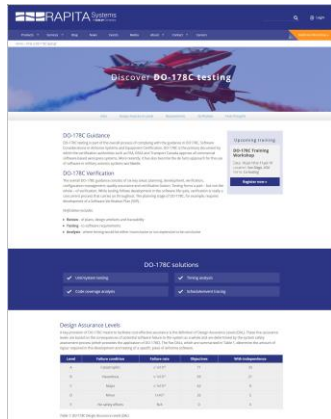


CLIENT Rapita Systems
PROJECT Web article on DO-178C Testing
OBJECTIVE Provide a useful resource for engineers that attracts web traffic and increases brand awareness

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DO-178C Guidance

DO-178C testing is part of the overall process of DO178C, Software Considerations in Airborne Systems and Equipment Certification. DO-178C is the primary document by which the certification authorities such as FAA, EASA and Transport Canada approve all commercial software-based aerospace systems. More recently, it has also become the de facto standard for military avionics software worldwide.

The DO-178C verification process

The overall DO-178C process consists of six key subprocesses: planning, development, verification, configuration management, quality assurance and certification liaison. Testing forms a part – but not the whole – of the verification process.

While testing follows development in a given development cycle, verification is really a concurrent process that is ongoing throughout planning, development and afterward. The planning stage of DO-178C, for example, requires development of a Software Verification Plan (SVP).

Verification includes:

- Review – of plans, design artifacts and traceability
- Testing – to software requirements
- Analysis – where testing would be inconclusive or too expensive to reach conclusion

Note that while DO-178C includes verification that the software performs as required, it does not include validation that the software was specified correctly. Validation should be a part of any system development process, but again, DO-178C covers only software; it does not concern itself with the correctness of system-level requirements.

DO-178C was developed by industry professionals with minimal government oversight, so it was meant to be practical. It was designed to be flexible, so it can be applied to any development model. It was intended to ensure airborne software is as safe as can reasonably be expected, while also being cost effective.

Design Assurance Levels (DAL) or safety criticality

A key provision of DO-178C meant to facilitate cost-effective safety is the definition of Design Assurance Levels (DAL). These five levels of safety criticality are based on the consequences of potential software failure to the system as a whole and are determined by the system safety assessment process (which precedes the application of DO-178C).