INFLIGHT CONNECTIVITY SHOWS MRO BENEFITS: LUFTHANSA TECHNIK

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The passenger benefits of inflight connectivity, particularly over broader bands like the Panasonic Avionics Ku-band system that Lufthansa brands as FlyNet, are plain. Yet the operational benefits are equally clear. Rather than just the ACARS or VHF narrowband pipes dribbling information back, the entire aircraft can be connected — “e-enabled”, as some call it — and can feed information back to maintenance operations on the ground.

“It’s making sure we have all the knowledge of each individual airplane and work with that knowledge on the ground side,” sums up Lufthansa’s Dean Raineri, project director, new aircraft and infrastructure development, aircraft maintenance.

“First of all,” Raineri says, standing under the shadow of an Airbus A380 undergoing maintenance in Lufthansa Technik’s Frankfurt hangar and talking about the benefits of connected aircraft, “it’s getting the knowledge of the status of the airplane. That’s where it starts and that’s what’s most important. Then it’s analysing that and preparing the information for further planning. The thing is to get that technical reliability and keep it high, and the other thing is to be an efficient planning process for our work on the ground and line maintenance.”

In terms of how connectivity — and particularly the new generation of connectivity with wider coverage and broader bandwidth — helps to achieve MRO goals, “it’s being alert, aware and prepared. It’s always being ahead of the system. That’s our major focus: always to be ahead in everything in our MRO business, which also then extends to our operation in the airline,” Raineri

says.

While ACARS offers real-time, air-to-ground communication capability, there are three major obstacles to using ACARS systems for comprehensive data communication: message size limitations, transmission cost, and interfacing with ground-based Internet networks, notes Ku-band connectivity provider Global Eagle Entertainment in a new White Paper.

“First, the information payload that is transmitted in an ACARS message is limited. A typical short-haul flight by a Boeing 737NG generates about 5 MB of avionics data. The teletype-based ACARS messaging format has strict formatting requirements and limitations, including a maximum message size ill-suited for detailed avionics reports.

“Second, service fees by ACARS networks can be a major fleet operating expense. Transmitting 5MB of in-flight data over ACARS could cost more than $4,000 over ground-based VHF networks; thus most airlines transmit only the most essential information required today.

“Third, legacy messaging systems are complex to integrate into airline information networks and decision support technologies. Third-party applications parse ACARS messages and convert data into structured information that can be used in modern Internet-based applications, but the legacy data formats limit ACARS utility.”

To realize the benefits of real-time communication, airlines need “channels free from ACARS’ structural, cost and integration constraints”, adds Global Eagle, and because broadband connectivity systems use Internet protocols, “they are ideal for sending aircraft information directly to data warehouses for storage and processing”.

Reliability of said systems is key, however. Raineri is part of the Lufthansa Group that works closely with original equipment manufacturers (OEMs) like Boeing and Airbus to ensure that connectivity systems — like many other parts of the airframes they construct — are more reliable than ever before, but also that design takes into account the requirements of actually maintaining them. Raineri’s job is also to ensure that the experience and expertise of MRO operators transfers back to the OEMs.

Lufthansa Technik is in “deep discussion with Boeing on the 777X — they’re in deep discussion with the airline community, not just with Lufthansa, to not only think about developing and building airplanes to get the reliability up on day 1. So sometimes we have to make sure they are connected to reality, and making sure the developed airplane and the design of that airplane enables us to have a reliable system and to maintain it in an easy way.”

So, no nasty surprises, in other words?

“The surprising thing is that we don’t have too many surprises,” Raineri laughs. “The airplanes are getting more reliable, and the systems are getting more reliable.”

“Modern aircraft show all kinds of fault messages and alerts. We transfer those in realtime from the airplane to our systems here on the ground, analyse them, and prepare on that basis. It’s like continuous health monitoring, to know which stage the airplane is and to be prepared for everything,” Raineri says.” It’s about predictive activities and predictive planning in the MRO world, trying to find out when a failure could occur and ground the airplane, but also being prepared to repair it: with parts, the right qualified personnel, the right ground time, and not to be surprised.”

Of course, Raineri, whose group has retrofitted a number of Boeing 747 and Airbus A380

equipment with radomes and satellite antennas, also needs to ensure that the connectivity systems function at the highest possible level of reliability for passengers: “Our main work is to make sure the systems are running at top notch. Technical reliability that extends to the passenger product is essential. We’re keeping an eye on the development of these systems to make sure that in operation we don’t run into any deep problems. We need to make sure our passengers really rely on it.”

With no sign that passengers are losing their appetite for inflight connectivity, and Lufthansa’s determination to serve up faster and more reliable Internet — as well as to leverage its FlyNet-branded connectivity into operational benefits — it’s clear that Raineri and his team have their work cut out for them.

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