



## **Ryanair Weather Diversions Madrid**

### **Synopsis**

On the 26<sup>th</sup> July 2012 three Ryanair aircraft (B737-800) inbound to Madrid diverted to Valencia due to Thunderstorms in the Madrid area. All three aircraft declared an Emergency (Mayday) when the calculated usable fuel on landing at Valencia was less than final reserve.

All three aircraft landed in Valencia without further incident.

### **Background**

As part of the investigation two Flight Operations Inspectors were directed by the Director Safety Regulation of the IAA to travel to Madrid to interview the Captains of the three Ryanair aircraft. In addition two Inspectors from AESA also requested to meet the IAA Inspectors in Madrid to review the events surrounding the diversions. The Base Captain for Ryanair in Madrid was also interviewed as was the Chief Pilot Ryanair.

All Flight Documentation relevant to the three flights was made available to the Inspectors by Ryanair.

### **Factual Information**

The latest forecast for Madrid issued on the 26<sup>th</sup> July at 1700Z indicated a 40% probability of Thunderstorms between the period 1800z and 2300z. This time coincided with the scheduled arrival times of all three flights.

The three flights were operating from LEPA (Palma), EGSS (Stansted) and ESKN (Skavsta).

### **FR2054, Palma – Madrid**

The crew on this flight had operated earlier flights from Madrid to Charleroi and then back to LEMD followed by a Madrid to Palma. The diversion occurred on the fourth sector from Palma back to Madrid.

The total Flight Plan Fuel required for the sector from Palma to Madrid was 5887kgs with a planned diversion alternate of Valencia. The crew elected to take 6500kgs due to the Southerly Runway configuration and the likelihood of cloud build-up 20-30 miles north of



the airfield at Madrid. Arrivals onto the Southerly Runways can be delayed as a result of extensive Radar Vectoring due to terrain north of the airfield.

The Captain commented that any holding inbound to Madrid would be east of the airfield which would be closer to Valencia if a diversion was required. He also commented that with Southerly winds any Thunderstorms that might occur would normally form north of Madrid close to the mountains.

The flight was given a direct routing toward Madrid with no holding inbound. The expected arrival was to Runway 18L. The aircraft was cleared to position TAGOM but declined due to a (Thunderstorm) cell in this location. Further vectoring was given towards 18L. Madrid then requested if the crew could accept 18R which they accepted. A brief for 18R was carried out.

The Captain elected to take control from the First Officer given the weather. The Crew became visual with the Runway approximately 25nm from touchdown. When the aircraft was fully stabilised a “Windshear” Warning was triggered. A Go-around was executed in accordance with Ryanair Standard Operating Procedures.

During the Go-around the aircraft was struck by lightning and a “Window Overheat” Master Caution was triggered. The Crew completed the QRH and climbed to 10,000ft to position RESBI (south-west of the airport) as directed by ATC. The Crew noted that the fuel was now 3000kgs with traffic holding at various positions. The Captain stated that he decided to divert to Valencia when the fuel remaining was 2900kgs.

ATC vectored the aircraft around the weather and this vectoring added approximately 40 to 50nm to the route to Valencia. On initial contact with Valencia the crew commented that the Controller seemed overloaded and did not respond to numerous calls.

The descent profile given to the aircraft left it high on the profile and the Controller cleared the aircraft to a holding fix. The Captain at this point declared an Emergency (Mayday) and was cleared for an immediate approach. The aircraft was however too high and further vectoring was required. The aircraft landed at 2108z and was escorted from the runway to the ramp by the fire services. The fuel on landing was 1029kgs. The Final Reserve fuel was 1104kgs.

#### **FR5998, Stansted – Madrid**

The Crew on this flight had operated an earlier flight from Madrid to Santiago de Compostela (LEST) and back to Madrid followed by a Madrid to Stansted and then back to Madrid. The diversion occurred on the fourth sector from Stansted to Madrid.

The total flight plan fuel for the flight from Stansted to Madrid was 8917kgs with Valencia as the Alternate. The Crew elected to take 9200kgs. In deciding this fuel load the Captain stated that he would have approximately 400 to 500kgs extra given that the plan included



fuel for the Northerly arrivals in Madrid when the Southerly runways were in use. He noted that when the fuel load was entered in the FMS it indicated that the extra fuel on arrival would be 400kgs. The handling agent in Stansted did not deliver an updated Met brief to the Crew as required by Ryanair policy.

The flight was given an early descent over Santander with an expected arrival onto runway 18R. Some CB's were displaying on the Weather Radar. The crew were advised of weather in the Madrid area but were given no details when they requested this on Madrid Approach. They were advised on Approach that departures had been suspended but that arrivals were continuing.

At approximately 18nm on approach the Weather Radar indicated severe weather approaching the runway from the South. The Captain decided to discontinue the approach as he noted that two aircraft ahead had performed a go-around.

