

**Aviation Safety Investigation Report
199200081**

**Beech Aircraft Corp
Baron
Cessna Aircraft Company
402B**

01 July 1992

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Occurrence Number: 199200081 **Occurrence Type:** Incident
Location: Mendooran
State: NSW **Inv Category:** 3
Date: Wednesday 01 July 1992
Time: 0855 hours **Time Zone** EST
Highest Injury Level: None

Aircraft Manufacturer: Beech Aircraft Corp
Aircraft Model: 58
Aircraft Registration: VH-ABP **Serial Number:** TH709
Type of Operation: Non-commercial Pleasure/Travel
Damage to Aircraft: Nil
Departure Point:
Departure Time:
Destination:

Aircraft Manufacturer: Cessna Aircraft Company
Aircraft Model: 402B
Aircraft Registration: VH-FCL **Serial Number:**
Type of Operation: Charter Passenger
Damage to Aircraft: Nil
Departure Point:
Departure Time:
Destination:

Approved for Release: Monday, November 20, 1995

1. FACTUAL INFORMATION

At the time of the incident, both aircraft were operating in visual meteorological conditions under instrument flight rules (IFR) and proceeding on tracks that crossed near Mendooran. Both aircraft were operating at a correct hemispherical level of 9,000 ft in non-controlled airspace managed by the Sydney flight service centre (FSC). The Beech B58 pilot had not reported maintaining his cruising altitude. Prior to the occurrence each pilot had been unaware of the presence of the other aircraft. The pilot of the Cessna C402 sighted the Beech B58 just prior to the crossing of their respective flight paths. The Cessna pilot estimated that there was approximately 500 m horizontal separation as he passed behind the Beech B58. The required traffic information service had not been provided by the responsible flight information sector (FIS), which was FIS 1.

The Sydney FSC is managed by a senior area manager who has two teams, northern and southern, working the various domestic FIS sectors, identified as FIS 1 to 6, and the international sectors, identified as FIS INT 1 and 2. Each team has a team leader responsible for the operation of their respective teams during the shift.

All face-to-face pilot briefing facilities were terminated at midnight on the previous evening, 30 June 1992. Briefings were then required to be obtained via manual or automated systems consolidated to Brisbane or Melbourne regional briefing offices (RBOs). Aircrew could obtain operational information and submit flight plans through the relevant RBO.

One important element of the consolidated RBO program, the automated meteorological and Notice to Airmen (NOTAM) facsimile briefing (AVFAX) system, operates only from Brisbane and provides the service for the whole of Australia. On the morning of the incident, two unforeseen technical problems arose that resulted in a disruption to the system. Firstly, a software problem in the AVFAX system resulted in it not being able to cope with the extra demand on its services. Its failure left many pilots without the required pre-flight briefing information. These pilots then resorted to the only apparent avenue left to them, they telephoned the RBOs.

Secondly, contracts had been negotiated to provide an Australia-wide 008 telephone switching network. The switching was intended to divide expected calls between the two RBOs in a predetermined manner. However, the switching network was not completed until approximately midday on the day of the incident. This resulted in the Brisbane RBO having to accept more calls than the system had been designed to accept.

Subsequently, many pilots used the FIS flightwatch service to obtain briefing material that they would normally have obtained via the automated briefing systems. This placed an abnormal demand on the flightwatch service and directly contributed to increased workload for FIS operators.

The published frequency for the FIS flightwatch service in Sydney terminates at the FIS 2 workstation, adjacent to FIS 1. Both operators have shared access to a terminal of the flight information service on request (FISOR) computer system. FISOR is reported to be slow to respond to operator's commands and only one FIS operator can access information at one time. This leads to delays in providing the information to FIS operators and pilots. This incident occurred during such an occasion.

Prior to and at the time of the incident, the northern team leader was actively assisting the FIS 2 operator to process the exceptionally high level of demand on flightwatch. All other sectors were staffed in the normal manner. One FIS-rated officer was having a short break in the adjoining amenities room.

The FIS 1 officer was also under a heavier than normal air traffic workload. This was caused by a combination of factors including numerous aircraft using the FIS 1 frequency for the flightwatch service to obtain and update operational information such as meteorological forecasts and NOTAMs. One particular aircraft had made repeated requests for weather information whilst en route to Lord Howe and Norfolk Islands. The required information was not readily available to the FIS 1 operator and required special handling at a time when FIS 1's traffic and workload were increasing.

