



**LDRA**  
Certification Services

The Certification Solution  
for Safety-Critical  
Applications

LDRA Certification Services (LCS) offers products and services that expedite the delivery and reduce the cost of achieving FAA/EASA certification. For nearly 40 years LDRA has provided safety-critical software verification tools and software best practices to organisations who must adhere to safety-critical standards. This legacy is now extended by the LCS Team, comprised of certification experts credentialed across all aviation disciplines, that has led hundreds of aircraft OEMs and suppliers to achieve their certification goals on schedule and under budget. Bringing further added value to LDRA customers, the LCS Team has partnered with development and verification specialists who use the *LDRA tool suite*® and other complementary tools to prepare products for certification and ease the burden for applicants.

LCS provides comprehensive coverage for a definitive set of aviation standards, encompassing the following aviation disciplines:

- Aircraft & Systems Development (ARP-4754A/ED-79A)
- Safety Assessment (ARP-4761/ED-135)
- Environmental Testing (DO-160G/ED-14G)
- Integrated Modular Avionics (DO-297/ED-124)
- Flight Electronic Hardware (DO-254/ED-80)
- Flight Software (DO-178C/ED-12C)
- Ground Systems (DO-278A/ED-109A)

In each of these varied disciplines the LCS comprehensive services provide the highest possible level of confidence in the accuracy and completeness of the decision process, consequently minimising risk and associated cost. LCS analyses certification and safety needs from an aircraft system perspective while

assuring that the individual and exacting aviation standards are met.

Proficient in both commercial and military airworthiness regimes, only LCS can address all critical project requirements as they relate to certification, including compliance management and planning, staff training, development, verification and production. LCS is also unique in offering *packaged solutions* for even the most challenging certification opportunities.

The LCS certification proficiencies and associated tools extend into other safety-critical markets such as industrial control, automotive, medical device, nuclear power and transportation systems. Please contact an LCS representative for additional information -

[LCS@ldra.com](mailto:LCS@ldra.com)





**Kevin Meier, FAA DER**

The renowned LCS Team is led by Kevin Meier. Kevin is a Systems and Equipment, Electrical FAA DER with Level A authority for Avionics/Electrical Systems, Software, Airborne Electronic Hardware and Aeronautical Security. As a DER and certification subject matter expert with ARP 4754A, DO 178B/C and DO-254 credentials, Kevin has worked with the largest and best-known OEMs and suppliers of avionics. He was a Member of the RTCA/SC 205, DO 178C / DO-278A Committee and is currently an Executive Committee Member on the Forum on Aeronautical Software recently formed to oversee the application of DO-178C and its supplements, DO-330, DO 331, DO-332 and DO-333. Kevin has extensive experience related to Environmental and Systems qualification to RTCA/DO-160(). As part of SC-205, Kevin was a member and participated in the subgroup that produced DO-331, Model Based Development and Verification. He is currently a member of RTCA/SC 216, Aeronautical Security Committee as well as the newly formed FAA Aviation Rule Advisory Committee (ARAC) Aircraft Systems Information Security Protection (ASISP) working group. Kevin has recently participated in the GAMA Software Assurance Ad-Hoc leading the Portability Data working group and GAMA ASISP Ad-Hoc committee. Kevin has worked as a consultant at companies such as Textron Aviation, Cessna Aircraft Company, AlliedSignal Commercial Avionics Systems and Honeywell Air Transport Avionics Division.



**Steve Morton, FAA DER**

Steve Morton is a consultant FAA Level A Software DER with extensive expertise in the development and use of aerospace software tools. Steve was a member of SC-205, which developed DO-178C, DO-278A, and their technology supplements. Steve substituted as acting co-chair of subgroup 3, which was responsible for the Software Tool Qualification Considerations supplement to DO-178C, and was an Editorial Subcommittee Member for DO-248C. In addition to his consultancy at TBV Associates, Steve was formerly a Software DER at Hawker Beechcraft Corporation where he had responsibilities across the spectrum of HBC's Part 23 and Part 25 aircraft line up. Steve has provided training on tool qualification at multiple FAA National Software and Airborne Electronic Hardware Conferences.

