

**Aviation Safety Investigation Report
199403561**

**British Aerospace Plc
Jetstream**

29 November 1994

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NOTE: All air safety occurrences reported to the ATSB are categorised and recorded. For a detailed explanation on Category definitions please refer to the ATSB website at www.atsb.gov.au.

Occurrence Number: 199403561 **Occurrence Type:** Incident
Location: 80km SW Sydney
State: NSW **Inv Category:** 3
Date: Tuesday 29 November 1994
Time: 1745 hours **Time Zone** ESuT
Highest Injury Level: None

Aircraft Manufacturer: British Aerospace Plc
Aircraft Model: 4100
Aircraft Registration: VH-IMR **Serial Number:** 41038
Type of Operation: Air Transport Domestic Low Capacity Passenger Scheduled
Damage to Aircraft: Nil
Departure Point: Melbourne VIC
Departure Time: 1618 ESuT
Destination: Williamtown NSW

Crew Details:

Role	Class of Licence	Hours on Type	Hours Total
Pilot-In-Command	ATPL 1st Class	234.0	5912

Approved for Release: Wednesday, June 12, 1996

Factual Information

During cruise at FL250 in instrument meteorological conditions with light to moderate icing, the crew reported that the aircraft yawed to the left and the left engine ran down to about 4% torque then recovered in about 2 seconds. About 1 minute later the same problem occurred to the right engine. The pilot requested a descent to FL180 and disconnected the autopilot to hand fly the aircraft. About 30 seconds later both engines almost simultaneously suffered the same problem again. The crew carried out checks for erratic engine behaviour and requested a descent into Sydney for a precautionary landing. The remainder of the flight was uneventful.

Extensive ground checks revealed that neither engine had sustained damage as a result of the event. Flight Data Recorder information indicated that the first event occurred on the left engine when the torque fell to 26.4% with a loss of 1.8% RPM which recovered in about 4 seconds. One minute 24 seconds later the left engine again suffered a torque loss to 18.6% with a loss of 3% RPM recovering in about 3 seconds. About 30 seconds later the right engine suffered a similar event. Torque dropped to 18.7% with an RPM loss of 3.8% recovering in 3 seconds. These events occurred at FL250 and no further events were recorded. Propeller and engine anti-icing were on at the time and continuous ignition was selected.

Information from the Bureau of Meteorology indicated that the aircraft was in light rain at the time and the water droplets were probably supercooled.

Analyses

Visual inspection of the aircraft revealed that both engines had an into-wind step where the inlet cowl fairings with the spinner (the engine cowl protrudes below the line of the spinner). The step on the left engine was more pronounced than the right. The manufacturer is of the opinion that an into-wind step in this location can result in the formation of ice which can interfere with inlet airflow and subsequently lead to ice ingestion. To rectify this problem the manufacturer has raised modifications and maintenance instructions.

Power recovery under these conditions is dependent on a fully serviceable ignition system. Either auto re-ignition or, if that system is unserviceable, continuous ignition must be selected.

The operator's Minimum Equipment List (MEL) provides for the aircraft to be dispatched with the auto re-ignition system inoperative. The system is then placarded inoperative and a procedure testing the continuous ignition system is carried out. This procedure requires observation of the flight deck lights for the L-IGN and R-IGN to ensure they illuminate. However, this procedure does not guarantee that the respective engine ignitors are operating.

CONCLUSION

Significant Factors

The following factors were considered relevant to the development of the incident.

1. The aircraft encountered an area of supercooled rain.
2. Both engines have into-wind steps at the inlet cowl to spinner fairing which allowed the formation and probable ingestion of ice.
3. Engine power recovery was effected by the ignition system.

SAFETY ACTION

As a result of this investigation it was determined that the integrity of the ignition system is paramount for instantaneous power recovery to the engine.

The Bureau has made the following recommendation R950102:

The Bureau of Air Safety Investigation recommends that the Civil Aviation Safety Authority amend all Jetstream J 4100 Minimum Equipment Lists to include an audible test of the engine ignitors to ensure correct operation prior to dispatch with the auto re-ignition system inoperative.