Previous pilot complaints had been received regarding slow responses to FIS flightwatch requests. Sydney FSC management had therefore issued a staff memo urging FIS operators to respond to flightwatch requests in a more timely manner. Consequently, on the morning of this incident, the workload was very high and supervisors were fully occupied assisting all FIS sectors to cope with the operational demands.

The FIS officer concerned was performing only his second shift on the newly consolidated sector and his responsibilities involved airspace with which he was not totally familiar. In addition, he was using communication facilities with unfamiliar coverages and code groups for flight progress strip (FPS) notations. The map to which he needed to frequently refer was cluttered and locations were not easily readable. Because of this he was unable to find the actual geographic locations of many of the position reporting waypoints in the limited scan time available.

Additionally, the Sydney FSC had previously moved from the conventional single stacked FPS display to a new multiple stack, geographic, FPS display.

Standard operating procedures for the geographic FPS display required that the FIS operator check for traffic conflicts before moving any FPSs into a new bay. However, the geographic display was considerably more demanding than the former single-stack display. The stack display presented all active FPSs under one bay designator while the geographic display presented numerous bays of FPSs. The geographic display was laid out with the required bay designators so as to provide a representation of the sectors airspace, with the top of the display representing north and the left-hand side representing west.

The geographic display, while basically sound, requires the FIS operator to visually scan a larger display area than the stacked display. Additional FIS operator estimates for en-route abeam positions, associated FPS entries, as well as inter- and intra-FPS bay movements, were also required. Not all of the operational information which determines the FPS placements within the FPS bays is notated in the same prominent positions on the FPS.

The FIS 1 operator indicated that the FPS notations also served as a memory jogger to assess traffic conflicts, frequency transfers and next actions due. In this incident, the FIS 1 operator should have estimated an abeam Dubbo time for notation of the Cessna C402s FPS. That FPS should then have been placed into the same bay as the Beech B58 i.e. Mendooran. The FIS 1 operator believed that, as he had not calculated and notated the abeam Dubbo information on the Cessna C402 FPS, he must have moved that FPS across two bays and placed it directly into the bay above Mendooran. He had also overlooked the calculation, FPS notation and execution of a frequency transfer for the Cessna C402. These actions may have prompted him to believe that the Cessna C402 FPS was in fact in the wrong bay.

A further prompt that the aircraft were operating at the same altitudes could have been provided had the pilot of the Beech B58 reported maintaining 9,000 ft. This would have occurred prior to the Mendooran waypoint and required the FIS 1 operator to notate that FPS. The FIS 1 operator would probably have then rescanned the geographic display and perhaps detected that the Cessna C402 and Beech B58 were in conflict.

On 25 June 1992, a few days prior to this incident, Sydney FSC had completed a stage of consolidation and resectorisation which incorporated the Dubbo airspace responsibilities into the FIS 1 sector. Additional radio-communication facilities and frequency coverage were terminated at FIS 1.

The FIS 1 operator stated that this was his second shift on the consolidated FIS 1 sector and that he was not totally familiar with the site-specific communications coverage or geography for the new airspace. He also reported that he had found the workstations overhead map display did not readily assist in locating aircraft flight-planned tracks and waypoints during high workload situations.

Prior to Sydney FSC absorbing the Dubbo airspace, training staff from Sydney were sent to Dubbo flight service unit (FSU) to become familiar with the operation of that airspace and construct a training package. However, the training package failed to indicate to FIS operators those locations and/or routes where Dubbo FIS officers had found recurring potential conflicts.

2. ANALYSIS

This occurrence stemmed from a series of events under high workload conditions where the FIS 1 officer commenced load shedding by truncating standard operating procedures. This overload environment led to his failure to detect a basic traffic conflict between two IFR aircraft.

The closing of face-to-face briefing facilities meant that many pilots had not used the new remote briefing facilities for the first time on the morning of 1 July 1992. They then overloaded the RBO facilities either by not fully understanding the method of use or by not organising the extent of information required i.e. they asked the system facilities to provide them with more information than they may have actually needed.

The failure of the automated briefing systems left pilots waiting to depart without sufficient operational information. Many of them departed without briefing and used the FIS flightwatch service to obtain their requirements when airborne.

