

Department of Transport and Regional Development

Bureau of Air Safety Investigation

An Analysis of Incidents Involving Aircrew Failing to Comply with Air Traffic Clearances June to August 1996



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ABBREVIATIONS AND DEFINITIONS

| | |
|-------|--|
| ATC | Air Traffic Control |
| ATS | Air Traffic Services |
| BASI | Bureau of Air Safety Investigation |
| CASA | Civil Aviation Safety Authority |
| ESIR | Electronic Safety Incident Report |
| FTC | Failure to Comply An air safety incident in which flight crew fail to follow an air traffic clearance in controlled airspace. |
| HCRPT | High-Capacity Regular Public Transport aircraft An aircraft that is certified as having a maximum seating capacity exceeding 38 seats or a maximum payload exceeding 4,200 kg. |
| ICAO | International Civil Aviation Organisation |
| LCRPT | Low Capacity Regular Public Transport aircraft An aircraft that is certified as having a maximum seating capacity not exceeding 38 seats or a maximum payload not exceeding 4,200 kg. |
| LNAV | Lateral Navigation |
| NM | Nautical Mile |
| MTOW | Maximum Take-Off Weight |
| SID | Standard Instrument Departure |
| SRD | Standard Radar Departure |
| STAR | Standard Arrival Route |
| VOR | VHF Omni Range |

EXECUTIVE SUMMARY

A Failure to Comply incident is defined as an air safety incident in which flight crew fail to follow an ATS clearance in controlled airspace.

During 1994 BASI recorded an increase in the frequency of incidents involving failures to comply with ATS clearances. This trend continued in 1995 and the largest increase appeared to be associated with the introduction of new arrival and departure procedures at Sydney airport. The Bureau conducted a preliminary study to confirm these trends and concluded that a comprehensive study was necessary.

This report draws on data collected during the comprehensive study of incidents in June, July and August of 1996. The primary data for this study was received through ESIRs and questionnaires completed by the pilots of aircraft involved in FTC incidents.

The data collected showed that 35% of all incidents involved HCRPT aircraft. Private aircraft recorded the next highest proportion of 29%. The incidents involving high capacity aircraft are the focus of this report.

The results of the study confirm the preliminary findings that operations at Sydney airport have the highest level of FTC incidents amongst Australia's major airports. Arrival and departure procedures contributed the majority of incidents in Sydney, continuing the trends identified in the preliminary report.

The underlying factors in FTC incidents are:

- communication (of particular concern with foreign flight crews);
- ATC procedures;
- SID and STAR design; and
- aircraft operating procedures.

1. BACKGROUND

1.1 Bureau of Air Safety Investigation trend monitoring

The Bureau of Air Safety Investigation maintains a computer database of reported incidents and accidents which enables the Bureau to monitor trends. This study was initiated in response to an upward trend in FTC incidents which began in 1994 and continued throughout 1995. A preliminary study was conducted in order to examine the pattern of FTC incidents in Australia and to provide background information in advance of the more detailed BASI study described later in this report.

