

**Aviation Safety Investigation Report  
199604078**

**British Aerospace Plc  
BAe 146-300  
British Aerospace Plc  
BAe 146**

**11 December 1996**

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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](http://www.atsb.gov.au).**

The Bureau did not conduct an on scene investigation of this occurrence. The information presented below was obtained from information supplied to the Bureau.

**Occurrence Number:** 199604078                      **Occurrence Type:** Incident  
**Location:** 130km N Brisbane, VOR  
**State:** QLD    **Inv Category:** 4  
**Date:** Wednesday 11 December 1996  
**Time:** 1200 hours                                      **Time Zone** EST  
**Highest Injury Level:** None

**Aircraft Manufacturer:** British Aerospace Plc  
**Aircraft Model:** BAe 146-300  
**Aircraft Registration:** VH-EWM                      **Serial Number:** E3179  
**Type of Operation:** Air Transport High Capacity Passenger  
**Damage to Aircraft:** Nil  
**Departure Point:** Proserpine QLD  
**Departure Time:**  
**Destination:** Brisbane QLD

**Aircraft Manufacturer:** British Aerospace Plc  
**Aircraft Model:** BAe 146-200  
**Aircraft Registration:** VH-NJU                      **Serial Number:** E2073  
**Type of Operation:** Air Transport High Capacity Passenger  
**Damage to Aircraft:** Nil  
**Departure Point:** Mackay QLD  
**Departure Time:**  
**Destination:** Brisbane QLD

**Approved for Release:** Thursday, June 5, 1997

## FACTUAL INFORMATION

Two BA146s were inbound to Brisbane from the north. Both aircraft were being processed for landing on runway 01. There were thunderstorms in the area north of Brisbane and the crew of the leading BA146 requested approval to divert east and west of the aircraft's cleared track to avoid weather. These diversions were approved by the sector controller, who advised the crew to divert a specific number of miles left or right of track.

A new air route structure had been implemented the previous week and this had introduced significant changes to the handling of traffic. Controllers were consolidating their understanding of the routes and the processing of traffic. The sector controller was suitably rated and traffic numbers were low. Traffic complexity had increased as a result of the route changes and the weather. In previous years, prior to the start of the summer storm activity, the Airservices' Northern District office had issued a temporary local instruction reminding controllers of the impact of aircraft diversions on safety and co-ordination. The local instruction had not been issued for the current season.

The diversions caused the lead BA146 to eventually be displaced approximately 9 NM east of, and parallel to, the second BA146. To maintain separation between the two BA146s, the Flow controller co-ordinated with the sector controller for the eastern BA146 to track via Maleny for an approach to runway 14. The amended track and runway was issued to the crew of that aircraft. The crew advised the controller that further diversions would be required.

The crews of both BA146s were assigned descent and were being separated using radar. The crew of the eastern BA146 transmitted to the sector controller that they were diverting 10 NM right of track due to weather. The sector controller acknowledged the transmission with "Roger". This was approved terminology but the Manual of Air Traffic Services stated that it should not be used in reply to a question requiring a direct answer in the affirmative or negative. The crew of an aircraft requiring diversion from a cleared route, in controlled airspace, are to obtain air traffic control approval prior to changing track. The crew of the BA146 did not request approval for the diversion. The sector controller did not reply to the crew that the change in the aircraft's tracking was approved or disapproved.

The crew of the BA146 assumed the diversion was approved. They tracked the aircraft to the west towards the other BA146. The sector controller became concerned at the diminishing horizontal separation, between the two aircraft, and instructed the western BA146 to turn right onto a heading of 180 degrees due to traffic to the east. The controller instructed the crew of the diverting BA146 to turn right onto a heading of 270 degrees to enable the aircraft to pass behind the other BA146. The controller issued instructions to the crews of both aircraft in an attempt to establish vertical separation of 1,000 ft before horizontal separation reduced to less than the required standard of 5 NM. The sector controller did not issue traffic information to the crews of either aircraft when the horizontal and vertical separation standards were infringed. The Manual of Air Traffic Services states that when a separation standard does not exist, a controller shall issue traffic information to the aircraft concerned when, in his opinion, their proximity warrants it.

Analysis of the radar data showed that the horizontal separation had reduced to 4 NM when the vertical separation was 700 ft. There was a breakdown of separation.


## ANALYSIS

Previous approvals by the sector controller for the crew to divert around weather were quite specific. On the last occasion the sector controller acknowledged the transmission but did not provide a positive instruction to the crew. The terminology used by the controller was ambiguous. The crew of the diverting BA146 assumed that the acknowledgement by the sector controller was an approval to divert off track. The crew were distracted by the need to avoid the weather and did not query the controller before diverting off track.

The sector controller did not use suitable separation assurance techniques to ensure that separation was maintained between the aircraft. The use of these techniques was essential for aircraft that were diverting around weather, due to the potential for random tracking and an increase in cockpit workload.

The non-issue of the local instruction may have removed a prompt to the sector controller of the need to apply separation assurance techniques.

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The controller was aware that the separation between the two BA146s was reducing and endeavoured to rectify the situation. The provision of traffic information may have enabled one of the crews to sight the other BA146 and to assist in maintaining separation.

#### SIGNIFICANT FACTORS

1. The Northern district office did not issue the temporary local instruction regarding traffic management aspects during inclement weather.
2. The sector controller did not use appropriate separation assurance techniques.
3. The crew of the BA146 assumed that their intended diversion off track was approved.
4. The sector controller did not issue traffic information to either crew when the vertical and horizontal separation reduced to below the standard.

#### SAFETY ACTION

##### Local safety action

Airservices Australia Northern District Office management has noted that controllers need to be aware of the impact of diversions and will re-issue the temporary local instruction each October.

