



DIGITAL TRANSFORMS PHYSICAL

DO-178C Template

for Avionics Systems Engineering



Aviation & Defense Systems Engineering

for DO-178C Compliance

Developing airborne products, aviation software, and embedded avionics systems is a complicated task. Integrating the system engineering principles involved in the development of aviation end products and maintaining lifecycle-wide regulatory compliance is a challenge.

This Avionics DO-178C Template helps ensure the overall quality, safety, and reliability of your avionics products. It enables you to reduce the time, effort, and costs of achieving compliance with regulations and standards by the Federal Aviation Administration (FAA), the European Aviation Safety Agency (EASA), and other regulatory bodies.

This Avionics DO-178C Template leverages the powerful capabilities of Codebeamer to support your aviation development processes. It facilitates the fulfillment of DO-178C objectives while reducing development costs. Adhere to aviation industry best practices, simplify compliance, and drive aviation systems engineering excellence with **Codebeamer's Avionics DO-178C Template!**



What's included in this Avionics DO-178C Template?

The template contains predefined and easy-to-understand data model guidelines. It includes built-in examples to show the vertical breakdown of system requirements down to software-coded functions. Using the template also ensures code-level traceability as low-level requirements may be easily connected to source code.

It automatically stores a history of changes on all your artifacts to simplify delta identification. Features like suspected changes and the vertical merge functionality are beneficial when carrying out activities like Root Cause Analysis and change impact assessment.

This DO-178C Template also includes an implementation of core Configuration Management Process activities including Problem Reporting, Change Review, and best practices for Change Control. Regarding the software verification process, the Template covers checklists execution, review management, examples of test cases and test procedures, supports the execution of test procedures, and much more. The management of baselines and releases is greatly simplified by using this Template with PTC®'s Codebeamer Aviation software engineering solution.

Why use this template?

- Your legal shortcut to compliance: Detailed and sophisticated DO-178C support
- Checklists for all core elements (including plans, requirements, verification cases, etc)
- Fully preconfigured yet easy to modify, optimize, or simplify
- Very user-friendly to help you realize value faster
- Advanced capabilities for managing baselines and releases
- Automated change control

Benefits for aviation development stakeholders

for Certification Bodies (EASA):

- Fast evidence creation
- Powerful yet simple traceability queries
- Robustness and meticulous QA
- Flexible reporting
- Automated change control

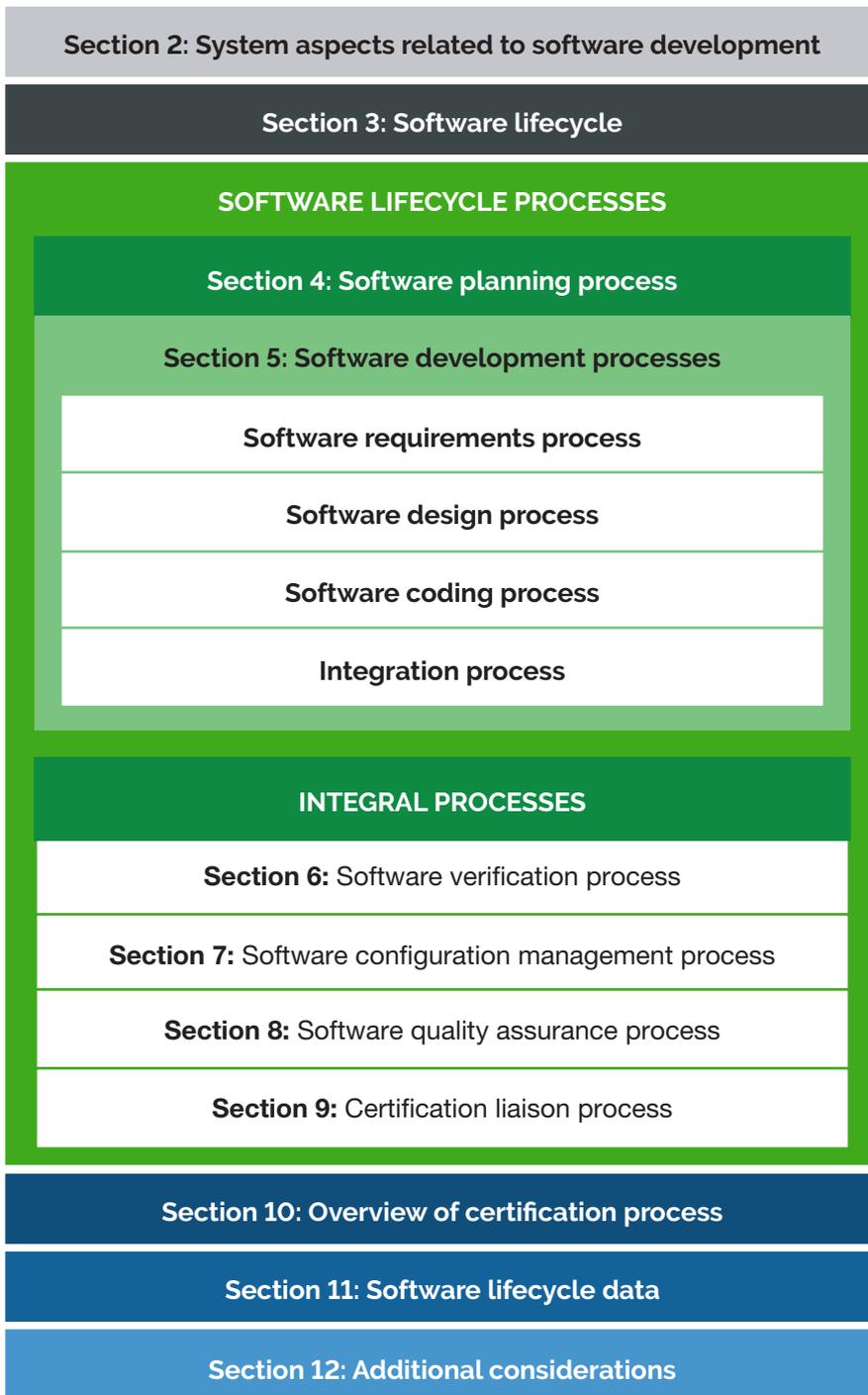
for Avionics Project Managers:

- Predefined but customizable dashboards and widgets
- Full change control on all your artifacts
- Simple requirements reuse to cut costs
- Easy visualization of dependencies
- Ensures project visibility and planning

for Software Development team members:

- Powerful and user-friendly collaboration tool
- Support for impact assessment and RCA through traceability, hyperlinks, and suspected links
- Easy and efficient collaboration throughout development
- Gapless end-to-end traceability down to the code level

DO-178C Document overview



Integrated Aviation Systems Engineering

Codebeamer's Avionics DO-178C Template covers all the objectives of DO-178C via checklists, and it covers the majority of outputs via preconfigured artifacts including examples of software requirements and software design. The checklists and outputs of this template cover all of the objectives for each of DO-178C's Development Assurance Levels.

The template also includes examples of DO-178C workflows that cover key configuration management activities (including problem reporting, change review, and change control). Flexibly adaptable workflows and customizable artifacts in this template allow you to define and enforce the execution of processes that best fit your internal requirements while maintaining compliance with DO-178C.

The system supports the combination of traditional V-model and (scaled) Agile development methodologies (SAFe®, LeSS, or DAD) even in a single project. Preconfigured reports may be easily exported to help monitoring and reporting, while the Audit Trail Dashboard facilitates compliance audits.

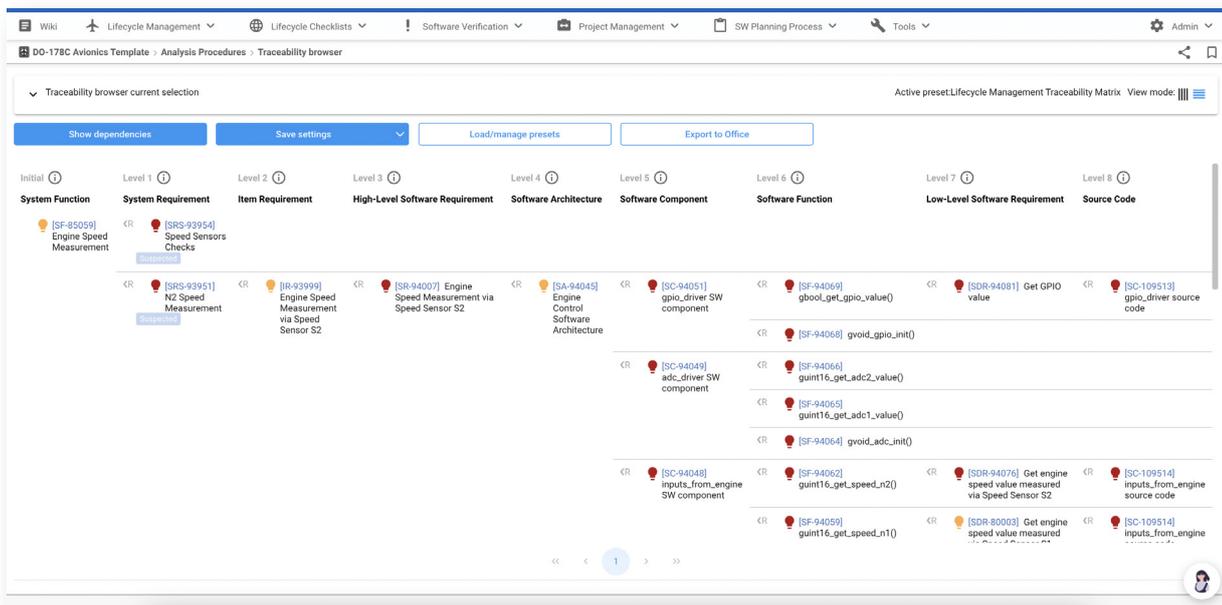
Gapless End-to-end Traceability

Since the entire chain of work items can be linked, and these associations spanning the entire lifecycle are stored in our platform's central repository, complete bi-directional traceability is simply attained. The Traceability Browser helps overview and visualize these links between your work items. Processes (workflows) are also visualized, further ensuring transparency, and a full change history is logged for each individual artifact. A Coverage Browser helps you ensure the adequate test coverage of all your requirements.