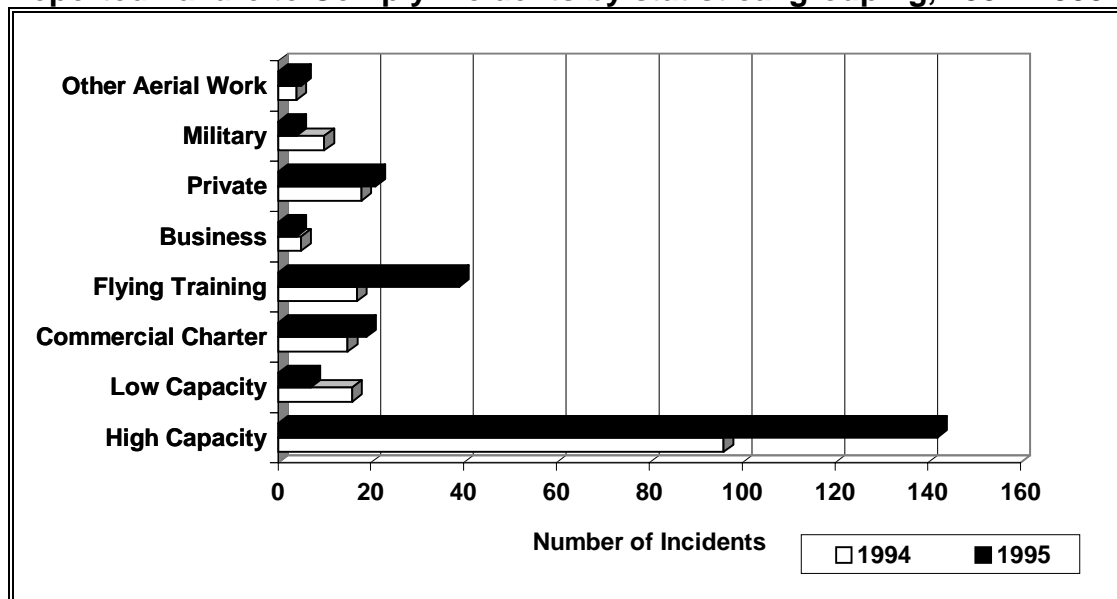
1.2 Definition of Failure to Comply

A Failure to Comply (FTC) incident is defined as an air safety incident in which flight crew fail to follow an ATS clearance in controlled airspace.

1.3 Type of operation

Figure 1 indicates that the majority of FTC incidents in the 2-year period involved HCRPT aircraft. FTC incidents during flying training increased in the same period although the total number in this type of operation remains relatively small.

FIGURE 1
Reported Failure to Comply incidents by statistical grouping, 1994–1995



1.4 Failure to Comply incidents by location

During 1994 and 1995, Sydney ATS reported the largest number of FTC incidents (65%) involving aircraft over 5,700 kg MTOW. Melbourne, Perth, Cairns and Brisbane had the next highest numbers of occurrences. Table 1 compares the frequency of FTC incidents between Sydney and other cities.

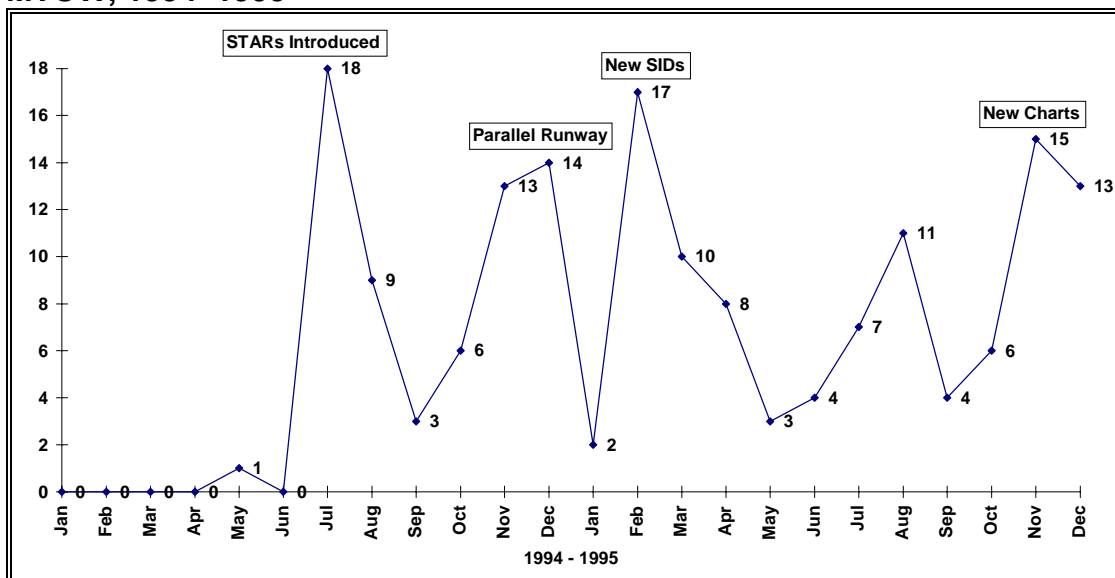
TABLE 1
Frequency of Failure to Comply incidents involving aircraft > 5,700 kg MTOW (1994 and 1995) by location