### 3 Easy Steps to Get Started:

- Step 1:** Receive a Complementary Telephone / WebEx Consultation with a LCS Level A DER.
- Step 2:** Review your Free Certification Roadmap Prepared by the LCS Team.
- Step 3:** Implement the Certification Roadmap.

LCS support encompasses the numerous services performed by the LCS Team and aligned development and verification specialists. LCS manages these services to conform with aviation standards and facilitate the information flows depicted in Figure 1. The LCS support services are categorised as follows:

- FAA Designated Engineering Representative (DER) and Subject Matter Expert (SME) services
- Training and mentoring
- DO-178C development and verification services
- DO-254 development and verification services
- Packaged solutions

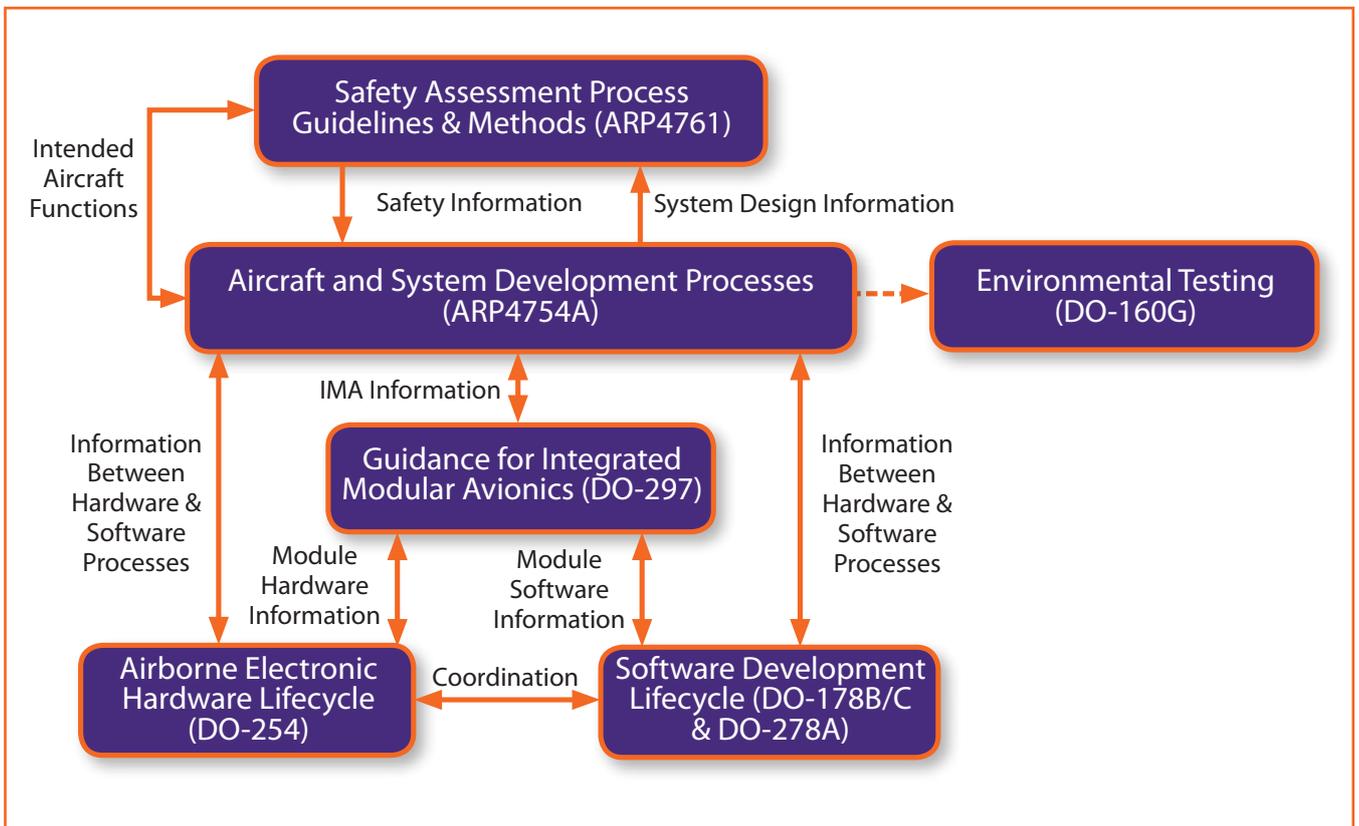


Figure 1: LCS Standards Coverage

## DER Services

LCS FAA DER Services provide key support to LCS clients across the entire product life cycle. Services include Certification Roadmaps, FAA Compliance Findings and Certification Liaisons (FAA, EASA, TCCA, CAAC). The LCS FAA DER becomes involved with clients at or near project inception, followed by training and then continues involvement providing Stage of Involvement (SOI) audits and more general support. In addition to the training and bundled services identified on the next page, LCS FAA DER consulting days are also available.

### Training

LCS Training includes world-class on-site or web-based training for DO-178B/C, DO-278A, DO-254 and ARP 4754A and associated engineering disciplines. LCS courses are created and delivered by Level A FAA DERs and safety specialists. These instructors are internationally recognised experts, credentialed by regulatory agencies around the world, who have practical experience in the disciplines they teach. LCS Training features hands-on tasks and real-world scenarios. Course outlines, including customised seminars, are available upon request.

