ENEA: THE PROVEN LEADER IN SAFETY CRITICAL AVIONICS SYSTEMS
For over 40 years, we have been one of the fastest growing avionics consulting companies in the world. Today our avionics capability in system engineering requirements, architecture design, code verification, certification, DO-178B/DO-254 processes/training and DER approval makes us the supplier of choice of leading prime and subcontractors in the global aerospace industry.

Our deep knowledge of both hardware and software design enables us to functionally partition a system and make intelligent trade-offs on critical issues. With the help of our experienced team of consultants we can ensure strict compliance with the relevant standards for your project, accelerate development and help you deliver on time and within contract budget.

**SPECIFIC AVIONICS CAPABILITIES INCLUDE:**

- FMEA and FHA safety analysis/assessments
- Requirements definition
- Architectural analysis/definition
  - Systems/Software Design, Code & Test (functional and structural)
- Certification Qualification and Certifiability - Custom or COTS components
- RTL Design, RTL Advanced Verification/Synthesis, Place & Route, In-System Testing
- Military to Commercial transitions and vice versa
- Project Roadmaps: Defining all your work steps, risks/mitigation strategies, and detailed process/tool/schedules for all phases of the avionics lifecycle
- DO-178B/DO-254 Training
- DER review/approvals with our in-house DERs and corresponding ACO coordination (see related links in our website)

**ENEAA EXPERTISE WAS USED TO DEVELOPE THESE AVIONICS SYSTEMS:**

- Flight management and navigation systems
- Electrical power & distribution systems
- Proximity sensing systems
- Satellite and radio communication systems
- Ground proximity and TCAS systems
- Cabin entertainment systems
- Anti-vibration systems
- Cargo systems
- Over 50 other specific systems
PROFESSIONAL SERVICES ENGAGEMENT MODELS

Each of our customers has different needs when it comes to consulting engagement models. At ENEA we pride ourselves in working with our customers to figure out the best model to suit their needs. We handle everything from individual consulting services to on-site staffing, to peak project staffing, to education and training.

**Staff Augmentation**
- Project work performed at customer facilities
- Flexible work assignments
- Evolving requirements
- Unique SW/HW Roles
- Customer provided project management

**U.S.-Based Full Turn Key Services**
- Firm requirements
- Defined project scope & deliverables
- Work performed at ENEA’s US based development centers
- Expert project management provided by ENEA

**International Blended Engagement**
- US Based Project Leads
- International Engineers in Romania, Sweden, Mexico or India
- Defined transition points
- Requirements well understood.
- Blended Rates

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**CUSTOMER SUCCESS**

Boeing on site staffing:
Boeing utilizes Enea’s expert engineering resources for multiple programs, utilizing their knowledge to upgrade Air Force avionics. Enea’s responsiveness to requests and ability to provide the right talent has made this relationship strong over the many years of service.

"The Enea consultants have been a part of the team and I expect them to be here for more projects. I have them meet and make presentations to our clients. They blend in seamlessly."

-Tim Farmer, Director Avionics Boeing C-17
SYSTEM SOFTWARE HARDWARE VERIFICATION

Enea performs rigorous verification and validation of real-time software, hardware and systems.

The same successful techniques we use in-house on Enea-developed software are also applied to clients’ software/hardware projects. Many clients choose Enea to independently verify their software, hardware or systems. They have found that this independent verification increases objectivity and productivity.

The degree of testing required depends upon the application, criticality, and development processes used. Enea's activities include a combination of testing coupled with the latest V&V techniques. Enea's in-house test processes and training yield the highest productivity for cost-effective solutions.

CUSTOMER SUCCESS

Network Interface Controller SW Verification Project: Honeywell faced a time-critical verification project in order to complete an FAA certification. They looked to Enea to provide verification activities as well as certification consulting to bring this important project to completion in time to meet customer expectations. Off site Enea activities were coordinated with customer's on site team resulting in consistency of artifacts integrated into Honeywell’s infrastructure.

“Enea's responsiveness allowed me to put people on tasks and drive to completion essential activities necessary for our certification.”

- Maria Snyder, Software V&V Manager

Honeywell

KEY ASPECTS OF ENEA’S TESTING CAPABILITIES INCLUDE:

- Requirements-to-test traceability
- Requirements testability analysis
- Unit/Module testing
- Requirements validation
- Structural Coverage Testing (including MCDC)
- Test automation
- Simulation
- Software integration testing
- Software/hardware/systems testing
- Custom and off-the-shelf automated test environments
- Test tools and repeatable testing
- Test plans, procedures, and reports
- Enea's testing activities ensure that the target systems perform as expected
- Our proven techniques have helped many of the leading names in industry deliver correct systems on schedule
- Code Linting, Advanced Verification Methodologies, CDC analysis
DER SERVICES

Enea is one of the largest independent high-reliability software companies performing Federal Aviation Administration (FAA) certification. Our full-time engineering and consulting employees comprise over 2000 person years in avionics alone. Avionics comprises 50% of Enea’s business base. Accordingly, Enea understands the need for expert, in-house, full-time FAA Designated Engineering Representatives (DERs).