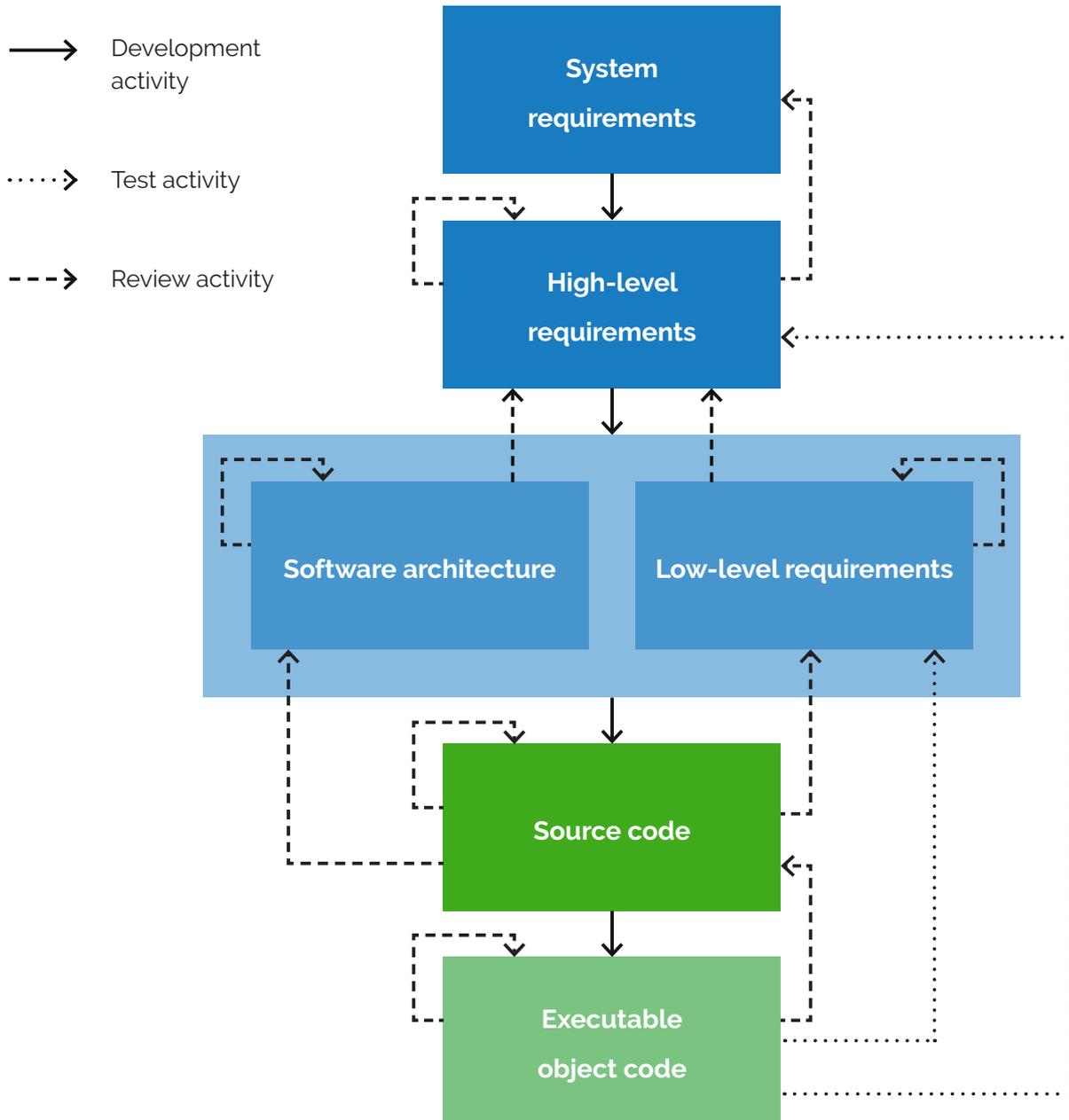
Aviation Requirements Management

Our platform lets you systematically manage functional and non-functional software and hardware requirements throughout the entire lifecycle, while tracking and controlling all changes to them. Taking advantage of our solution's advanced requirements management functionality, this template allows you to specify, organize and document your requirements in a collaborative manner, store them in a central repository, and link them to other artifacts. Managing requirements in libraries enables you to simply reuse requirements in further product variants, together with the test cases that verify them. Our platform's various integrations & export-import features are available to support collaboration and to ensure data consistency across teams and tools.



▲ Traceability throughout the lifecycle

DO-178C workflow



Link Requirements to Tests and Derive Actionable Work Items

Using our platform, you can derive artifacts such as change requests, defects (bugs), source code, tasks, test cases (and so on) directly from your requirements, establishing links between them to ensure gapless end-to-end traceability. Tasks may then be assigned to team members and their progress monitored on Kanban boards. Risks can be easily identified and mitigated or reduced. Test cases can be executed and their results reported on. Traceability is ensured throughout the lifecycle.

Aviation Quality Assurance & Software Verification process

To help manage the Software Verification process, this template includes test cases, test procedures, and supports the controlled execution of test procedures.

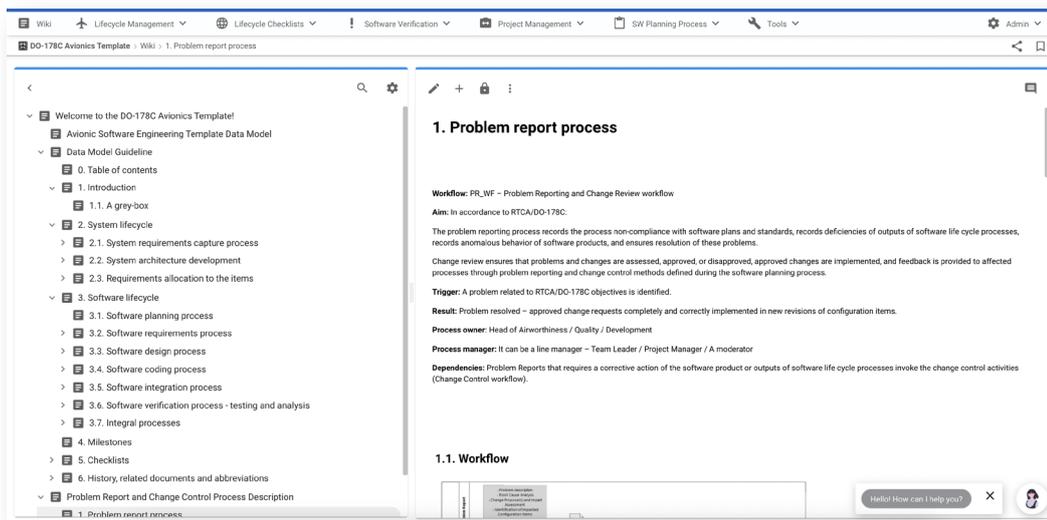
The template also helps you connect quality goals to development activities. It supports test management by letting you define custom test cases, compose test sets, and execute parameterized tests on multiple hardware and software configurations. Accurate and fast automated testing is available via the platform's integration with Jenkins. A Test Coverage Browser and highly customizable dashboards are available to monitor and report on test coverage, execution, and results.

For QA personnel, the template offers customizable dashboards and all-around access to a single source of truth regarding the development lifecycle. Internal audits are supported by automated documentation as well as guarded workflows for meticulous process control.

