

DO-254 Training

Day1 - Agenda: (Instructor - Roy Vandermolen)

Understand the Regulatory Background for DO-254/ED-80

- Short characteristic of FAA and EASA organizations
- DO-254/ED-80 is a guidance (addressed by AC 20-152) to meet 14 CFR Parts ...
 - EASA uses set of Certification Specification but the intent or same text is equivalent to FAR
- Short characteristic of DO-178C/ED-12C, DO-297, DO-330/ED-215

Understanding the Guidance Material for Hardware Development

- DO-254 is a guidance not a technical specification
- Issue Papers (CRI in EASA), orders, cast papers - purpose, content, examples
- EASA CM SWCEH-001 (Certification Memorandum) - purpose, content

Understanding the Certification Liaison Process

- Certification vs Compliance
- Communication with certification authority:
 - Designees
 - Stage Of Involvements (SOI)
 - Job Aid - Conducting AEH Reviews

Learn about the System Safety

- DO-254/ED-80 in ARP4754A/ED-79A context
- Aircraft Functional Hazard Assessment and Preliminary Aircraft Safety Assessment
- System Design and Analysis
- System Functional Hazard Assessment and Preliminary System Safety Assessment
- Design Assurance Level (DAL)
 - Design Assurance Level and Hazard Classification
 - Flow down of DAL (to the hardware item)
 - Reducing DAL

Achieving the Design Assurance

- Design Assurance through DO-254
- The amount of rigor in development process identified by DAL
 - Appendix A
 - Appendix B
 - Traceability
- Design Assurance through design practice

Day1 - Objectives:

- Understand the regulatory background for DO-254
- Understand the guidance material for DO-254
- Learn the difference between various design assurance levels
- Appreciate the difference between DO-178B and DO-254

Day2 - Agenda: (Instructor - Roy Vandermolen)

Learn how to Plan the DO-254 Development Process

- Overview of Hardware Lifecycle
- PHAC
 - Purpose, required content, example
 - FAA order 8118.105 aspects
 - PHAC in certification liaisons
- Tool Assessment and Qualification
 - Design tools, Verification tools, other tools
 - Independent assessment in practice
 - Using Qualification packages delivered by vendors
 - Example with basic tool qualification (linting rules or code coverage tool)
- Design Plan
 - Purpose, required content, example
- Validation and Verification Plan
 - Purpose, required content, example
- Configuration Management Plan
 - Purpose, required content, example
- Hardware Process Assurance Plan
 - Purpose, required content, example
- Standards
 - Hardware Standards, V&V standards, Archive Standards
 - Example tools that can be used to enforce hardware standards
- Changes in the plans and standards throughout design process

Learn how to Manage the Requirements

- Capture, development, analysis, allocation, decomposition
- Functional and non-functional requirements
- Derived requirements
- Requirements organization (by function)
- Examples of good and bad requirements
- Traceability, coverage analysis, impact analysis
- Requirements Validation
- Hardware Requirements Data Document

Day2 - Objectives:

- Work on an example PHAC
- Understand the hardware design life cycle
- Understand the documents and data produced during the lifecycle
- Learn how to write requirements

Day3 - Agenda: (Instructor - Roy Vandermolen)

Understanding the Hardware Design Process

- Conceptual design, detail design
- Traceability, coverage analysis, impact analysis
- Design Practices
- Design Review
- Hardware Design Data Document

Understanding the Verification Processes

- Requirements based verification
- Verification methods (review, analysis, test)
- Independent verification for level A and B
- Testcase, testbench, test procedures
- Traceability, coverage analysis, impact analysis
- Appendix B: Advanced Verification Methods
 - Elemental Analysis

Learn how to use the Commercial Off-The-Shelf (COTS) Components

- COTS Intellectual Property (order08110.105)
- Simple and Complex hardware functions
- Achieving compliance for IPs
 - Full documentation from an IP vendor
 - Reverse engineering
 - Extensive testing and analysis
 - Architectural mitigation
 - Product service experience

Understanding the Assurance Process

- Independence
- Audits
- First Article Inspections

Day3 - Objectives:

- Understanding the Hardware Design Process
- Understanding the Verification Processes
- Understand the data needed for COTS devices
- Understanding the Assurance Process

ALDEC Safety-Critical Solutions DO-254

Day4 - Agenda: (Instructor - Janusz Kitel)

- RTCA/DO-254
- FPGA Flow for DO-254 Compliance
- Aldec DO-254 Solutions
- DO-254 Training and Consulting Services
- Requirements Management and Traceability
- HDL Coding Standards
- FPGA Design and Simulation
- Code Coverage
- FPGA Level In-Target Testing
 - DO-254/CTS

Day4 - Objectives:

- ALDEC DO-254 Flow will be explained

Instructor- Roy Vandermolen

Electronic designer with over 35 years of experience in electronics. Currently a Staff Engineer and Certification Manager for electronic flight control systems at Moog Aircraft and an airborne electronics hardware Outside Boeing Authorized Representative (OBAR) for Boeing Commercial Aircraft. He also has worked in a variety of engineering environments including research laboratory, educations institutions, military R&D facilities and commercial aircraft flight controls manufactures. In his career at Moog Aircraft Roy has been involved in the design, verification and certification of numerous Level A flight control systems.

Roy, along with Randal Fulton, taught the DO-254 practitioners course for RTCA in Washington, D.C. from 2006 to 2009.

Instructor- Janusz Kitel

ALDEC DO-254 program manager.