STAR NAVIGATION REPORTS AIRCRAFT ANOMALIES BEFORE THEY BECOME PROBLEMS

by James Careless

In flight safety, the rule of thumb is simple: The sooner operational problems are identified and dealt with, the better the chances for a safe landing. This is why an onboard flight system that immediately alerts ground-based engineers when components start exceeding their operating parameters makes such good sense. By identifying and responding to anomalies early, operational problems can be tackled before they threaten the safety of passengers, flight crew and aircraft.

This is the thinking behind ISMS, the Inflight Safety Monitoring System made by Star Navigation Systems Group of Toronto. Consisting of a small avionics box and software that connects to the aircraft's black box data feed plus 14 other user-specified devices, the ISMS's mission is to report anomalies as they happen. The reports are compiled into fault reports that are transmitted over the aircraft's communications system – VHF radio or satellite – to the aircraft operator's corporate computer system. From here, designated engineers are alerted about the anomalies by SMS message, page, phone, and/or e-mail. They can then log onto the operator's LAN to see what's happening on the flight, and decide what should be done about it.

"Let's say I'm the operations manager responsible for a certain flight, and I happen to be in Singapore attending a conference," says Viraf Kapadia, Star Navigation's chairman and CEO. "No problem; where I am on the planet, I can be reached by phone, e-mail, page, or SMS message. As soon as I receive the alert, I can go to any Web-connected computer and log onto my password-protected ISMS database. I can see what's happening on the aircraft; alert other experts for immediate consultations if necessary, and advise Operations as to whether the flight should land now or continue on to its original destination. Once the aircraft arrives, a ground crew can be ready and waiting to service the aircraft immediately; thus minimizing AOG delays."


Viraf Kapadia, Star Navigation's chairman and CEO

Basically, ISMS is an early warning system; one that calls for help before things can go seriously wrong. A case in point: Imagine you're flying over the ocean when a red light on the panel indicates an overheating engine. All you can do at this point is either shut the engine down or risk a fire.

Contrast this dilemma with the ISMS box sensing the engine temperature starting to rise above normal parameters and alerting ground engineers to this trend, long before the red zone has been breached. Both the ground and the pilot get time to

analyze the trend before the engine shutdown/fire risk decision has to be made. There may even be enough time to try lowering engine temperature by throttling the engine back; an option that may cause the flight to arrive late, but still intact and at destination.

"A second scenario where ISMS can make a difference is when a single bird hits a turbine engine's fan during takeoff," Kapadia says. "With existing monitoring technology, such strikes usually go undetected. The damaged turbine blades stay in service creating a risk of an in-flight failure later on, followed by an expensive engine overhaul down the road. In contrast, ISMS would note the single spike in system performance caused by the strike. Even if it were not enough to warrant an alert, ISMS would note the spike in its regular end-of-flight report. This report would alert ground crew to inspect the engine, giving them the chance to make a minor repair now instead of a costly overhaul later."

The end-of-flight report's parameters can be customized by the operator. This means that they can not only monitor overall aircraft performance, but also keep an eye on how the aircraft is being flown by different pilots.

This flexibility can be particularly helpful for aircraft leasing firms, Kapadia notes. "Using ISMS, leasing companies can keep a close eye on the performance of their leased aircraft without having to send inspectors to do on-site checks," he says. "When a recurring problem arises, they can inspect the data to see if it is occurring when a specific pilot is flying the aircraft. As well, performance anomalies can alert leasing companies to inadequate aircraft maintenance long before their property is irreparably damaged."

Taken a step further, ISMS data could be used by responsible operators to negotiate discounts with their insurance brokers, Kapadia says. "If you can prove that your planes are more reliable than the industry standard, then underwriters are bound to take notice. Imagine: A 10% discount on a single aircraft's $2.5 million premium could save you $250,000 annually. This would cover the cost of installing an ISMS after the first year!"

Clearly, the ISMS concept makes good sense. This is why India's SpiceJet Airways is equipping its fleet of Boeing 737-800s with ISMS, and is paying Star Navigation $9 million to do the job. Originally, the project was to be completed in 36-42 months, but SpiceJet recently asked Star Navigation to get it done within two years. Kapadia is happy to accelerate the ISMS installation, because "we see it as a very clear indication of the traction and continued momentum we are experiencing."

Still, it remains to be seen if other operators will pay $240,000 per plane for ISMS-style preventive monitoring. If farsightedness and reason dictate their buying patterns, they will. But if they find themselves cash-strapped and fighting to survive into next week, they won't.