technical Challenge (TC) toward the improvement of Crew Decision-Making and response in complex situations (CDM), in current-day and NextGen operations.

To address this TC, NASA seeks innovative flight deck interface research and technology that address the following major topic areas:

- The flight crew's needs for situation awareness/information in current-day and emerging NextGen operations. Research and technology development focused on novel display technologies and display methods that allow for new means of NextGen information portrayal and creating visual and aural interface methods to provide hazard and aircraft state awareness and protection during terminal maneuvering area operations.

- The development of flight deck interface technologies that assure pilot awareness and appropriate engagement (balancing awareness and workload) in current-day and emerging NextGen operations. Research and technology development to proactively address the potential impact of changing roles and responsibilities between the Air Navigation Services Providers (ANSP) and pilots as well as between the human and automation, and the robustness of these interfaces when responding to unexpected events.

- Integrated information management systems that assure the information needed by flight crews to make critical decisions is complete and not misleading. Research and technology development to better manage flight deck information during NextGen "Net-Centric" operations without overloading or underwhelming the operators/users.

- Understanding demographics and proficiency that impact human (pilot) decision-making. Research and technology development which addresses emerging pilot demographics and pilot proficiency standards to improve pilot decision-making and interactions with other human and automation