NASA SBIR 2005 Phase I Solicitation

S2.07  Risk Modeling and Analysis

Lead Center: JPL

Participating Center(s): LaRC

The purpose of this subtopic is to advance the state-of-the-art in risk modeling and analysis, particularly for use in early design (formulation) phases. Of particular interest would be methods for risk characterization and modeling that extend beyond typical technical aspects, including software, programmatic, operations, organization, and management elements. This subtopic includes tools and methods, visualization techniques, and process enhancements. Technical areas to address include:

- Uncertainty modeling including both epistemic and aleatory uncertainties;
- Attribute-driven risk identification;
- Risk reduction modeling that includes both preventative and mitigative activities;
- Methods for aggregation and/or integration of quantitative and qualitative risks;
- Methods for characterization and integration of software, organizational, operations, and other non-physics based risks;
- Integration of risks and risk insights into the trade and formal design processes, including new techniques for risk visualization and new methods for directly trading risk against other design aspects;
- Development of risk model library elements and techniques for selecting, maintaining, and integrating the elements;
- Methods for cost-effective adaptation and utilization of PRA and other probabilistic methods in early design (e.g., conceptual design) which can be integrated directly into the design process (i.e., can be utilized directly by the system designers without additional analyst support); and
- Methods for risk-based margin determination and management.