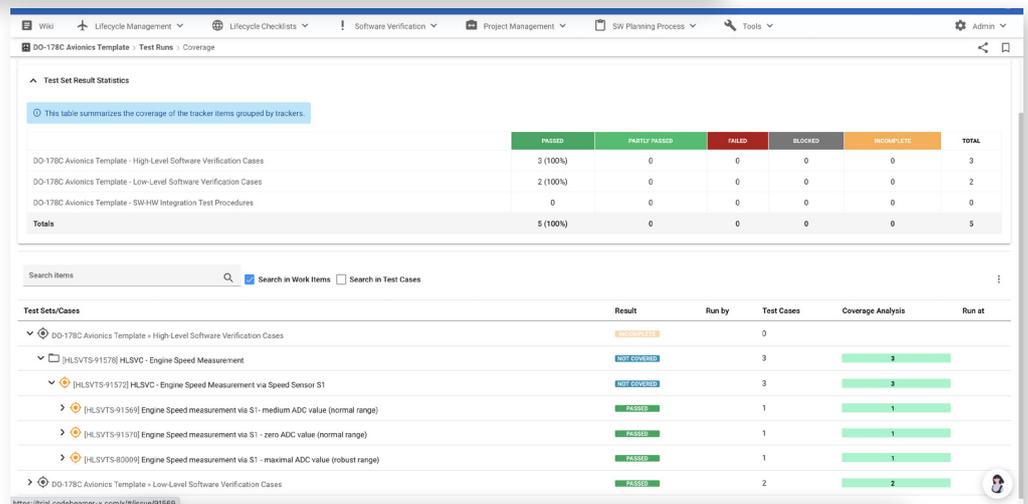


Security and Approval Workflows

In addition to the preconfigured workflows that this Aviation DO-178C Template contains, you can simply define and enforce the execution of your own custom processes. Our platform's project- and role-based security features, and conditional logic & guards (with optional e-signatures) will help you make sure that only the adequate (compliant) processes are used. Configurable access permissions and e-signatures support approval processes and access control, and complete change control helps you monitor and prove these security procedures.