Flightwatch is primarily designed to provide updates to briefings already received. It was not intended to provide the volume of information that was being requested on the morning of 1 July 1992. Consequently, the Sydney FIS operators were very busy with non-routine requests.

The high workload and diverse spread of next action due information on the relevant FPSs, combined with an unfamiliar geographic display, actively contributed to the loss of situation awareness and the failure to detect the traffic conflict.

The situation was probably further exacerbated by this officer's long experience (approximately 19 years) with the single-stack display system before conversion to the new multi-stack geographic display. He had used the multi-stack geographic display for a few months previously, but only for Sydney FIS airspace with which he was more familiar.

On the day of the incident, he was using the geographic display in a totally new airspace environment. He had received approximately 8 hours of simulator training for the consolidated FIS 1 sector. While this may have been appropriate for normal traffic levels and demands, the simulator training could not possibly have anticipated the exposure to the high workload situation encountered on the morning of the incident.

The effects of the FPS geographic display, high workload, cluttered overhead map displays and the responsibility for additional airspace, had to be assimilated by the officer in a short time. This resulted in not being able to maintain the level of traffic and situation awareness needed to perform all the functions required at that time.

Unfamiliarity with the peculiarities of the Dubbo airspace and geography and the new FPS display presentation in such high workload situations, probably contributed to the operator reverting to a previously learnt behaviour and procedures applicable to a stack display. As a result of attempting to 'keep the picture', the relevant FPSs for the Cessna C402 were placed into the incorrect FPS bay without appropriate notations and recognition of the crossing of aircraft flight paths.

3. CONCLUSIONS

3.1 Findings

1. Numerous aircraft operators were not conversant with the remote briefing arrangements following the closure of face-to-face briefing facilities.
2. AVFAX failed to handle the increased demand for services imposed on the first operational day following the cessation of face-to-face briefing facilities.
3. The national 008 phone number automatic switching program had not been completed.
4. Many pilots departed without being able to obtain adequate briefing information.
5. Many pilots used the FIS flightwatch service for in-flight briefings because they had been unable to obtain them from the RBOs.
6. The interrogation and response processes of the FISOR terminal was slow.
7. The FISOR terminal was shared by two FIS sectors.
8. Management had issued a memo urging FIS officers to expedite processing of pilot requests for FIS flightwatch service.
9. The Beech B58 pilot did not report reaching his cruising level.
10. The FIS 1 operator experienced a substantial increase in workload.

11. A new FPS geographic display system was in use.
12. The FIS 1 operator was not totally familiar with working the former Dubbo FIS airspace.
13. The FIS 1 workstation overhead map display was cluttered and unsuitable for use under the circumstances current at the time of the incident.
14. The transfer of local operational knowledge from Dubbo FSU to Sydney FSC did not incorporate known areas of potential traffic conflict or potential frequent confliction.
15. The FIS 1 operator omitted some documented FPS procedures and practices which removed a number of safety net indicators.

3.2 Significant Factors

1. The FIS flightwatch service was used as a briefing service when AVFAX was unable to handle the load placed upon it.
2. The FIS 1 operator was exposed to a substantial increase in workload at a time when his experience with the geographic display and his knowledge of the airspace were insufficient to manage that increase.
3. Some operationally pertinent flight progress strip notations were omitted while others were recorded in less conspicuous and non-sequential areas of the relevant flight progress strips.
4. The training program for FIS 1 operators did not adequately address known points of frequent confliction.

SAFETY ACTIONS

4.1 As a result of this investigation, the following safety actions were suggested to the local management of the Civil Aviation Authority at the Sydney Flight Service Centre:

- i) whilst being conscious of the industry perceptions of service, remind its local flight service officers of the necessity to give priority to traffic conflicts first and FIS flightwatch second;
- ii) provide a standardised and simplified overhead map display at the FIS 1 workstation. The overhead map display should be similar to that provided at the other operational workstations and simulator;
- iii) amend the local operating instructions for FIS 1 to include the peculiarities of the Dubbo airspace, geography and known traffic confliction locations; and

iv) amend the manual of Air Traffic Services to ensure that FIS operators estimates of abeam positions and frequency change requirements are recorded in a more prominent and sequential area of the flight progress strip where FIS geographic display systems are in use.