Automated Verification Sharply Reduces UIMDB Certification Time

DO-178B, Level A Certification Achieved in Less Time, with Improved Quality, and Full Documentation

Who are UIMDB?

The Russian firm Ulyanovsk Instrument Manufacturing Design Bureau (UIMDB) supplies onboard computer systems, integrated air data systems, integrated flight and navigation data display systems, lighting equipment and various instruments and sensors for fixed and rotary wing aircraft.

These critical systems are used on aircraft such as the Sukhoi Superjet 100, Tupolev Tu-204SM, and the forthcoming Irkut MS-21. These aircraft are expected to successfully compete in international markets as well as meet the needs of domestic aircraft operators.

What was the challenge?

Sergey Zhelepov

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"Before, we verified our software manually," noted Sergey Zhelepov, Onboard Software Verification Group Leader for UIMDB. "DO-178B demands strict, uniform compliance. It's easy to make mistakes with manual testing and these errors are hard to find. We had a hard time making deadlines."

Building upon their previous experiences, UIMDB decided that the best solution was to automate and streamline the certification process to reduce the frequency of time-consuming mistakes that occurred with the use of manual methods. A key element of this solution that set LDRA apart from the competition was the ability to satisfy Level A compliance criteria for full object code verification.

How did LDRA provide a solution?

When it came to streamlining the test and certification process, deployment of LDRA tools offered the following considerable advantages:

- Automation of a broad range of previously manual software testing tasks through an integrated environment
- Boosted confidence regarding test processes and results due to the tool suite's track record of helping qualify hundreds of DO-178B projects worldwide
- The provision of detailed reports that quickly identified where further analysis was needed

"In adopting an automated verification process, we made a point of taking advantage of the full LDRA tool suite," confirmed Mr. Zhelepov. "We used it at every development and code verification stage—for code verification, code coverage, unit testing, secure coding rules and standards adherence."

UIMDB integrated the LDRA tool suite into their current workflow easily and began analyzing low-level requirements and code before hardware was available. Mr. Zhelepov added, "LDRA tool suite includes an intuitive interface and detailed documentation. By applying the tool suite at such an early stage, we were able to identify source code errors and standard violations during coding."

With the principle of integration proven on the first project, UIMDB then extended these same processes to other projects involving different target architectures.

Mr. Zhelepov explains, "The LDRA tool suite adjusts to new targets quite easily, even when you're testing DO-178B Level A object code." LDRA provides object code verification, directly relating code coverage at the source code level with that achieved at the object code level.

What edge did you gain?

"LDRA tool suite reduced the number of man hours in our certification efforts by 5-10 times," confirmed Zhelepov.

Because the LDRA tool suite is so comprehensive, UIMDB streamlined their certification, replacing a number of tools and programs. "We now test more code and our overall code quality has gone up," added Mr. Zhelepov. "At this point, the LDRA tool suite manages all of our low-level testing."

What's next?

The LDRA tool suite has proved capable of supporting all of UIMDB's test requirements, becoming the company's de facto testing tool for the last five years running. UIMDB is now working on a number of systems for the Irkut MS-21 aircraft.

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Contact LDRA and discover how you too can harness the power of the LDRA tool suite and develop better, more reliable software.

w: www.ldra.com   **e**: info@ldra.com