Additional training courses offered are:

- System and Software Certification for Executives
- Quick Start with LCMS (LDRA Compliance Management System)

### DO-178 Design and Verification Services

LCS has more than 40 years experience in safety-critical software design and development.

LCS offers software design for safety-critical embedded systems utilising virtually any processor technology, including microprocessors or microcontrollers. Through the use of the *LDRA tool suite*, LCS also offers verification services compliant with DO-178B/C. These services can be applied to new or existing software designs for any segment of the DO-178B/C lifecycle. All of the artefacts including documentation, records, and data are provided with the DO-178B/C package levels A through to D. Figure 2 depicts the DO-178B/C lifecycle which is fully supported by LCS.

### DO-254 Design and Verification Services

Using the foremost DO-254 tools in the industry, LCS offers hardware electronic design at the box/LRU, board/circuit card, or FPGA level. Designs are compliant to DO-254 Level A through D and all of the artefacts including documentation, records, and data are provided. LCS will also apply any or all of the DO-254 lifecycle in preparation for certification of existing designs, whether complete or prototype.

### Packaged Solutions

FAA Stage of Involvement (SOI) audits are performed by LCS Level A DERs as part of a Certification Roadmap. These audits can be performed as packaged solutions for DO-178B/C, DO-278A and DO-254 when combined with the purchase of LCMS. Stepwise Gap Analyses and Finding of Process Compliance (FOPC) are also offered.

