

SECTOR Aerospace & Defence

Case Study



Controls and Data Services (Formerly OSyS)

At Controls and Data Services (CDS) we provide safety critical controls and asset intelligence solutions to more than 300 customers around the world.

Our high integrity control systems capture and manage equipment data, then our analysis solutions transforms the data into actionable information and delivers it to the right people at the right time.

As part of the Rolls-Royce Group, we have decades of experience supplying solutions to customers in aerospace, marine, energy and industrial power. By enabling operators to make informed decisions, we can help them to reduce costs, improve safety and increase operational performance and efficiency.

Our customers may vary, but they all have the same thing in common: a sustainable business underpinned and supported by Controls and Data Services.



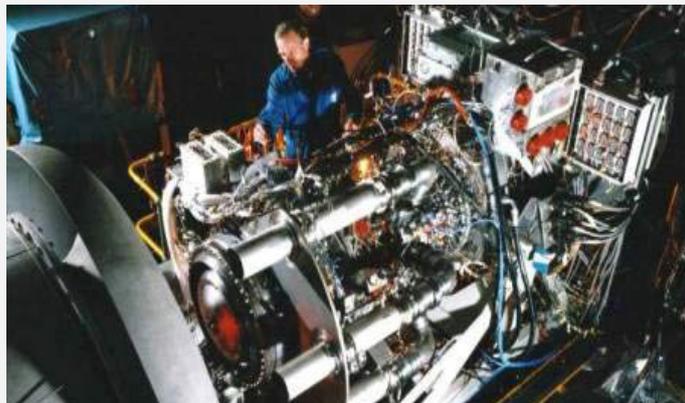
Background

Controls and Data Services have been developing high integrity real time software systems for many years and has its origins in submarine nuclear safety systems for the Royal Navy. The SEAS group is a business unit specialising in high-reliability, high-integrity systems and software, and is actively involved in developing and verifying software, both as a prime and a subcontractor.

DEF-STAN 00-55 Pilot Project

SEAS were contracted by the UK MoD to perform a study on the Def-Stan 00-55. The purpose of the study was to apply the standard to a real project and to make recommendations on how the standard might be improved. Mark Jones, project engineer, selected AdaTEST 95 as the most promising tool to help investigate the design and code/test phase of the work, on the basis that it offered flexible functionality and multi-platform availability.

AdaTEST 95 proved versatile and gave valuable feedback on both design and code verification. Some of the study's conclusions, to which AdaTEST 95 contributed, included the need for a greater emphasis on testing, specifically coverage analysis and on-target testing. The justification for this was based on the value-for-money contribution of the activities; testing being seen as an important complement to a full formal methods design.



The BR710 Aero-engine

BR710 Digital Engine Controller

During the Def-Stan 00-55 Pilot Project, SEAS had also become involved with a project to provide Ada testing expertise to a group at RoSEC (Rolls Smiths Engine Controls - a joint venture between Rolls-Royce and Smiths Industries) who were developing an Electronic Engine Controller (EEC) for the BMW-RR BR710 aero-engines.



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SEAS was selected to lead the Independent Verification and Validation (IVV) work on the project, for which AdaTEST 95 had already been independently selected as the testing tool. This work involved testing approximately 900 Ada procedures to an extremely high level of reliability. The testing performed by SEAS met the requirements of the avionics guidelines defined by RTCA DO-178B Level A.

Project engineer, Dave Woodhall, had the most to say about AdaTEST 95's contribution: *"Apart from a few initial tweaks to accommodate project specific requirements, AdaTEST 95 was wholly reliable, robust and easy to use. Use of script templates enabled staff unfamiliar with AdaTEST 95 to be productive from an early stage, which was vital given the volume of work to be done. Our confidence in AdaTEST 95 has contributed to timely delivery of test results to the customer."*

Nuclear Monitoring System

AdaTEST 95 and Cantata were also employed in a contract for BNFL Engineering Ltd. This is a safety-related (IEC 1508 Level 3) system for monitoring equipment in a hostile environment. The project was unusual in that two systems were developed, one in C and the other in Ada. The C system was to provide support during plant commissioning, while the Ada system was to be used when the plant went live.

The commonality of the tools allowed staff with AdaTEST 95 experience to be utilised in the testing of C with minimal retraining. The Ada side of the project used a far more rigorous approach to analysis and design. This led to far fewer faults being found at the unit test stage, with most errors being caught during manual code scrutiny. Most significantly though, unit testing found faults introduced by errors within the compiler and the few residual coding errors. Without unit testing, these would not have been detected until a higher level of testing, where the cost of detection and correction would have been much higher.

Conclusion

In the words of Jones, *"For us, the evidence speaks for itself. AdaTEST 95 has been used with great success on different projects over the years. From our point of view, this tool is central to the way we develop high-integrity and high-reliability software to the standard our customers expect."*

All case study text has been approved by the customer.
QA Systems acquired the AdaTEST 95 business, taking over all development, support and sales, from IPL in 2012.
AdaTEST 95 is the extension of the AdaTEST tool.

MORE ON AEROSPACE & DEFENCE SECTOR:

Our Sector Briefs provide more information on how AdaTEST 95 was successfully used by other customers in various aerospace & defence projects worldwide.

Sector Briefs can be found on the QA Systems website.

AEROSPACE & DEFENCE CUSTOMERS INCLUDE:

BAE SYSTEMS

