Abstract for Flight Software Workshop – 2016

Title: SLS Flight Software Testing: Using a Modified Agile Software Testing Approach

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NASA's Space Launch System (SLS) is an advanced launch vehicle for a new era of exploration beyond earth's orbit (BEO). The world's most powerful rocket, SLS, will launch crews of up to four astronauts in the agency's Orion spacecraft on missions to explore multiple deep-space destinations. Boeing is developing the SLS core stage, including the avionics that will control vehicle during flight. The core stage will be built at NASA's Michoud Assembly Facility (MAF) in New Orleans, LA using state-of-the-art manufacturing equipment. At the same time, the rocket's avionics computer software is being developed here at Marshall Space Flight Center in Huntsville, AL. At Marshall, the Flight and Ground Software division provides comprehensive engineering expertise for development of flight and ground software. Within that division, the Software Systems Engineering Branch's test and verification (T&V) team uses an agile test approach in testing and verification of software.

The agile software test method opens the door for regular short sprint release cycles. The idea or basic premise behind the concept of agile software development and testing is that it is iterative and developed incrementally. Agile testing has an iterative development methodology where requirements and solutions evolve through collaboration between cross-functional teams. With testing and development done incrementally, this allows for increased features and enhanced value for releases. This value can be seen throughout the T&V team processes that are documented in various work instructions within the branch. The T&V team produces procedural test results at a higher rate, resolves issues found in software with designers at an earlier stage versus at a later release, and team members gain increased knowledge of the system architecture by interfacing with designers. SLS Flight Software teams want to continue uncovering better ways of developing software in an efficient and project beneficial manner. Through agile testing, there has been increased value through individuals and interactions over processes and tools, improved customer collaboration, and improved responsiveness to changes through controlled planning. The presentation will describe agile testing methodology as taken with the SLS FSW Test and Verification team at Marshall Space Flight Center.