Helicopter Flight Data Monitoring (FDM) systems are powerful aviation safety tools. For Helicopter Air Ambulance operators in the US, equipping aircraft with FDM systems will soon be a requirement. Investing in the right system is a difficult decision; operators must select a system that satisfies the mandate, but also improves their organization’s safety systems, productivity and profit margin.

Helicopter FDM
Helicopter operators supporting oil and gas producers in the North Sea pioneered the use of FDM. These early adopters of FDM have proven that these systems are indispensable and properly managed flight data analysis programs not only enhance safety, but also have a positive impact on improving maintenance, operations and training.

Today, the global offshore helicopter transportation industry embraces FDM as a best practice. FDM is a cornerstone of modern Safety Management Systems (SMS) and provides actionable intelligence across the entire enterprise to improve operations, reliability and ultimately profitability. Integrated FDM systems are now standard on all new medium and heavy offshore helicopters. The offshore industry – based on lessons learned – demands more, not less, from the next generation of FDM systems.

Much of the focus on larger helicopters was based on contractual requirements from the “oil majors” and the perception that equipping smaller aircraft with flight recorders was neither practical nor technologically feasible. Now, these perceived hurdles have been addressed by leveraging technology to create functional stand-alone recorders or integrated systems that combine many functions such as data acquisition, on-board analysis, data transmission, satellite communications and flight following and other features. These new systems enable FDM for operators of lighter helicopters, while adding other features to create a greater value proposition.

“HEMS rule” recap
On April 23, 2014, the FAA made final a long anticipated rule that affects Helicopter Air Ambulance (HAA) operators in the US. The overarching component of this new rule is a requirement for HAA flights with medical personnel onboard to operate under 14 CFR 135 (135.1, 135.601) or “part 135,” the rules that govern smaller commercial operators. HAA flights under Part 135 must meet a number of new operational requirements and equip fleets with safety equipment, such as radar altimeters, terrain awareness systems and FDM systems. This new set of rules satisfies or partially addresses a number of recommendations by the US NTSB and industry groups to enhance HAA safety.

According to the final FAA rule, “After April 23, 2018, no person may operate a helicopter in air ambulance operations unless it is equipped with an approved Flight Data Monitoring System (FDMS) capable of recording flight performance data.” Justification for the ruling includes the promotion of operational safety and the ability to provide critical information to investigators in the event of an accident.

A missed opportunity
The rule satisfies a NTSB recommendation to install flight data recording systems (A-06-17), but falls short of establishing structured FDM programs to identify deviations from established norms and procedures (A-09-90). In addition to NTSB support, several industry groups and operators support establishing a formal FDM program for HAA operators. As an example, the International Helicopter Safety Team (IHST) recommends “the utilization of FDM systems such as HOMP or FOQA to evaluate flight operations and to address unsafe or undesirable flight crew habits.” Likewise, other industry comments collected during the rulemaking NPRM process supported employing proactive FDM/FOQA programs; these organizations included Life Flight of Maine, PHI Helicopters, Airbus Helicopters, HAI and the Global HFDM Steering Group.

What is FDMS?
The final HAA rule related to FDMS (14 CFR 135.607) established the requirement to install a flight data recorder, but did not provide many details other than specifying the device must record “flight performance and operational data.” 135.607 further outlines the electrical power requirements such as the source and when the FDM must be powered. The rule does not require data collection (one component of a FDM program) or prescribe standards or parameters for data collection; this guidance is contained in FAA Advisory Circular AC 27-1B. During 2014, the guidance in “draft” versions of AC 27-1B evolved from “slightly specific to vague.” In its current form, only a handful of recorded parameters are...
required (Airspeed, Altitude, Heading, Vertical Acceleration and Time).

What's next?
HAA operators now face a dilemma; do they simply go with minimal equipage to satisfy the FDMS requirement or follow the lead of the offshore operators and adopt formal FDM programs backed by large datasets. Successful FDM programs – from airlines to large offshore helicopter operators - leverage large amounts of data to benefit the entire enterprise. The value of each additional parameter is exponential to the organization when employed in an effective FDM program; from safety to maintenance and to back office functions such as operations and dispatch. A rich dataset provides many opportunities for organizational enhancements. Adding other functions such as flight following and satellite communications further adds value to a required investment.

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