Emtech Space

Independent Software Verification & Validation

We Guarantee Mission Safety.

- Small team of experts able to manage ISVV programmatic uncertainty.
- Traditional ISVV methods with novel engineering and automated tools.

Key Features

- Full Independent Software Verification and Validation (ISVV) aligned with the ESA ISVV Guide and institutional best practices.
- Capability to assess compliance with coding standards such as MISRA and adapt clients' tools to detect low-level defects.
- Support for Incremental delivery of verification & validation reports to quickly identify quality deviations, and match mission-critical client needs.

Independent Verification

Systematic assessment of requirements, design, and code to ensure complete, correct, and consistent software implementation.

Independent Validation

Robustness testing targeting worst-case scenarios and boundary violations, integrated with SVF for automated and repeatable execution.

ISVV management and planning

Agile management leveraging a dedicated team of experts to meet mission complex mission schedules.



Key Project Heritage & Prime/Sub-Contractor Roles

- **JUICE** | On the flight software of scientific payloads (DPU and RIME) | **Sub-contractor**
- **CRISTAL** | V&V of PUS library and OBMPs | **Sub-contractor**
- **LSTM** | Differential V&V Coordinated with CRISTAL | **Prime contractor**

Procedure*

System Development and ISVV



Software Requirements

Requirements Specification



Software Design

Architectural and Detailed Software Design, User Manual



Software Development

Software Source Code



Software Testing

Software Test Specification

Independent Validation Activities

Identification of test cases according to IVE output

- Worst case analysis
- Stress tests for software robustness
- Stability and reliability
- FIDIR analysis
- Interface testing etc. (Test Plan)

Construction of test procedures

- Automated test procedures
- Minimizing user intervention.

Execution of test procedures

- Validation findings
- Observations and problem reporting. (Test Report)

Tools: EGSE platforms (e.g. RASTA) and SMP2 simulation platforms (e.g. SimTG, SIMULUS)

Independent Verification Activities

Software Requirements Verification

- Requirements, evaluation
- Concept review
- Document inspection.

Tools: DOORS, Cameo Requirements Modeler

Software Design Verification

- Traceability analysis
- Design evaluation
- Interface analysis
- Document inspection

Tools: MagicDraw UML

Software Code Verification

- Static Code analysis
- Standards conformance evaluation
- Integrity analysis

Tools: SonarQube, PolySpace, CppCheck, PC-Lint, Understand, CBMC, Frama-C, CLang

Software Test Specification Verification

- Unit tests analysis, execution, and reporting.

ESA ISVV GUIDE
ECSS-E-ST-40C
(Space Engineering Software)
ECSS-Q-ST-80C
(Software Product Assurance)
MISRA C 2004/2012
MISRA C++ 2008
BSSC 2000/2004/2005

*Contents are subject to change without prior notice.

Contact us

 info@emtech.global

 https://emtech.space