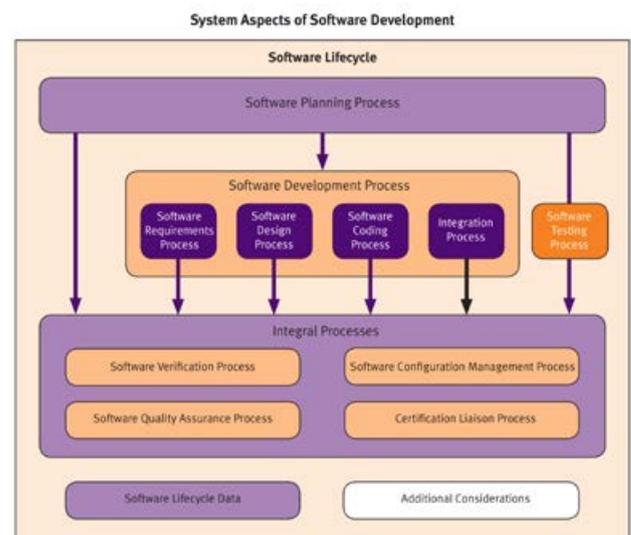


Figure 2: DO-178B/C Lifecycle



## LDRA Compliance Management System

LCMS ensures applicant compliance to DO-178B/C, DO-278A and DO-254 standards. LCMS facilitates the certification process by providing an audit interface for regulators and their representatives. LCMS also automates the applicant's review activities, typically performed using tools such as Excel and Outlook, by offering a collaboration framework that links the OEM, its suppliers and regulators. The effectiveness of LCMS has been proven over many years and is based on best practices from industry, authorities (FAA, EASA, Military) and Subject Matter Experts (SMEs).

LCMS provides the development organisation with the ability to easily and quickly collect and organise compliance evidence. In this process, evidence is readily available and traceable to both the project team and the Certification Authority. LCMS includes a definitive set of DO-178B/C, DO-278A and DO-254 Process Compliance Documents (PCDs). The PCDs are definitive and when properly elaborated with LCS DER/SME support, are ready for FAA/EASA approval.

The screenshot displays the 'Program Management Interface' with a search bar, navigation links, and a table of programs.

Account: Admin [LCMS Manual](#) [Add Prog](#) [Default Prog](#) [Manage Docs](#) [WSMS](#)

Program List [Logout](#)

Prog Id	Program Name	Type	DAL/AL	Rec Date	Docs	Review	PRs	Edit
P00001	Flight Data Monitoring System	DO-178C	C	28/01/2016	<a href="#">View</a>	<a href="#">View</a>	<a href="#">View</a>	
P00002	Cabin Pressure Control System	DO-254	B	28/01/2016	<a href="#">View</a>	<a href="#">View</a>	<a href="#">View</a>	
P00003	Fuel Management System	DO-178C	A	28/01/2016	<a href="#">View</a>	<a href="#">View</a>	<a href="#">View</a>	
P00004	De-Icing System	DO-178C	A	28/01/2016	<a href="#">View</a>	<a href="#">View</a>	<a href="#">View</a>	
P00005	Smoke Detector System	DO-254	D	28/01/2016	<a href="#">View</a>	<a href="#">View</a>	<a href="#">View</a>	
P00006	Transponder Control System	DO-278A	1	28/01/2016	<a href="#">View</a>	<a href="#">View</a>	<a href="#">View</a>	
P00007	GPS Controller	DO-178C	C	28/01/2016	<a href="#">View</a>	<a href="#">View</a>	<a href="#">View</a>	
P00008	Throttle Quadrant Assembly	DO-254	B	28/01/2016	<a href="#">View</a>	<a href="#">View</a>	<a href="#">View</a>	
P00009	Cockpit Display System	DO-178C	B	28/01/2016	<a href="#">View</a>	<a href="#">View</a>	<a href="#">View</a>	
P00010	Inertial Navigation System	DO-178C	B	28/01/2016	<a href="#">View</a>	<a href="#">View</a>	<a href="#">View</a>	
P00011	Aircraft Braking System Electronics	DO-254	A	28/01/2016	<a href="#">View</a>	<a href="#">View</a>	<a href="#">View</a>	
P00012	Ground Augmentation System	DO-278A	2	28/01/2016	<a href="#">View</a>	<a href="#">View</a>	<a href="#">View</a>	

Programs: 12 | DO-178B: 0 DO-178C: 6 DO-254: 4 DO-278A: 2

Figure 4: LCMS Program Management Interface

## LCMS Integrated Document and Transition Checklists

LCMS also offers checklists that are essential to ensuring process compliance and helping the applicant achieve the DO-178B/C, DO-278A and DO-254 Objectives. The checklists have been refined over the course of hundreds of successful programs and reflect the latest regulatory guidance. The checklists produce self-documenting compliance data with easy-entry windows for review comments.

**LDRA**  
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**A selection of LCS clients in the aerospace industry**



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