Aviation Safety Investigation Report 199601487

Fairchild Industries Inc Metro 23

09 May 1996

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Aviation Safety Investigation Report

199601487

Occurrence Number: 199601487 **Occurrence Type:** Incident
Location: Perth, Aerodrome
State: WA **Inv Category:** 3
Date: Thursday 09 May 1996
Time: 1220 hours **Time Zone** WST
Highest Injury Level: None

Aircraft Manufacturer: Fairchild Industries Inc
Aircraft Model: SA227-DC
Aircraft Registration: VH-WAJ **Serial Number:** DC-876B
Type of Operation: Instructional Unknown
Damage to Aircraft: Nil
Departure Point: Perth
Departure Time: 1040 WST
Destination: Perth

Approved for Release: Thursday, March 27, 1997

FACTUAL INFORMATION

A Fairchild Metroliner was one of a number of aircraft conducting training in the Perth terminal area. Three air traffic control (ATC) positions were operating in the tower: surface movement, coordination, and aerodrome control. The aerodrome controller was also conducting "on the job training" (OJT) of a trainee controller. The aerodrome controller conducting the training was suitably rated and had completed an OJT instructor course. Runways 21 and 24 were in use for arrivals and departures. Practice instrument approaches were also being conducted by a number of aircraft. The wind was gusty and there were intermittent showers in the area, with a cloud base of approximately 2,500 ft and a visibility in excess of 10 km.

Previously within Perth ATC centre, the approach coordination controller had passed aircraft estimates with the assigned runway to the tower coordinator. In an endeavour to reduce voice coordination between tower and approach elements, a procedure utilising the radar display label was in use. This procedure entailed the approach controller including the assigned runway for arriving aircraft on the "Ops Data" line of the radar display label. Thus, any controller with access to a radar display could read the runway assigned to arriving aircraft. As part of the procedure, the approach coordination controller ceased to provide updated estimated time of arrivals (ETAs) to the tower coordinator. Aerodrome controllers calculated an ETA from the observed position of aircraft on the radar display and updated tower flight progress strips accordingly. This meant the aerodrome controller had to observe the radar display label for each arriving aircraft to obtain the assigned runway and to calculate an ETA. As a consequence, aerodrome controllers generally changed range scales between the 17 NM and 50 NM scales on a regular basis. The procedure was noted as being easily undertaken in low density air traffic situations. However, when traffic conditions were busy, an aerodrome controller's ability to change range scales, calculate an ETA and note the assigned runway was conditional; being subject to the complexity of aircraft operations at the time and the level of experience of individual controllers. The trainee controller had very little expertise in the procedure and was developing his skills while undertaking OJT in aerodrome control.

The aerodrome control position at the console was designed for single-person operation and there was insufficient space for the trainee and the aerodrome controller to occupy the position at the same time. Thus, while the trainee was undertaking OJT he was required to operate and monitor all aerodrome controller facilities on the console. The aerodrome controller's ability to read the tower radar display labels was limited by the physical location of the display and other facilities on the console. This situation was compounded by the use of a glare shield around the radar display, which was used to reduce the effect of extraneous light on the display. Without the shield, sunlight washed the display presentation and made it difficult for controllers to see aircraft symbols and labels. However, when the shield was in use, a controller could not observe the display without standing adjacent to the console and looking directly over the shield onto the radar display. Consequently, the aerodrome controller had to regularly re-position himself to be able to read the radar display while the trainee controller was operating in the aerodrome control position. The aerodrome controller was unable to readily review information on the flight progress strips or on the radar display.

As the traffic sequence developed and became more complex, the aerodrome controller assumed control responsibility from the trainee. The trainee stepped back from the console to enable the aerodrome controller to operate facilities, view the flight strips and monitor the radar display.

The correct reading of the label or re-checking of the label information was critical to the aerodrome controller's task as the information was not provided from any other source. However, the trainee controller had not been advised of the potential problems and was endeavouring to learn the procedure while training in the aerodrome control position.

After taking over from the trainee the aerodrome controller did not confirm the runway assignment for any aircraft. He only used the information available to him from the flight progress strips on the console. Runway 24 was annotated on the flight strip for a Boeing 737 inbound from the east of Perth. As he subsequently became engrossed in sequencing and separating aircraft, he did not notice that the assigned runway for the Boeing 737, on the radar display label, was actually runway 21.

The crew of the Metroliner had been cleared to operate in the circuit not above 1,500 ft. After completing a number of circuits, the crew were instructed to make a left circuit for runway 21 and to report sighting a Baron aircraft joining an abbreviated instrument landing system final approach at 5 NM. The crew of the Metroliner did not sight the Baron and were instructed to continue downwind, which took them closer to the boundary between Perth and RAAF Base Pearce control zones (CTR). At about the same time, the supervising controller coordinated unrestricted descent for the Boeing 737 arriving from the east for landing on, what he thought, was runway 24.

