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SOFTWARE DEVELOPMENT & VALIDATION FOR FLIGHT ENGINEER DATA PANEL DISPLAY

Overview

Industrial Electronic Engineers, Inc. (IEE) selected CERTON to perform DO-178B software development, validation, and verification activities for a Flight Engineer Equipment Information and Data Entry Panel. Project management, software development, and software quality assurance efforts for this project resulted in more than 1600 engineering hours.

The Challenge

DO-178B software considerations in airborne systems and equipment certification is a rigourous and time consuming process. CERTON was challenged with completing all software development and certification efforts for the Flight Engineer Data Panel while operating under a firm-fixed price contract. Many DO-178B projects fail to meet schedule and budget requirments if exeprienced Validation and Verification (V&V) teams are not involved. This project required compliance with DO-178B and MIL-STD-1839 guidelines. IEE established a goal to get the display to market on-time and CERTON was selected for their proven experience in embedded software and electronic hardware certification. CERTON was tasked with defining the roles, responsibilities, deliverables, and processes required for product compliance.

CERTON's Solution

High and low level requirements for the system were captured in text and model-based form using CertSAFE™. Model-based requirements allowed developers to concisely and unambiguously describe the intended operation of the software to be written. For code development, CERTON utilized the CertSAFE standard library components to reduce software development time through reuse of code that implements primitive model blocks such as Boolean logic functions, timers, and mathematical functions. The CertSAFE standard library is written for portability across a variety of platforms and is fully tested to allow seamless integration into avionics of any design assurance level up to Level A.

For Black Box verification testing, CERTON used a fully automated test approach of the display unit made possible by CertSAFE in combination with CertBENCH™ Line-Replaceable Unit (LRU). These solutions allowed engineers to develop test vectors with CERTON patented technology to streamline the verification process, simulation, and debugging. Standardized test cases and procedures were automatically generated and compatible with CertSAFE Executor and CertBENCH automated Black Box test environment solutions, LRU and Programmable Logic Device (PLD). The end result for the customer was a complete solution for DO-178B validation and verification. The activities were completed by CERTON in accordance with IEE procedures and specifications to reach all identified milestones.

Key Business Benefits

CERTON was able to apply proven tools and technology to reduce the time-to-market for the IEE Flight Engineer Data Panel. CertSAFE and CertBENCH provided an end to end solution for requirements capture and automated verification testing. This was combined with CERTON's engineering experience to successfully manage and execute DO-178B processes developed by the safety-critical working group, RTCA. All deliverables were provided to IEE for a safe, reliable system.

Project Review Phases

- System requirements review
- Preliminary design review
- Critical design review
- Test readiness review
- Design readiness review

About IEE:

Industrial Electronic Engineers, IEE, has been a trusted provider of enhanced displays for military, industrial and retail applications for over 70 years. From rapid prototyping of custom designs to full-scale production runs, IEE's factory in Van Nuys, CA produces innovative displays with advanced features like multi-mode backlighting, optically bonded touch screens and lightweight, ruggedized enclosures. IEE's direct control of critical process steps reduces costs, decreases production lead times and improves life cycle management. IEE display products are found in virtually every environment and application worldwide. For more information: visit http://ieeinc.com/.

About CERTON:

Over the last decade, CERTON has established an identity of unparalleled safety critical certification solutions in the aerospace, medical device, and transportation industries. CERTON has internally developed tools and exclusive technology designed to streamline approvals of safety-critical systems, software, and complex hardware. These competitive advantages allow CERTON to minimize the time-to-market of customer products while providing a Firm Fixed Cost to its customers. CERTON provides expertise in all phases of systems, software, and complex hardware product design life cycles to support rapid approval of safety-critical customer products.

About Cyient

Cyient (Estd: 1991, NSE: CYIENT) provides engineering, manufacturing, geospatial, network and operations management services to global industry leaders. We leverage the power of digital technology and advanced analytics capabilities, along with domain knowledge and technical expertise, to solve complex business problems. As a Design, Build and Maintain partner, we take solution ownership across the value chain to help our clients focus on their core, innovate, and stay ahead of the curve.

Relationships lie at the heart of how we work. With nearly 14,000 employees in 21 countries, we partner with clients to operate as part of their extended team, in ways that best suit their organization's culture and requirements. Our industry focus spans aerospace and defense, medical, telecommunications, rail transportation, semiconductor, utilities, industrial, energy and natural resources.

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