Powerful Recorder Solution Goes Beyond New Rotorcraft Regulations

Challenge

- Large volume of data needed storing in crash-protected memory
- Solution had to meet new regulations, including mandatory image recording
- Recorder had to fit into a small space on-board rotorcraft

Solution

- Modern Fortress™ flight recorder with sufficient storage capacity and a high-speed interface
- ED-112A compliance and image storage capability
- Compact single-box solution

Result

- Solution provides 200x storage capacity of existing solution
- Rotorcraft platform now meets all jurisdictional recording regulations
- SWaP-optimized solution features reduced operational overhead

Challenge

A rotorcraft manufacturer has customers with rotorcraft that must operate in a jurisdiction that introduced new image recording requirements following a helicopter accident. These requirements included cockpit image recording and meeting EUROCAE Minimum Operating Performance Specification (MOPS) ED-112A, ED-155, or equivalent standards.

The manufacturer wanted to upgrade its existing flight recorder (FR) to meet these and other anticipated aircraft regulations. Additionally, an FR with expanded capabilities and storage capacity would enable customers to collect information to support aircraft maintenance programs.

Since space is at a premium on the rotorcraft, the new FR had to be as compact as possible. Use of a single-box solution, instead of separate FR and flight data acquisition unit, would significantly reduce system size, weight and power (SWaP) requirements while lowering installation and operational complexity.

Solution

The aircraft manufacturer's ideal solution was to select Curtiss-Wright's Fortress™ compact flight data, voice, datalink, and image recorder. Fortress features storage capacity 200x times larger than the legacy FR. Its high-speed interface can deliver vast amounts of maintenance, voice, and image data, to the crash-protected memory. The Fortress product line meets all current regulations. Although not mandated for rotorcraft, Fortress capacity exceeds the minimum 25-hour cockpit voice recorder (CVR) requirements and includes a provision for a 2-hour image recording. The unit's replay software was upgraded by Curtiss-Wright to capture and replay the additional parametric flight data, cockpit audio, and image data needed to satisfy the new requirements.

Believed to be the industry's first FR to meet the demanding requirements of EUROCAE ED-112A, aircraft data captured and stored by Fortress drives more efficient operations, allowing for additional predictive maintenance and real-time playback of data and voice communications. The unit's certifications include ETSO-C123c, ETSO-C124c, ETSOC176a, and ETSO-C177a.

Results

The upgraded flight recorder allowed the aircraft manufacturer to deliver a rotorcraft to its customers with the capacity to capture and store operational and maintenance data. This additional functionality eliminated the need for separate hardware to perform tasks such as health and usage monitoring (HUMS), condition-based monitoring (CBM), and flight data monitoring (FDM). Fortress data is quickly downloadable via an Ethernet connection (using a built-in webserver). No proprietary software or service agreement is needed to access the data.

The ED-112A-certified recorder, with the application's required image capture functionality, future-proofs the rotorcraft against current and some anticipated regulations. This includes the United Kingdom's Civil Aviation Authority (CAA) specification No. 23 — satisfying an additional requirement the aircraft manufacturer was also targeting.

By choosing the compact, multi-function Fortress FR, the manufacturer can free up valuable space for other equipment, eliminating the need for separate maintenance recording devices. Additionally, the unit's Ethernet image data recording functionality enabled the manufacturer to accommodate IP cameras in the future, further future-proofing the FR system.

Figure 1: Curtiss-Wright's Fortress