Due to the proximity of the Metroliner to the boundary between Perth and Pearce CTRs to the north of Perth aerodrome, the approach controller queried the aerodrome controller's intentions for the Metroliner. The aerodrome controller intended to instruct the crew of the Metroliner to make a left orbit on base to sequence the aircraft with the Boeing 737, which he believed was to land on runway 24. The aerodrome controller then observed the radar display symbol for the Boeing 737 approaching left base for runway 21 and susequently requested confirmation of the assigned runway from the approach controller. The approach controller confirmed the Boeing 737 was assigned runway 21.

The crew of the Metroliner were aware the aircraft was well north of Perth and close to the airspace boundary, but they expected to turn and return to Perth very shortly and were thus unconcerned. The crew of the Boeing 737 reported sighting the Metroliner and were instructed by the approach controller to maintain 2,500 ft. The aerodrome controller instructed the crew of the Metroliner to orbit right to enable the Boeing 737 to continue descent for landing. Once radar separation was established, the crew of the Boeing 737 were instructed to make a visual approach.

As the crew of the Metroliner orbited to the right, the aircraft entered the Pearce CTR and conflicted with a Macchi aircraft. The pilot of the Macchi was conducting a tactical air navigation (TACAN) approach to runway 36 at Pearce and the last reported level was 2,000 ft. The Macchi and the Metroliner were observed by Pearce air traffic control radar to pass with approximately 1.5 NM horizontal separation. Neither crew observed the other aircraft. The crew of the Metroliner and the Macchi continued their flights and landed at Perth and Pearce respectively. There was a breakdown of separation.

ANALYSIS

Procedures

The procedure for notifying assigned runway and calculating estimates for arriving aircraft for the tower had proven to be an effective alternative to the previous voice coordination. However, controllers needed to ensure that the label information was correctly transposed to the flight progress strips and that the radar display scale was changed regularly to check for arriving aircraft. This entailed a degree of skill which had to be developed with experience. The difficulties in using the radar display and the need to occasionally re-check aircraft label information was appreciated by other rated and more experienced controllers. However, this aspect had not been brought to the attention of the trainee controller prior to undergoing OJT. Consequently, he was unprepared for the switching of range scales on the display and the need to confirm the "Ops data" information, on an opportunity basis, to ensure the integrity of the operational information transposed to the flight progress strips.

It is possible that the trainee annotated the incorrect runway on the flight progress strip for the Boeing 737 prior to the aerodrome controller taking over the position. Additionally, because of the difficulties in observing the radar display while the trainee was operating at the position, it is likely that the aerodrome controller was unable to readily confirm the runway assignment of individual aircraft as the trainee annotated the respective flight progress strips. The procedure relied solely on controller skill; should the controller not perform the procedure correctly there was no back-up to ensure the tower received the necessary information.

Training

The trainee had not received any preparatory brief or training prior to the conduct of aerodrome control OJT. The trainee was rated at surface movement control but he had been absent from Perth aerodrome for a number of months working as a relief controller at Jandakot aerodrome. The lack of preparatory training was in contrast to terminal area trainees who receive 1 week of classroom training and 2 weeks of simulator training prior to undertaking OJT. The lack of preparatory training meant the trainee had to learn most aspects of the task while actually operating in the control position. This made the training difficult because of the different learning skills involved.

The different learning aspects coupled with his unfamiliarity with operations meant that the trainee was unlikely to be able to perform at the optimum level for OJT. Better preparation of the trainee prior to commencing the OJT would have been a defence against the incident occuring.

Airspace

Due to the proximity of RAAF Pearce to Perth, similar runway alignment and the location of the CTR boundary midway between the two aerodromes, operations in both CTRs can be constrained at times. This makes management of the airspace difficult and can limit the options available to controllers. It also requires a high level of situation awareness by controllers to ensure aircraft are not instructed or cleared in a manner that would have them infringe the Pearce CTR. In this incident the aerodrome controller was aware of the proximity of the Metroliner to the CTR boundary but was limited in his options to ensure descent was available for the Boeing 737. To achieve this he needed the crew of the Metroliner to orbit right. The subsequent instruction caused the Metroliner to enter the Pearce CTR.

The crew of the Metroliner were aware that the aircraft was close to the CTR boundary but they believed the controller would have obtained clearance from Pearce ATC for the aircraft to enter the CTR. Consequently, the crew complied with the controller's instruction. The aircraft entered the adjacent CTR without a clearance and conflicted with the Macchi aircraft.

SIGNIFICANT FACTORS

1. The trainee controller was inadequately prepared to undertake OJT.

2. The aerodrome controller had difficulties in observing the radar display while the trainee was operating the control position.

3. The aerodrome controller, after taking over control from the trainee, had insufficient time to confirm the runway assignment of arriving aircraft.

4. The proximity of Perth and Pearce aerodromes and the common CTR boundary limited the options available to the aerodrome controller.

SAFETY ACTION

1. Perth ATS management implemented a traffic management plan in December 1996 which should assist controller traffic management.

2. The Bureau of Air Safety Investigation is evaluating aspects of "on the job training" relating to Perth Tower. Any forthcoming recommendations will be published in the Quarterly Safety Deficiency Report.