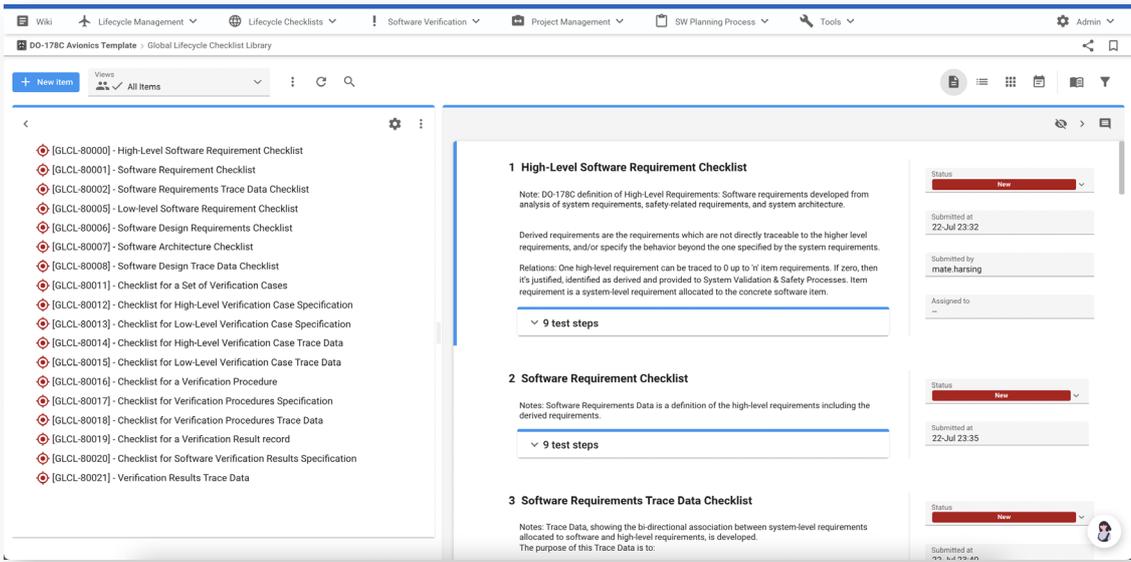


Wiki that acts as benchmark or guideline

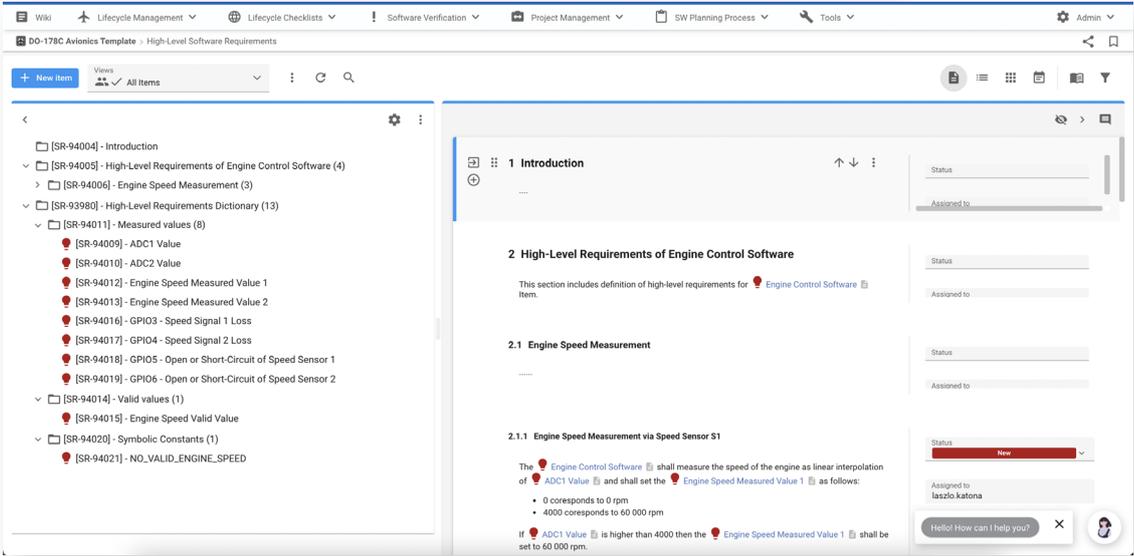


Test Coverage Browser

DO-178C Template for Avionics Systems Engineering

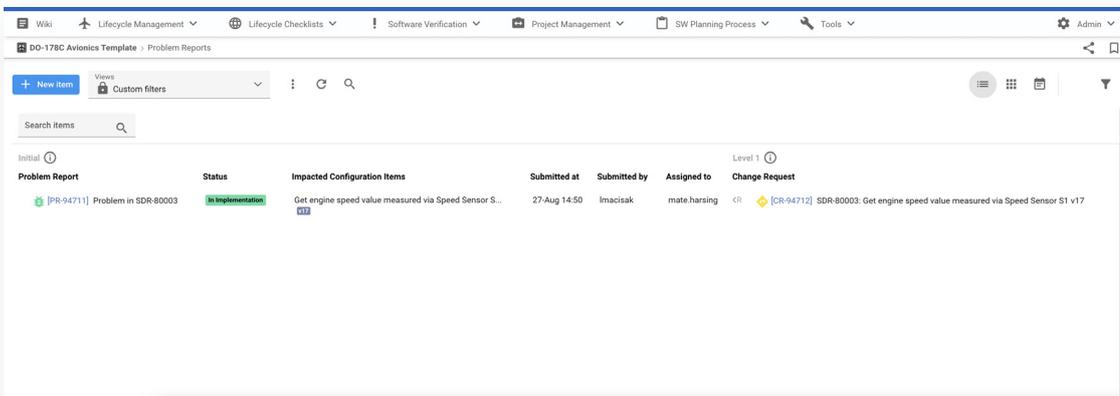
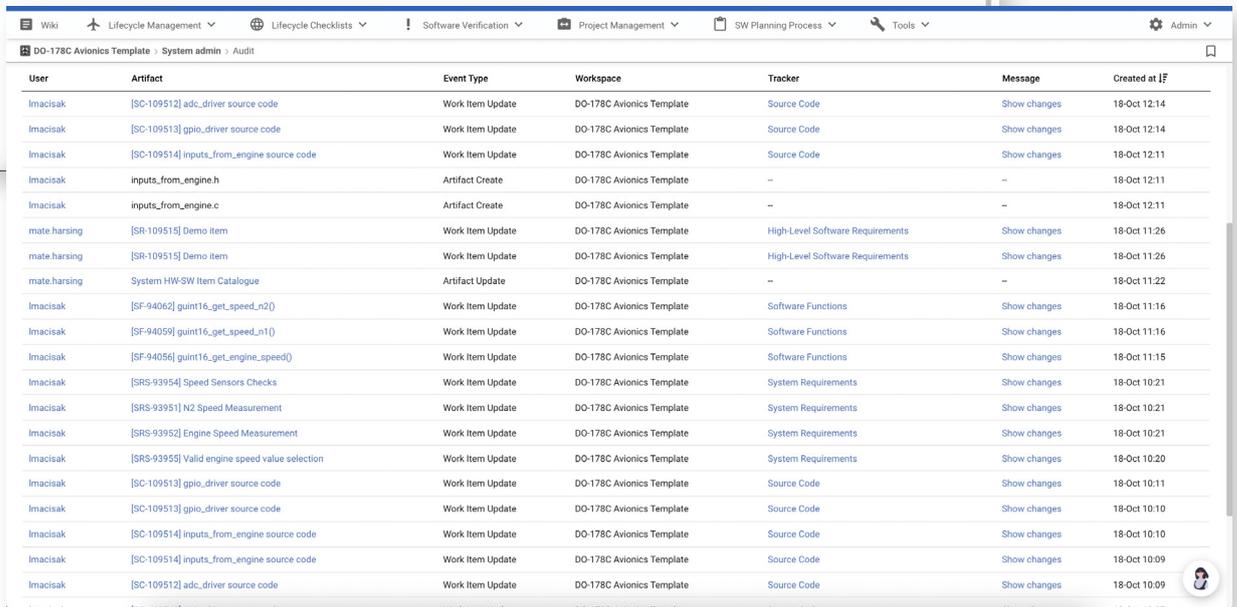


Checklists for all items in scope of the software lifecycle



Real-life examples for all artifact types

**Sophisticated change control
process with automation**

The screenshot shows a web interface for 'DO-178C Avionics Template - System admin - Audit'. It displays a table of system events with columns for 'User', 'Artifact', 'Event Type', 'Workspace', 'Tracker', 'Message', and 'Created at'. The table lists various artifacts such as source code files, demo items, and system catalogues, along with their respective event types and timestamps.