| Location | 1994 | 1995 |
|-----------|------|------|
| Sydney | 63 | 97 |
| Perth | 8 | 9 |
| Melbourne | 4 | 15 |
| Cairns | 8 | 6 |
| Brisbane | 7 | 4 |
| Other | 11 | 16 |

1.5 Failure to Comply incident trend at Sydney

Figure 2 presents the number of FTC incidents at Sydney, involving aircraft over 5,700 kg, by month for 1994 and 1995. There were significant increases in July 1994, December 1994, February 1995, and November 1995.

FIGURE 2
Failure to Comply incidents at Sydney involving aircraft > 5,700 kg MTOW, 1994–1995



These increases in incidents coincided with the major changes in procedures outlined below:

- June 1994 The former Civil Aviation Authority introduced STARs to Australia. STARs were introduced at Sydney and Melbourne followed by progressive implementation at other major ATS locations.
- Nov. 1994 Opening of parallel runway (16L/34R) at Sydney airport.
- Feb. 1995 New SIDs introduced at Sydney airport.
- Nov. 1995 New charts were issued regarding ATS procedures including STARs and SIDs.

1.6 Conclusion

The analysis of incidents for the 2-year period 1994 to 1995 indicates that FTC incidents increased in frequency from July 1994. The largest number of incidents were associated with Sydney operations and involved high-capacity civil aircraft, although FTC incidents were also reported in Melbourne, Perth, Cairns and Brisbane.

The findings of this preliminary work indicated a need for a further in-depth study and analysis of FTC incidents. The following section presents the findings of that study.

2. METHODOLOGY

All FTC incidents in the period June to August 1996 were examined. Basic descriptive data were obtained from the ESIRs submitted to BASI by Airservices Australia. A specifically designed survey form was then sent to pilots of regular public transport and charter operations, and pilots from the business/private and training operations, involved in selected FTC incidents. This provided more detailed information on the circumstances of the incident. Where necessary, automatic voice logging recorder tapes were replayed and analysed.

2.1 Scope

Basic descriptive data was gathered on FTC incidents which occurred within Australian airspace during June, July and August 1996.

This report presents information gained through the ESIR system and subsequent detailed incident reports.

This report includes information relating to operations involving fare paying passengers (Regular Public Transport and Charter), business flying, flying training and private flying.

3. OBJECTIVES

The objectives of this study were to:

- (a) identify trends of FTC incidents in Australia;
- (b) analyse FTC incidents to identify common factors;
- (c) identify potential solutions to the FTC problem; and
- (d) make recommendations as appropriate.

4. FINDINGS AND DISCUSSION

During the period June to August 1996, the Bureau received 120 ESIRs of FTC incidents. Forty-eight survey forms were sent to pilots in this period and 40 survey forms were completed and returned. This represents an 83% response rate.

