

# LDRA are "Instrumental" in the Lightning II Project

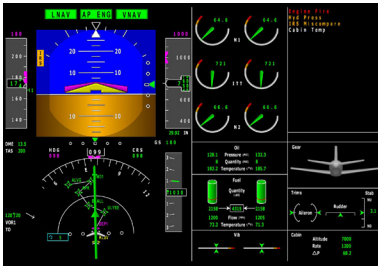


## The Client

*Seaweed Systems is a supplier of High Performance OpenGL graphics drivers and devices to the Military and Aerospace industries for use in safety critical applications, such as flight deck instrumentation.*



*This market focus combined with the safety-critical nature of the applications that are developed using their products have dictated that, from the outset, the company has developed the OpenGL driver to be DO-178B Level A compliant.*



Examples of Seaweed Graphical Displays

## Project Requirements

For the Lightning II project Seaweed Systems needed a means of capturing coverage across the entire OpenGL driver running under the Integrity-178 operating system. The Integrity-178 operating system is a highly restrictive environment that uses the ARINC-653 standard to enforce strict security between user partitions to prevent failure in any one partition.

Martin Beeby, Seaweed Systems, Company Quality Officer said: "The challenge was to be able to capture DO-178B Level A structural coverage data across the entire Seaweed Systems software while executing our automated test suite."

With graphics being a real time activity, any instrumentation inserted by the LDRA tool suite needed to:

- Have minimal impact on system performance whilst yielding comprehensive and correct results.
- Facilitate the required simultaneous capture of coverage data for 3 independent components:
  - User partitions / application space
  - The operating system Kernel
  - The operating system Interrupt Service Routine (ISR).

Martin continued: "Previous attempts to capture coverage using other tools had resulted in significant effort integrating the structural coverage capture tool with the operating system and test suite."



Martin Beeby

"With the *LDRA tool suite* once the scheme for instrumenting and capturing the coverage data had been designed, it was then quickly possible to automatically instrument all of the Seaweed Systems source code as part of the standard build process. The resulting three objects were then integrated into the target system."

"Test execution histories were post processed by the *LDRA tool suite* to yield coverage data for the entire Seaweed Systems source base in one test run. With the benefit of the extensive *LDRA tool suite* command-line facilities all of this was achieved without using the GUI, and therefore satisfied the key goal of providing a seamless interface to the Seaweed Systems automated test suite."

**"Having a fully portable solution dramatically reduces project risks"**

## The Benefits

The key benefit of the application and use of the *LDRA tool suite* to Seaweed Systems has been the ability to implement a fully automated structural coverage solution that is target OS independent. This provides Seaweed Systems with a significant advantage as their customers use just about every flavour of OS.

The integration with the *LDRA tool suite* is now in place to support all of Seaweed Systems' customers operating system configurations without the need for any additional work. In addition, the fact that the *LDRA tool suite* is qualified as a verification tool for DO-178B means that it meets Seaweed Systems strict certification goals.

## The Future

In the past Seaweed Systems was a slave to the structural coverage tool choice of their customers. This resulted in significant levels of effort and risk for every project that Seaweed Systems undertook. With the *LDRA tool suite* Seaweed Systems now has a portable solution that will suit all customers without any risk. As a result Seaweed Systems is mandating the use of the *LDRA tool suite* for structural coverage in all future projects.

Building upon the success of using the *LDRA tool suite* for structural coverage, Seaweed Systems is now looking to apply *TBrun* for unit testing, and code review for programming standards checking functionality to other areas of the Seaweed Systems software development and verification process.

**"Seaweed has full support for any OS using LDRA"**

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