Most avionics or FAA related software/systems require oversight and approval by registered DERs. Enea’s in-house DERs have extensive experience in all phases of the avionics life-cycle including:

CERTIFICATION APPROACHED FOR CUTTING EDGE TECHNOLOGIES

- Level A through E Systems, Software and Complex Electronic Hardware DERs
- Certification Strategy/Roadmap (DO-178B and DO-254)
- Development Process Reviews, Conformity Reviews
- Evaluation of certification level and PSAC/PHAC preparation, approval and ACO submissions
- FAA presentations & representation
- Application of DO-178B/DO-254 to all project phases
- Re-use of Enea’s DO-178B/DO-254 compliant processes to your application
- Certification and certifiability of commercial off-the-shelf (COTS) software, systems & components
- Cost-effective process and development improvements to ensure FAA compliance/approval
- DO-178B/DO-254 Training (Public or Private sessions), Basic to Advanced.
- Advisory consulting to ensure your project meets FAA requirements and is expediently approved
- Preparing for DO-178C, DO-278A and Technical Supplements (Enea is on the vanguard of Certification trends and updates)

CUSTOMER STORY

Enea DER Services:
- Level A Sys/ SW & AEH
- 20+ years in embedded SW/HW
- 12 years FAA
- Committee member
  - DO-254
  - DO 178C
- 12 years FAA Experience

Enea’s DERs provide professional, reliable certification services for our clients’ aviation related products. Our DERs provide timely, advance assistance to ensure your products are certified expediently and with minimal rework. With proven success and close relationships with national and local FAA offices, our certification and DER activity is of the highest quality.
ENEA PROCESSES FOR DO-178B

One of the most rigorously developed software in the world is avionics. With lives at stake only the highest quality software is used in avionics systems. Enea has based its internal processes on the Federal Aviation Administration (FAA) recognized standard RTCA DO-178B.

Enea's DO-178B Processes are meant to provide the template/framework for customization to meet the software process objectives of DO-178B. The Enea processes provide the basic elements of an avionics project compliant with DO-178B and a typical Enea client tailors (or hires Enea to tailor) these processes by five to ten percent to meet their own project needs.

The three basic DO-178B software lifecycle processes are:

- Software Planning Process
- Software Development Process
- Correctness, Confidence and Control Processes

The Enea DO-178B Processes encompass these three areas.

ENEA HARDWARE PROCESSES FOR DO-254

Enea's DO-254 Processes are meant to provide the templates/framework to meet the hardware process objectives of DO-254. Many companies are finding that their current design now requires many changes in order to comply with DO-254. The number one issue with taking a prototype design through certification is setting good requirements and being able to track those requirements through the design process. ENEA can help companies with this as well as recommend design methodology/tool changes that can help the processes that can directly impact quality, productivity and certification.

The Enea processes provide the basic elements of an avionics project compliant with DO-254:

- Project Management
- Architecture
- Verification and in-system testing
- Requirements writing & traceability
- Hardware Development Processes
- Documentation and communication

Visit www.enea.com to view a list of Enea's process documents or checklists available for licensing.
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REVERSE ENGINEERING SOLUTION FOR YOUR DO-178B/DO-254 PROJECTS

ENEA provides reverse engineering and design recovery for customers that would like to take prototype designs or legacy designs through the DO-178B/DO-254 certification process.

ENEA’S REVERSE ENGINEERING SERVICES CAN ASSIST COMPANIES WITH:

- Documentation of existing designs that have not gone through DO-254 certification.
- Understanding legacy products that were designed by engineers no longer with the company.
- Redesigning products to DO-178B/DO-254 standards that were previously designed to another standard (e.g.-2167).
- Creating software or RTL libraries from previous designs that can be used for new DO-178B/DO-254 projects.

DON’T REINVENT THE WHEEL: LET ENEA SERVICES’ EXPERTISE, CAPABILITIES AND RESOURCES HELP TO GET YOU WHERE YOU ARE GOING WITH SAFETY AND QUALITY:

- Methods for software design recovery from an existing system.
- System definition and requirements analysis.
- In-House libraries and proprietary processes.
- Unit/Module Testing, Robustness and Regression Testing.
- Rigorous well defined process in place (Plans, Templates, Tools, etc.)
- Access to the experts (averaging 10+ years of experience)
- Strong working knowledge of DO-178.
- DER support for successful certification of safety-critical applications.