

ANALYSIS: MRJ readies for its ultimate test

September, 26, 2016

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Mitsubishi Aircraft is a Japanese company based in Nagoya, but its fate resides a three-hour drive east of Seattle, where most of the flight test campaign of the MRJ regional jet programme will occur.

The airframer is counting on its facility at Moses Lake's Grant County International to bring its MRJ programme forward. The pressure is one: the programme's tight schedule can ill afford another delay.

Four of five flight test aircraft will be at Moses Lake. Here the jet will endure the trials and tribulations of flight testing and certification.

FALSE START

But just getting FTA-1 to Seattle has proved more challenging than Mitsubishi had anticipated. What was supposed to be a quiet, low-profile ferry flight to the US ended up making headlines when the aircraft was forced to abort the mission twice in two days over the weekend of 27 August.

The first flight lasted less than an hour before part of the air management system stopped due to "trouble with the monitoring function". Back at Nagoya, the manufacturer found an issue with the system's sensor.

Sensor replaced, the aircraft tried again to reach Seattle the following day. This journey was cut short after just 2h 15min, when a similar issue was detected.

A week after the failed attempts, Mitsubishi said it was still working to "uncover the cause" but that the anomalies detected were not due to faulty systems or suppliers' fault. Two weeks later, asked what was the root of the problem, Mitsubishi would only say that it is not in company

policy to disclose, but that the issue has been resolved. At press time, FTA-1 was still stuck in Nagoya.

When the aircraft eventually reaches Moses Lake, the Mitsubishi team will breathe a big sigh of relief, not just because the jet has successfully managed the 8,000km journey, but also because flight tests will be able to start proper.

PRESSED FOR TIME

Embarrassment aside, failing to reach the US in August strains the programme's schedule. Some industry watchers expect the MRJ to suffer yet another programme delay.

Early this year, the aircraft spent more than two months on the ground for structural reinforcements and system software upgrades. It had to strengthen the jet's wing roots and fuselage frame above the centre wing with additional plates. It also fell behind on some tests due to uncooperative weather in Japan.

This is precisely why Mitsubishi pushed so hard to bring forward FTA-1's ferry flight to the US in the summer, ahead of its fourth quarter schedule. The hope is to accelerate the flight test programme, providing a buffer for technical and certification issues that will almost certainly arise.

"Because of the weather and some unexpected trouble, we are behind our schedule, so we need to recover such a delay by making the ferry flight earlier than originally planned," Mitsubishi president Hiromichi Morimoto told FlightGlobal at the Farnborough air show in June.

"I think we can catch up during the flight test campaign in the US... the type certification is also partly behind schedule but still it's in a range where we can recover."

Mitsubishi's original plan was for FTA-1 and hopefully FTA-2 to be in Seattle by August. Flight tests were supposed to start three weeks after arrival. The third and fourth aircraft were to arrive by end-September.

EYE ON MID-2018

Still, the MRJ has slightly over a year to complete its flight test campaign and certification, if it intends to stick to a mid-2018 delivery to launch customer All Nippon Airways.

Ray Jaworowski, senior aerospace analyst at Forecast International, believes the failed attempts to bring FTA-1 to Moses Lake won't hurt customer perceptions - as long as its delivery schedule remains unaffected.

"Real concern would only take hold should some major technological problem occur, which has yet to happen," he says, adding that the manufacturer has been transparent about the progress of the programme, and must continue to be so.

Its most recent schedule delay, announced in December 2015, relinquished its one year entry lead over Embraer's E190-E2, which is built on a trusted platform that has been in service for over a decade. That said, it still has a head start over its most direct competitor, the E175-E2, service of which is planned for 2020.

The MRJ90, the first variant Mitsubishi will deliver, and which most of its customers have signed for, also do not meet current US scope clause agreements. Utah-based SkyWest Inc has signed for 100 MRJ90s with options for an additional 100, while Trans States Holdings has firm orders for 50 MRJ90s, and options for a further 50.

SCOPE CLAUSE

In May, SkyWest chief executive Chip Childs dampened his tone on the MRJ90 as scope clause relief remained elusive at its partners, saying: "Until we can get scope, we're likely not a serious candidate to take that [MRJ90]."

With a maximum take-off weight of 39,600kg, the 88-seater aircraft is just over the limit of 39,010kg for regional jets in US pilot contracts. The scope clause also limits regional jets to 76 seats.

Both carriers can switch to the smaller MRJ70, but prefer the larger jet. MRJ president Morimoto would only say that the switch option is stipulated in the purchase contracts, and that it is not worried about "any sort of cancellations".

Mitsubishi's focus is on the MRJ90, and it will only start flight tests for the MRJ70 after it is done with those for the larger jet. Right now, only parts production for the smaller aircraft has started, with final assembly expected to be completed in 2017. Service entry is planned for one year after the MRJ90.

While the manufacturer sees the need for a full range of product, it has refrained from formally launching the larger MRJ100X. The 100-seater could fill a gap, but Mitsubishi's has a lot on its hands now. The earliest the MRJ100X could enter the market is 2020, a year after the MRJ70, assuming no further delays with the programme.

TAPPING EXPERTS

Morimoto says the airframer's biggest challenge is its lack of expertise and experience. Mitsubishi has hence taken the smart approach of collaborating with experts.

At its Seattle Engineering Centre, which will produce flight test specifications and analyze flight test data, Mitsubishi is working with flight test and certification specialist AeroTec.

Mitsubishi will also conduct flight test and engineering operations in three other states. High altitude tests will happen at Colorado's Gunnison Crested Butte Regional airport, special runway tests at New Mexico's Roswell International Air Centre, and extreme environment tests at Florida's Mckinley Climatic Laboratory.

The manufacturer is also acutely conscious of the need to provide reliable support, especially with its status as a new entrant.

Early on in the MRJ's development, it picked long-time ally Boeing to provide customer support for the jet. The 10-year partnership will deliver round-the-clock support for MRJ operators, covering spare parts provisioning, service operations and field services. This allows Mitsubishi to focus on launching the aircraft, while Boeing lays a foundation for customer support that Mitsubishi can later build on.

It has also signed with MRO firms HAECO Americas, Pemco World Air Services and MRO Japan. These companies' footprint matches those of MRJ customers.

STRONG SHOWING

All the pieces are laid for success, but a key concern at the top of president Morimoto's mind is to get the MRJ certificated. It does not help that the Japan Civil Aviation Bureau is as inexperienced when it comes to the task.

"JCAB also has lack of experience so it may take a while to get certification, more than we expected. But now we're quite cooperative and consult them very much in advance so we can solve issues early. It's still challenging but I think the situation is getting better."

Mitsubishi now has commitment for 427 aircraft: 233 firm orders, 170 options and 24 purchase rights. This is a strong showing for a company that has never produced a commercial aircraft – despite the company's strong aerospace pedigree. To live up to this promising start, however, first it must get the jets to Moses Lake, and get testing started.

Source: <https://www.flightglobal.com/news/articles/analysis-mrj-readies-for-its-ultimate-test-429590/>