

Name(s):	Shirley Savarino
Title(s):	Chief Engineer, NASA IV&V Services Contract
Company/ Organization	TASC
Name:	
Paper Title:	Fault Management Architectures and the Challenges of Providing Software Assurance
	<p>The satellite systems Fault Management (FM) is focused on safety, the preservation of assets, and maintaining the desired functionality of the system. How FM is implemented varies among missions. Common to most is system complexity due to a need to establish a multi-dimensional structure across hardware, software and operations. This structure is necessary to identify and respond to system faults, mitigate technical risks and ensure operational continuity. These architecture, implementation and software assurance efforts increase with mission complexity. Because FM is a systems engineering discipline with a distributed implementation, providing efficient and effective verification and validation (V&V) is challenging. A breakout session at the 2012 NASA Independent Verification & Validation (IV&V) Annual Workshop titled ""V&V of Fault Management: Challenges and Successes"" exposed these issues in terms of V&V for a representative set of architectures.</p>
Abstract:	<p>NASA IV&V is funded by NASA's Software Assurance Research Program (SARP) in partnership with NASA's Jet Propulsion Laboratory (JPL) to extend the work performed at the Workshop session. NASA IV&V will extract FM architectures across the IV&V portfolio and evaluate the data set for robustness, assess visibility for validation and test, and define software assurance methods that could be applied to the various architectures and designs. This work focuses efforts on FM architectures from critical and complex projects within NASA. The identification of particular FM architectures, visibility, and associated V&V/IV&V techniques provides a data set that can enable higher assurance that a satellite system will adequately detect and respond to adverse conditions.</p> <p>Ultimately, results from this activity will be incorporated into the NASA Fault Management Handbook providing dissemination across NASA, other agencies and the satellite community. This paper discusses the approach taken to perform the evaluations and preliminary findings from the research including identification of FM architectures, visibility observations, and methods utilized for V&V/IV&V.</p>