CASE STUDY

Successfully Instrumenting a Regional Jet for Flight Testing with a New Team

CURTISS-WRIGHT

Challenge

- Lack of in-house flight test experience
- Needed a complete system but had no system engineer experts to define requirements
- Needed a simple, proven systems solution

Solution

- Extensive training and quick, responsive support was provided
- System architecture definition was outsourced to instrumentation vendor
- Selected a vendor based on recommendations from other flight test centers and aerospace primes

Results

- Engineers were educated on how to use a flight test instrumentation system
- Organization received a fully integrated system that performed as required
- Team obtained what they needed to achieve their goals

Challenge

A major aircraft manufacturer needed to plan and operate a flight test campaign for a new regional airliner. The organization did not have an in-house capability to do this and instead typically outsourced this to a dedicated flight test provider. The organization decided it wanted to build up a flight test capability in-house and thus embarked on a project to split the flight test campaign into two groups – the first being the traditional flight test provider, the second the new in-house team.

The challenge they faced was they wanted their in-house team to be homegrown, rather than buying in talent. This meant that there would be no large pool of flight test experience for the team to draw on. This also resulted in a further issue - the lack of in-house system engineering skill sets to define the instrumentation system itself. A large data acquisition system was required and thus it was important that the chosen system was well proven and relatively simple to install, manage and use in the field.

The ADSR-4003 family supports networked data, high-speed and high-definition video recording while also featuring a built-in file server capability.

Solution

The organization hired a team of bright students to create a pool of talent to build up the in-house capability. They then looked to work with a partner who could both supply the necessary flight test instrumentation hardware and help upskill their staff. They consulted with several flight test centers and other aircraft manufactures to seek recommendations for a partner before deciding to select Curtiss-Wright. Curtiss-Wright has a wealth of in-house experience in all areas of flight test instrumentation from system design to data analysis techniques. In fact, Curtiss-Wright was one of the first flight test organization in the world having test and flown the Wright Flyer in 1903.

The aircraft manufacturer worked with Curtiss-Wright to operate a series of training sessions. The new team was educated about flight test instrumentation and taught all the necessary skills to manage and use the chosen system. Expert support, both on and off site, was provided to help resolve any queries or issues quickly. Consultants within Curtiss-Wright were able to advise the aircraft manufacturer about the system requirements and created a suitable architecture that would meet the needs of the flight test articles. The system selected included a large number of data acquisition units, rugged Ethernet switches, high speed cameras, high definition cameras, combined Ethernet and video recorders and a switch fabric for feeding data to operator consoles.

Results

The short term result of the project was that a flight test instrumentation system was successfully selected, tested, installed and working for the flight test application. The project goals were met without any significant issues and data is being gathered that will help the aircraft gain certification. A longer-term result of this partnership was that a team of young inexperienced engineers gained the knowledge and training to undertake many more flight test instrumentation projects.

Curtiss-Wright is becoming more aware of instances where skill gaps exist within organizations new and old. One solution to this is to hire experienced engineers, but this may not be possible or realistic and it may be a better plan long term to instead lean on the expertise that partners can provide and upskill new engineers to create indigenous talent.

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