



NASA SBIR 2011 Phase I Solicitation

A1.20 Verification and Validation of Flight-Critical Systems

Lead Center: ARC

Participating Center(s): AFRC, LaRC

The Aviation Safety program has been put in charge of addressing the JPDO concerns that current V&V techniques are not sufficient to verify and validate NextGen. This is reflected in the VVFC element under the SSAT project in the Aviation Safety program.

VVFC has four major themes:

- Argument-based safety assurance, which aims at unifying and formalizing how V&V results for ground and airborne software systems are folded into a safety argument for certification.
- Distributed Systems, which aims at developing guidance on the V&V of distributed applications, e.g., communication topologies, mixed-criticality architectures, and fault tolerance schemes.
- Authority and Autonomy, which explores the modeling and analysis of authority problems in the NAS when viewed as a distributed system within which automation and humans interact.
- Software-intensive systems, which focuses on early, formal methods for the V&V of software systems.

This year, VVFC is interested in technologies that can be transitioned (meaning that tools are made available) to industry in the following areas:

- Run-time monitoring.
- Safety case.
- Static analysis.

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- Code libraries implementing fundamental technologies that can be used in formal method research, such as:
 - Memory and time efficient decision procedures.
 - Memory and time efficient abstractions for static analysis.