

SECTOR Aerospace & Defence
STANDARD DO-178B

Case Study



SAAB
DEFENCE & SECURITY



This case study has been contributed by Johnny Johansson, Global Tool Manager at Saab in Jönköping.

ABOUT THE COMPANY

Saab serves the global market with world-leading products, services and solutions from military defence to civil security.

With operations on every continent, Saab continuously develops, adapts and improves new technology to meet customers' changing needs.

<http://www.saabgroup.com/>

"We were able to certify the project to the highest level according to DO-178B (Level A)"

The Business

One of Saab's business units solely develops electronics for aircrafts. The software must, understandably, be developed according to rigorous safety requirements, as human lives are at stake.

The Project

Saab were contracted to develop a system to control the wing flaps on the Airbus A400M. This was a seven year-long project and initially, there were around 100 people involved in the software development.



Airbus A400M Wing Flaps

Certifying the Product

For this project, Saab had to adhere to the rigorous requirements of the international safety standard, **DO-178B**. In order to get the project certified, they needed to provide evidence that the equipment had undergone all possible tests. According to Johnny Johansson, Global Tool Manager at Saab Jönköping, *"30% of team effort was put into developing software, whereas 70% was spent on documentation and validation."* It was crucial that nothing went wrong!

A certification audit involves everything being checked and it is therefore crucial that detailed documentation of the development process can be provided. Saab will be required to provide proof of testing throughout the plane's lifecycle. Should the plane crash, Saab would have to re-create the tests to show they did everything possible to avoid faults in the design and development phases.



DO-178B

Levels of Safety

In the words of Johansson, ***“we must have complete faith in the design before we hand over a project. DO-178B stipulates that a third party must always review your work as an additional safety measure. Saab has a network of independent auditors that review everything we do - we always check everything! At ‘Level E’ the rules are not as strict as for ‘Level B’, and you don’t have to have independent reviews for everything, but we do so anyway. Saab Avionics has a policy that everything that leaves the plant has to have been reviewed.”***

Unit Test

Saab considers software testing to be one of the most critical tasks withing a project and has therefore relied on Cantata for many years. According to Johansson, ***“Cantata is easy to learn and use.”***

When asked specifically about the use of Cantata in the Airbus A400M Wing Flaps Project, Johansson explains: ***“In order to certify a project you need to qualify the tools that were used in the project, including the test tool in its operating environment. We therefore ran a number of test suites that were supplied by the tool vendor. When we had qualified Cantata, we developed and tested the control system for the wing flaps, both in a simulated environment and with the real hardware. This worked very well, and we were able to certify the project to the highest level according to DO-178B, (Level A)!”***

Documentation of the Unit Tests

Johansson continues, ***“At Saab, we document all steps in the development process. Cantata automatically generates test reports that prove what has been tested and how extensive the test coverage was for each test case. We get a test report on what tests have passed and have not passed. With the link from the test report to the source code, we can quickly understand what we need to fix to get a green light!”***

He adds, ***“Cantata allows us to test against requirements in a structured way and gives us the confidence that we have not missed anything! Writing code and getting it to execute is one thing, but that is not the main job. The real job is to prove everything, and some units have over 800 requirements that need to be validated!”***

“Unfortunately and as far as we have seen, test tools do not handle assembly code. Parts written in machine code therefore, need to be manually debugged line by line. If we would have had to do it the same way with source code, it would have taken forever.” Johansson concludes, ***“Now we get it done almost for free with Cantata, only at the push of a button!”***

All case study text has been approved by the relevant customer.

QA Systems acquired the Cantata business taking over all development, support and sales from IPL in March 2012. Cantata is the extension of the Cantata++ tool.

CLASSIFICATION

Cantata has been successfully qualified many times to DO-178B (levels A and B) avionics projects

For information on tool qualification, please visit:
www.qa-systems.com/cantata

MORE ON AEROSPACE & DEFENCE SECTOR:

Our Sector Briefs provide more information on how Cantata was successfully used by relevant customers in various aerospace & defence projects worldwide.

Sector Briefs can be found on the QA Systems website

AEROSPACE & DEFENCE CANTATA USERS INCLUDE:

BAE SYSTEMS