The aircraft was vectored to the West with ATC extremely busy with other aircraft. The aircraft was cleared to position RESBI for holding but was unable due weather. The Captain stated that he requested a diversion when the fuel was approximately 2900kgs. The minimum diversion fuel required was 2664kgs. The routing to Valencia resulted in an additional 40 to 50nm over planned diversion route.

Valencia radar confused the Ryanair and Lan-Chile aircraft and this resulted in increased workload. The Captain stated that Valencia Control seemed overwhelmed with the traffic load.

The aircraft was advised that they were No 6 for the approach with a 10 minute delay. This displayed a landing fuel of 1200kgs and on this basis the crew declared an Emergency (Mayday). The aircraft was sequenced number 3 for the approach behind an Easyjet and a Lan-Chile A340 which had also declared a Mayday.

The aircraft landed 2120z in Valencia and was escorted to the ramp by the fire services. The fuel on landing was 1160kgs with a final reserve requirement of 1119kgs.

### **FR 5389, Skavsta – Madrid**

The crew had operated an earlier sector from Madrid to Skavsta and the diversion occurred on the sector back to Madrid.

The flight plan fuel load for the Skavsta Madrid sector was 11,828kgs with Valencia as the Alternate. The Crew elected to take an extra 20 minutes fuel and loaded 12,720kgs.

The flight was instructed to expect an approach to runway 18R and to anticipate holding inbound. The Crew noted the weather south of the airfield on the Weather Radar. The crew



declined a clearance to intercept the approach as there was significant weather all around the airfield. The Crew requested a go-around to the East of the airfield which was clear of weather at the time however ATC requested the Crew to standby. The option for routing East of the airfield was not possible by the time a clearance was issued by ATC. The aircraft was routed to the West of the airfield and climbed to 14,000ft.

The crew requested a diversion to Valencia when the fuel load reduced to 2600kgs. The minimum diversion fuel was 2588kgs. They were cleared to position MADUX to hold. The crew noted that another aircraft on the frequency was given an expected delay of 35 minutes. The Captain declared an Emergency (Mayday) at this point and was cleared direct to the Localiser from the North. There were a number of aircraft on the frequency. The aircraft was vectored for the approach and landed at 2129z with a fuel load of 1228kgs. The Final Reserve required was 1090kgs.

## **General**

In discussion with the AESA Inspectors they pointed out that with the Southerly Runways in use in Madrid delays regularly occur involving extensive vectoring and holding. They indicated that they would consider if a requirement should be put in place to require Operators to carry additional fuel in such circumstances. A similar requirement is in place for arrivals into London Heathrow.

The AESA Inspectors also noted the Crews comments with respect to the Air Traffic Management by Valencia ATC.

Ryanair policy in place when the diversions occurred with respect to the carriage of additional fuel states "Operational considerations may dictate the carriage of fuel in excess of flight plan fuel, even when not tankering. This is a matter for the exercise of the Captain's discretion. The Commander may carry up to 300kg more than FPL/Block fuel without explanation, actual plog fuel +300 kg, rounded up to the nearest 10 kg. Where departure fuel is more than 300 kg in excess of flight plan fuel an explanation for the uplift shall be recorded on the Voyage Report". (8.1.7.8.6 - OMA Issue 3 Revision 7 Dated 01/04/2011).

## **Conclusions**

1. The aircraft in all three cases departed for Madrid with fuel in excess of Flight Plan requirements.
2. The Crew diverted to Valencia with fuel in excess of the minimum diversion fuel depicted on the Flight Plan.
3. Diverting with fuel close to minimum diversion fuel in the circumstances presented on the evening in question was likely to present challenges for the crew. Initial



holding was to the Southwest of Madrid which increased the diversion time to the alternate.

4. The Crew declared an Emergency in accordance with EU-OPS when the calculated usable fuel for landing at Valencia was less than final reserve.
5. The Met conditions in Madrid were more significant than anticipated by the Crew when reviewing the Met Forecast. Consequently the additional fuel carried was influenced by the forecast.
6. Operations into a busy airport such as Madrid in Thunderstorm conditions with the associated traffic levels can add significant delays to all traffic.
7. Air Traffic Control in Valencia was under significant pressure with the number of diversions arriving in their airspace.

### **Recommendations**

1. AESA to review delays into Madrid to consider if additional fuel should be recommended or required to be carried in normal operations particularly when the southerly Runways are in operation.
2. Ryanair to review fuel policy and consider issuing guidance to Crew with respect to fuel when operating into busy airports with mixed aircraft operators and types particularly in poor weather conditions when diversions are likely.
3. Ryanair to consider including as part of its training program scenarios similar to those occurring on the above flights with particular emphasis on diversion management.