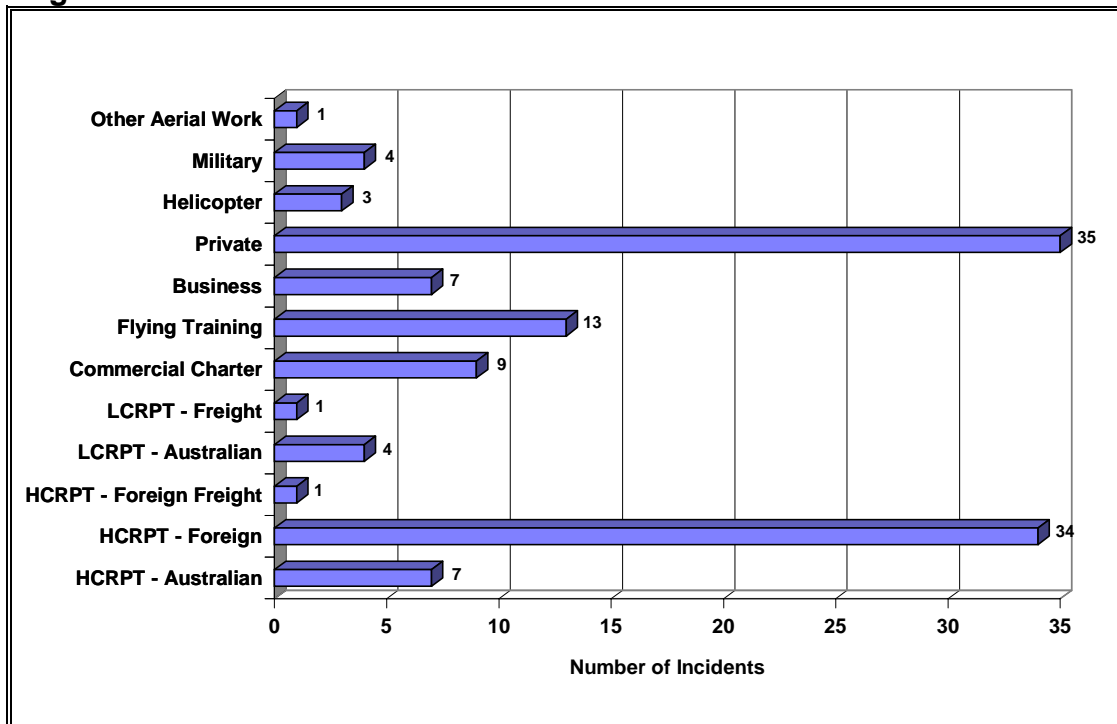
The following information relates to the information received through the ESIRs in June, July and August 1996.

4.1 Type of operation

Figure 3 indicates that HCRPT aircraft were involved in 42 FTC incidents in the period June to August 1996, more than any other statistical group. HCRPT aircraft accounted for 35% of all FTC incidents, of which foreign high-capacity operators represented 87%.

Private aircraft contributed 29% of the recorded FTC incidents and flying training incidents continued to occur in significant numbers.

FIGURE 3
Reported Failure to Comply incidents by statistical grouping, June–August 1996



4.2 Failure to Comply incidents by location

Figure 4 shows FTC incidents for all aircraft and illustrates that the pattern shown in table 1 is continuing, with Sydney ATS reporting the largest number of FTC incidents for the 3-month period.