User	Artifact	Event Type	Workspace	Tracker	Message	Created at
Imacisak	[SC-109512] adc_driver source code	Work Item Update	DO-178C Avionics Template	Source Code	Show changes	18-Oct 12:14
Imacisak	[SC-109513] gpio_driver source code	Work Item Update	DO-178C Avionics Template	Source Code	Show changes	18-Oct 12:14
Imacisak	[SC-109514] inputs_from_engine source code	Work Item Update	DO-178C Avionics Template	Source Code	Show changes	18-Oct 12:11
Imacisak	inputs_from_engine.h	Artifact Create	DO-178C Avionics Template	--	--	18-Oct 12:11
Imacisak	inputs_from_engine.c	Artifact Create	DO-178C Avionics Template	--	--	18-Oct 12:11
mate.harsing	[SR-109515] Demo item	Work Item Update	DO-178C Avionics Template	High-Level Software Requirements	Show changes	18-Oct 11:26
mate.harsing	[SR-109515] Demo item	Work Item Update	DO-178C Avionics Template	High-Level Software Requirements	Show changes	18-Oct 11:26
mate.harsing	System HW-SW Item Catalogue	Artifact Update	DO-178C Avionics Template	--	--	18-Oct 11:22
Imacisak	[SF-94062] guint16_get_speed_n2()	Work Item Update	DO-178C Avionics Template	Software Functions	Show changes	18-Oct 11:16
Imacisak	[SF-94059] guint16_get_speed_n1()	Work Item Update	DO-178C Avionics Template	Software Functions	Show changes	18-Oct 11:16
Imacisak	[SF-94058] guint16_get_engine_speed()	Work Item Update	DO-178C Avionics Template	Software Functions	Show changes	18-Oct 11:15
Imacisak	[SRS-93954] Speed Sensors Checks	Work Item Update	DO-178C Avionics Template	System Requirements	Show changes	18-Oct 10:21
Imacisak	[SRS-93951] N2 Speed Measurement	Work Item Update	DO-178C Avionics Template	System Requirements	Show changes	18-Oct 10:21
Imacisak	[SRS-93952] Engine Speed Measurement	Work Item Update	DO-178C Avionics Template	System Requirements	Show changes	18-Oct 10:21
Imacisak	[SRS-93955] Valid engine speed value selection	Work Item Update	DO-178C Avionics Template	System Requirements	Show changes	18-Oct 10:20
Imacisak	[SC-109513] gpio_driver source code	Work Item Update	DO-178C Avionics Template	Source Code	Show changes	18-Oct 10:11
Imacisak	[SC-109513] gpio_driver source code	Work Item Update	DO-178C Avionics Template	Source Code	Show changes	18-Oct 10:10
Imacisak	[SC-109514] inputs_from_engine source code	Work Item Update	DO-178C Avionics Template	Source Code	Show changes	18-Oct 10:10
Imacisak	[SC-109514] inputs_from_engine source code	Work Item Update	DO-178C Avionics Template	Source Code	Show changes	18-Oct 10:09
Imacisak	[SC-109512] adc_driver source code	Work Item Update	DO-178C Avionics Template	Source Code	Show changes	18-Oct 10:09

▲ Audit trail capabilities

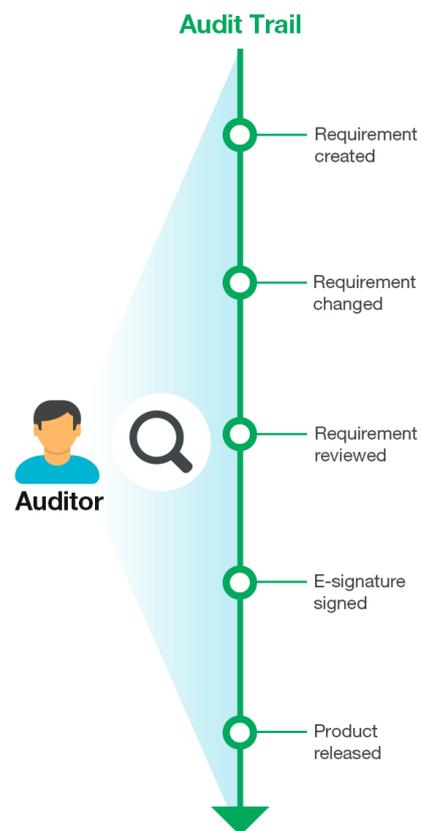
Aviation Compliance & Audit Trail Dashboard

Codebeamer's Avionics DO-178C Template leverages our platform's advanced process control, documentation and reporting capabilities, and provides pre-configured security and process workflows. Therefore, it greatly supports the enforcement of mature aviation development processes, and thus facilitates compliance with relevant standards.

