

## Software Engineering Technologies Presented at 09/23/2003 ViTS and Resulting FY04 Collaborations

- C Global Surveyor (Code IC, IS) → *Static analysis defect detection tool: ARC (ISS payload) and MSFC (ISS payload)*
- Perspective-based Inspections (Fraunhofer, SARP) → *Software inspection methodology: GSFC (Spacecraft FSW) and USA (ISS power analyzer)*
- Orthogonal Defect Classification (JPL, SARP) → *Process improvement methodology: JPL (DSN antenna controller)*
- Code Surfer (Grammatech, Inc.) → *Reverse engineering/debugging toolset: JSC (ISS, Shuttle)*
- Coverity SWAT (Coverity, Inc.) → *Static analysis defect detection tool: MSFC (ISS, Shuttle FSW)*

## Software Engineering Technologies Presented at 05/18/2004 ViTS for FY05 Collaborations

- MATT (Univ. Montana, NASA SARP) → *Testing Matlab models*
- FLUID (CMU, NASA ECS) → *Java code analysis*
- SCR (Naval Research Lab) → *Requirements analysis tools: ARC (ISS Payload)*
- SpecTRM (Safeware Corp.) → *Requirements capture and analysis tool: JPL (Spacecraft design rationale capture)*
- Software Architecture Evaluation (Fraunhofer) → *Code/architecture consistency checking*
- DesignAdvisor & TDE (Siemens) → *UML style and testing tools: GSFC (Space telescope science instrument module)*
- Code Surfer (Grammatech) → *Reverse engineering/debugging toolset: IVVF (Spacecraft FSW)*



# Infusion of Software Engineering Research

- **POC:** Tom Pressburger (Robust Software Engineering (RSE) Group, Code TI, [tom.pressburger@nasa.gov](mailto:tom.pressburger@nasa.gov))  
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- **Funding:** Office of the Chief Engineer and Office of Safety and Mission Assurance's Software Assurance Research Program (OSMA SARP)
- **Background:** The goal of the NASA Software Engineering Initiative, led by the Office of the Chief Engineer, is to improve NASA software engineering to meet the challenges of NASA. One of the Initiative's objectives is to infuse software engineering research results into NASA practice. The Research Infusion subgroup of the intercenter Software Working Group is being led by Tom Pressburger and has focused on getting NASA-sponsored software engineering research and leading edge commercial tools used on NASA software projects. The subgroup has members from Ames, Goddard, the IV&V facility, JPL, Langley, and Marshall. The approach is to select research, publicize it across NASA in a ViTS (a video teleconference presentation), and initiate pilot projects, with funding from OSMA SARP, that deploy the research on NASA software development projects. The pilot projects are selected on the basis of proposals submitted by software developers. A ViTS was given 09/23/2003 publicizing seven technologies. The goal was to initiate 2-3 pilot projects.
- **Accomplishment:** Thirteen proposals were received by the subgroup. By using project co-funding and relatively small awards from SARP (\$15K-\$42K), six pilot projects were initiated, at ARC, GSFC, JPL, JSC, MSFC, and United Space Alliance. Technologies being deployed include formal inspections, code analysis tools (including CGS developed within the ASE group), and defect classification. Applications include ISS payloads and spacecraft flight software (FSW). Several of these projects have already borne fruit, for example, by finding defects in software. This approach and pilot project progress was presented at NASA OSMA SAS'04 in Morgantown, VA on 07/21/2004, where it was awarded "Best New Research" for its impact on NASA projects. Progress was also presented at the Software Working Group meeting in Cleveland 08/12/2004. A ViTS that publicized six new technologies was presented 05/18/2004 to 85 attendees across NASA. Five pilot project proposals were received; these were reviewed and recommendations were made to the SARP evaluation board, who decided to fund four. Information about these activities is available at <http://ti.arc.nasa.gov/researchinfusion/>.
- **Future Plans:** The subgroup will continue tracking the progress of the ongoing collaborations and will produce final reports. The next pilots will be initiated in CY05. The attendees list will be mined for further customer leads. Another ViTS was held March 23, 2005.