VECTOR

Vector Software Global Services Implements VectorCAST Test Framework for IEC 61508 Compliance

Case Study - Moore Industries

The Customer

Established in 1968 and privately held, Moore Industries is a world leader in the design and manufacture of interface instruments for industrial process control, system integration and factory automation. Functional safety products include temperature transmitters, alarm trips, isolators, relay repeaters and other components for use within the process industry. Moore's typical customers include oil refineries and manufacturing plants. Most of the company's software development is conducted at its headquarters in North Hills, California.

The Challenge

Moore was faced with a functional-safety test mandate that required them to test the embedded software for a dual-input temperature transmitter. This component required intense unit and integration testing to comply with the functional safety standard IEC 61508. The company had very limited resources to conduct the testing in the desired amount of time. Additionally, safety requirements demanded that an independent third party conduct the testing. Moore researched outsourcing options for the test project. They discovered Vector Software. Interested initially in Vector Software's unit test and code coverage tools to automate testing, Moore was introduced to the Vector Software Global Services (VSGS) team who proposed to do all of the required testing as a service. Vector Software was bought on-board to test setup, development, execution and reporting.

The Solution

Working with its services partner CRITICAL Software, the Vector Software Global Services team put together a Project Management Plan (PMP) during the first week of engagement. A PMP establishes the working relationship, objectives, communication protocols, status reporting and detailed completion criteria, so that each project maximizes success probability as defined by Moore. The PMP also ensures Vector Software has a good arrangement with any providers or partners, such as CRITICAL Software, who also follow the same PMP.

For this project, Moore provided approximately 25,000 lines of executable code in groups of 5,000 LOC for each two-to-three week period. Weekly status reports were submitted to the company's management every Monday morning, sharing project details and progress updates. For ongoing communication and project management, the software tool JIRA was used by all parties. Following successful completion of testing and baselining the initial project, Moore now uses the VectorCAST test automation platform to test all new functionality and augment the original testing done by the Vector Software Global Services team proving that 100% requirement and decision-condition coverage metrics are achieved. Any coverage not achieved because of anomalous conditions is satisfied with a unique rationale. The company also uses VectorCAST/C++ for unit esting and VectorCAST/ Manage to provide aggregated analytics on all regression tests being performed. Tests are being run via PC due to speed and simplicity, as well as on target boards to get binary validation. VectorCAST/RSP is being used for on-target/simulator unit testing of the PIC 24FJ256GA106/Microchip C30 v3.31 compiler.

The Results

When Moore initially considered undertaking this project using internal resources, they quickly realized it would take at least eighteen months to complete. By utilizing the Vector Software Global Services team, Moore Industries reduced this to a total project time of just four months.

"Even if we hired people, we wouldn't have been able to hire enough people to provide this in the time that we wanted to be able to produce it", stated Charles Larson, Director of Technology and Software Development at Moore Industries. Utilizing Vector Software's Professional Services allowed Moore's software development team to focus their efforts on developing application code and systems/hardware-level testing instead of writing, managing, and reporting on software unit tests. The Vector Services team was able to "baseline test" the current application and provide Moore with direction on how to use the VectorCAST tools to become self-sufficient for future testing requirements. "All the way down the line [the testing project] was on time and on budget. We were really impressed with how it was managed", added Larson.