

Blue sky thinking in **DATA ANALYSIS**

Ryanair has a deserved reputation for innovation - thinking and acting differently from the mainstream. It takes this same concept of 'thought leadership' into how it uses flight data, not just as an essential part of informing a required Safety Management System (SMS), but more in how it can help deliver extraordinary levels of operational performance and efficiency.

As one of Europe's true low cost airline success stories, Ryanair continues to expand, delivering some 86 million customers each year to 187 airports in 30 different countries. Its fleet today comprises over 300 aircraft, all Boeing 737-800s. By 2024, this will have virtually doubled with the arrival of 180 Boeing 737NGs and a further 100 of the new Boeing 737MAX with options for 100 more.

More aircraft means even more data to manage which is both a challenge and an opportunity to Director of Technical Services, Dr. John Clear: "We continue to grow and the challenge is how do you grow in an efficient way," he says. "Using data for flight safety is a given; put simply, without data, you do not have an SMS. What we are doing is using that data to think and act in a smarter way, to be more efficient and improve performance."

Big Advantage

For more than 10 years, Ryanair has been working with Teledyne Controls, the flight data acquisition and management business, to

extend the data it acquires from each aircraft to include additional parameters associated with engineering and flight operations. Ryanair obtains this parametric data for the full duration of each flight as opposed to snapshot data provided by ACARS.

Data relating to critical systems such as pneumatics (e.g. bleed temperatures), pressurization (cabin pressure, pressure rates, and the positions of outflow valves) and APU usage are all analyzed. Other analysis examples are measurement information on high-energy deceleration and altitude disagreements between the radio altimeters. Engine vibrations and exhaust gas alerts can also be measured, together with monitoring aircraft performance degradation.

"We are continuing to expand the number of measured parameters, and developing further applications," John says. "The big advantage with having all of the data on the ground, is that new applications can be developed within days or weeks without having to go through the long process of developing, certifying and deploying flight software. As soon as we see a recurring problem with any system, we quickly put an application in place to help us identify root cause, and also raise alerts to perform preventative maintenance."



Ryanair sees this as one of the key differentiators between data provided by Teledyne's WQAR (Wireless Quick Access Recorder) versus ACARS. "No other system provides a cost effective solution with the same quality and quantity of data," he adds.

Until July 2013, Ryanair was already achieving high data retrieval rates for between 97 - 98 percent of its flights: "We fly almost 500,000 flights each year, so even if we 'miss' only one percent of those, that still amounts to 5,000 flights which is not ideal," John continues.

Ryanair and Teledyne Controls therefore started to look at things in a different way. Previously, Ryanair would wait to be informed by automatic monitoring processes that an aircraft had stopped delivering data. Today, using jointly developed techniques, the daily retrieval performance of each aircraft is automatically compared against a rolling seven-day roster to identify any losses. In doing so it is possible to not only identify aircraft that have 'hard' failures, but also those that have intermittent transmission and data quality issues. This in turn allows preventative action to be taken at an early stage. Since changing the way it monitors data retrieval, performance now exceeds 99.5 percent capture, and

is often at 100 percent - a remarkable achievement by any measure.

Strong Partnership, Positive Results

Not surprisingly, the work that John and his team have been doing has come to the attention of his commercial colleagues. As part of a wider Business Intelligence Project, a single data record is available for each flight, including hundreds of precise details and measurements such as taxiing and take-off times, all of which allow the cost efficiency of each journey to be monitored and analyzed.

Ryanair's relationship with Teledyne Controls remains as strong today as it has always been with the two organisations working in a genuine partnership: "Teledyne is not a hardware provider or software supplier," John continues, "it is much more than that. We look to Teledyne Controls to provide us with fully integrated system solutions and support."

The airline recently announced that Teledyne will be supplying its DFDAUs and GroundLink® Comm+ system to all 180 of the new Boeing 737NGs that are currently in the process of being delivered.

And as for John's thoughts on the future? "We are looking forward to reaping the benefits of Teledyne Control's technology on our fleet and harnessing the power of data," he concludes.

"We are now using data to optimize how we use every one of our aircraft," said Dr. John Clear.



About RYANAIR

- 69 bases
- 187 airports
- 30 countries
- 1,600+ routes
- ~1,500 flights per day
- Newest fleet (< 5 Yrs)
- Current fleet of 300 aircraft all 737-800's
- Fleet growth to 520 by 2019
- 30 year Safety Record
- World's highest rated airline, BBB+ S&P, Fitch



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