In addition to advanced and automated reporting options, our solution offers an Audit Trail Dashboard to simplify and accelerate aviation compliance. A lifecycle-wide audit trail is automatically recorded with all changes to your work items, fields, workflows and transition diagrams, and an overview of current permissions. All this is accessible with just a few clicks using the comprehensive Audit Trail Dashboard. Using the dashboard, you can create an automatically updated widget with all this lifecycle data, and simply export comprehensive reports to accelerate compliance audits.

Best Practices and Repeatable Processes

Configure our platform to support your company's standard operating procedures, and leverage existing data to propagate quality standards internally. Repeatable processes ensure higher product quality, fewer errors, and reduced project costs. Mature re-use processes help cut the time and costs of development. Leverage existing artifacts (for instance, requirements with the test cases that verify them) and processes, and reuse project configurations to accelerate development and product verification. Visualize and automate workflows with automated gates and conditions, and save costs in the development of quality aviation products.



Baselines

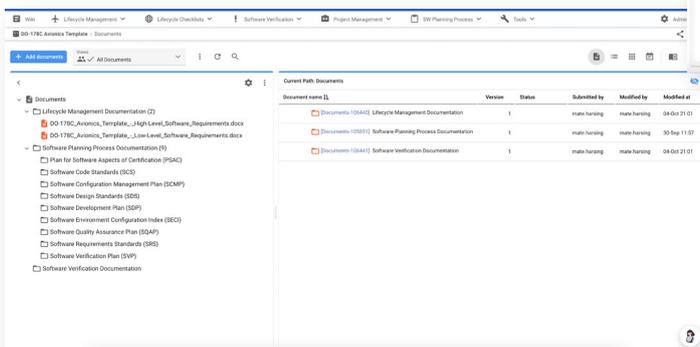
Our platform's baselining functionality allows you to create comprehensive snapshots of the current state of all your artifacts, capturing the entire set of specifications. To support versioning, baselines include wiki pages, documents, attachments, comments, and all types of work items & data that you're using in your development lifecycle.

Configurable and Extendable Avionics Solution

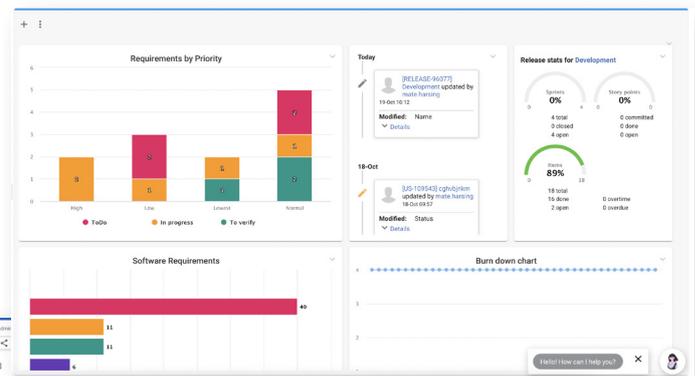
As an inherently flexible and highly configurable platform, our solution offers several integration points with widely used tools, and provides highly customizable artifacts and workflows. This allows you to tailor the system to your internal processes, and connect it with existing tools that you'll want to continue using. In addition to our integration with MS Office (Word and Excel round-trip export/import), ReqIF, IBM® Rational® DOORS®, Jira®, Jenkins, and Enterprise Architect to name just a few. REST and Swagger APIs allow you to simply create custom integrations. The platform is also connected to agosense and the Tasktop Integration Hub.

Data Analytics and Reporting

Our platform stores all your important production and historical data in its repository, from requirements through to testing and delivery. Its powerful data analytics and reporting features help make sense of all that data to unlock valuable insights. Search and filter data using queries, visualize it using preconfigured charts and diagrams, send automated reports, and analyze data to support decision-making. Using shareable, exportable automatic data visualization enables you to monitor business KPIs effortlessly, letting you oversee, improve and optimize processes. Dashboards and reports with benchmarks, visualized data, and production insights may be simply created and shared with others.



▲ DO-178C documents



▲ Data Analytics and Reporting

Our solutions are successfully used by:



Explore Codebeamer's Aviation solutions in action

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