

CASE STUDY



Wind River Systems

Software Verification & Validation Services

Why Aversan?

Aversan has been providing expert services in systems, software and V&V in the Aerospace domain for over 10 years. During this time Aversan has supported many safety critical software development programs. As an independent V&V/development supplier, Aversan has supported DO-178B/DO-178C certification on many past programs. Adherence to the guidelines of DO-178 guide day-to-day activities in design, review and artifact generation. Aversan can support not only testing but also generation of formal artifacts for certification including PSAC, PHAC, SAS, and other planning and summary documents. Come formal certification, Aversan has the experience and knowledge to support customers through SOI audits. Within Aversan's QMS, software standards, guidelines and checklists are all in-place and guided by DO-178. These processes are also continuously improved as best practices are refined and implemented. Aversan is an AS9100C and ISO 9001:2008 certified organization, and puts Quality at the forefront of its priorities. With each project, Aversan continually improves and updates its Quality Management System to improve efficiency and quality of work.

WIND RIVER

About the Company

A global leader in delivering software for intelligent connected systems, Wind River offers a comprehensive, edge-to-cloud software portfolio designed to address the challenges and opportunities critical infrastructure companies face when evolving and modernizing their systems as they work to realize the full potential of IoT.

Wind River technology is found in more than 2 billion products and is backed by world-class professional services, award-winning customer support, and a broad partner ecosystem.

Software Verification & Validation Services

Background

For a couple of years now, Aversan has been performing Independent Verification and Validation (IV&V) services to Wind River Systems (WRS) in support of a Level 'A' Board Support Package (BSP) certification effort. During this time Aversan has ramped up a team of twenty software verification engineers with deep VxWorks knowledge, and in addition has refined our verification service to specifically meet the needs of WRS and their customer base.

With its existing team and familiarity with Wind River processes and metrics, Aversan was uniquely positioned to provide IV&V services to Wind River with minimal ramp-up time/learning curve. This familiarity also enabled Aversan to provide IV&V services on a fixed cost basis, allowing WRS to budget testing services with confidence and come in on budget every time.

Challenges

For Wind River Board Support Package Verification & Validation, particular expertise with VectorCAST is required. VectorCAST is built as an application software testing tool, and requires more hands-on configuration when used to test low-level code such as BSPs. Although, Aversan engineers have the domain expertise necessary to perform this configuration, there were certain skills required to develop specialized application level software with VectorCAST instrumentation that can be used to test BSP software for V&V as well as structural coverage. Aversan overcame this challenge by sending the team to undergo both initial product training as well as internal training. The Aversan team worked diligently to learn the new software quickly and thoroughly, eventually becoming vastly knowledgeable and able to identify latent defects against the implementation by the solution provider.

Some other challenges faced by the team was unscheduled BSP releases and there wasn't any forecast visibility on the issues which have been fixed in the new releases. The team was trying to do testing on a moving baseline which lead to uncertainty on the timeline of results. However, Aversan was able to reduce associated project risks and maintained the project schedule.

Aversan has developed multiple internal processes to improve the efficiency of V&V work done with Wind River. With these processes in place, project planning and management overhead are reduced for each oncoming project as less initial planning is required.

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Aerospace Domain Knowledge

Aversan has supported many DAL (Design Assurance Level) A & B safety critical software development programs as shown in the table below.

- New Software Master; Software V&V (UT, SI, HSI) -A
- F-35 Lightning II PTMS Controller: Software Development; Software Verification -B
- A350 XWB EMSP: Software Development and Test - B
- DASH-8 FSCU: Software Verification - B
- B-737 SRADA: Software Design and Test; Controls Systems Requirements Development; Systems Bench Testing - B
- F-22 VCC Controller: System Engineering; Software Verification - B
- A380 SEPDS: Systems Design; Systems Verification; Software Verification - B
- F-16 EDSC Controller: Software Verification - B
- B-737 APU ECU: Software Upgrade - A
- Jaguar Propulsion Software: Software Upgrade - A
- AS907-3-1E ECU: Software Verification - A
- B-777 ECS Controller: Systems Design - B
- UAV - Predator B: Systems Design - B
- P-X Advanced Patrol Plane: Systems Design; Software Development; Software Verification - B
- Falcon 7-X APU ECU: Software Development - A
- Embraer 450/500 ACC: Software Verification - B
- Data Collection Unit V: Systems Integration Testing; Software Verification - A
- C-5 Galaxy EBAS Controller - B
- P30 APU ECU - A
- Regional Jet FADEC and LGSCU Development - A

Conclusion

Aversan successfully completed DO-178C level A verification and validation activities to support qualification of the two BSPs developed by Wind river Systems to support the Multi-Core Common Processing Resource(MCPR) program. Aversan provided with High level Software Integration Testing , Hardware-Software Integration Test, Code Coverage Analysis and Low level unit test. They supported certification activities through SOI(Stage of Involvement)-1, SOI-3, SOI- 4.

About Aversan Inc.

Aversan is a global engineering company offering project based solutions and staff augmentation services both on and off site. Headquartered in Mississauga, Ontario, we are a leader in engineering design and development of customized end-to-end solutions in Aerospace & Defence, Healthcare, & IT.

Customers

Manitoba eHealth
eHealth Ontario
Honeywell
IBM
Oracle
Laborie
Cancer Care
Ontario

Certifications

AS9100C
ISO 9001:2008
HL7
ITB SME
ITIL
CGP & ITAR Reg.