FIGURE 4
Reported Failure to Comply incidents by airport, June–August 1996

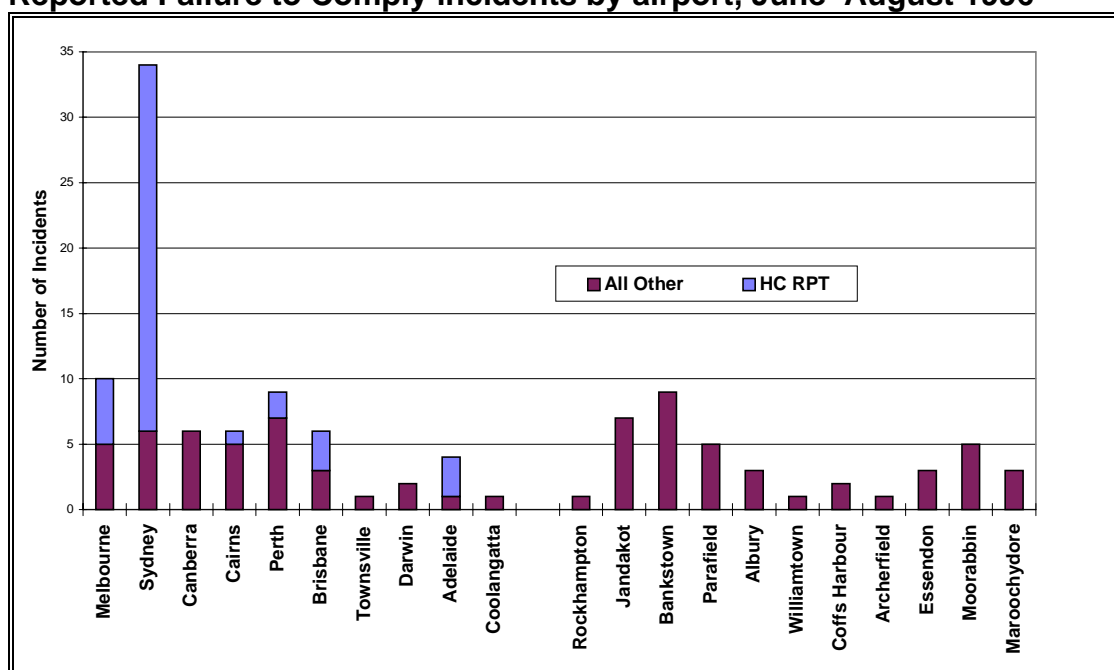


Figure 4 shows the major airports at which incidents associated with high-capacity aircraft are occurring. Sixty-seven per cent of all the reported HCRPT incidents in the 3-month period occurred at Sydney (28 FTC incidents), with the next highest, 12%, occurring at Melbourne.

4.3 Frequency of Failure to Comply Incidents

Table 2 shows the frequency of FTC incidents in relation to total aircraft movements at major Australian airports. As can be seen, Sydney not only recorded the greatest number of these incidents, but also experienced the highest rate of such incidents per 10,000 aircraft movements.

TABLE 2

Frequency of Failure to Comply incidents, June–August 1996

| Airport | Incidents ¹ | Total movements ² | FTC / 10,000 movements ³ |
|--------------|------------------------|------------------------------|-------------------------------------|
| Sydney | 34 | 94,266 | 3.61 |
| Perth | 9 | 26,543 | 3.39 |
| Cairns | 6 | 30,839 | 1.95 |
| Melbourne | 10 | 58,508 | 1.71 |
| Adelaide | 4 | 33,082 | 1.21 |
| Brisbane | 6 | 54,656 | 1.10 |
| TOTAL | 69 | 297,894 | 2.32 |

1. Incidents = all reported FTC incidents, including both high capacity and other aircraft.
2. Total movements = total arrivals + total departures for June, July and August 1996.
3. This figure shows the number of FTC incidents reported for every 10,000 movements at each of the listed airports.

4.4 STAR and SID design within Australia

The development of STAR and SID procedures was reviewed.

STARs were introduced to Australia in June 1994. STARs and SIDs within Australia are designed in accordance with the ICAO obstacle clearance standards by CASA in conjunction with Airservices Australia. No other set of consistent standards is applied and as a result, certain inconsistencies exist in STAR and SID design within Australia.

- Some current ATC procedures relating to STARs do not follow accepted worldwide practice. Generally, worldwide practice is to issue a STAR that leads the aircraft to a position from which an instrument approach can be made. However, in Australia this is not always the case. STARs at Melbourne generally position the aircraft to join an instrument approach, whereas Sydney, Brisbane and Perth STARs culminate with the expectation of radar vectoring to join the final approach course. Furthermore, in Australia STARs may be cancelled and then resumed, which is not accepted international practice.
- It would appear that for traffic flow management, ATC employs the practice of vectoring an aircraft off a STAR, followed by an instruction to resume the STAR. This appears to limit the effectiveness of the STAR procedure.
- Compared with accepted worldwide practice, many Australian STAR procedures include a lengthy 'transition' leg. Confusion exists amongst some air traffic controllers as to whether the transition forms part of the STAR, and therefore which ATC rules apply to the processing of aircraft during this phase of flight.

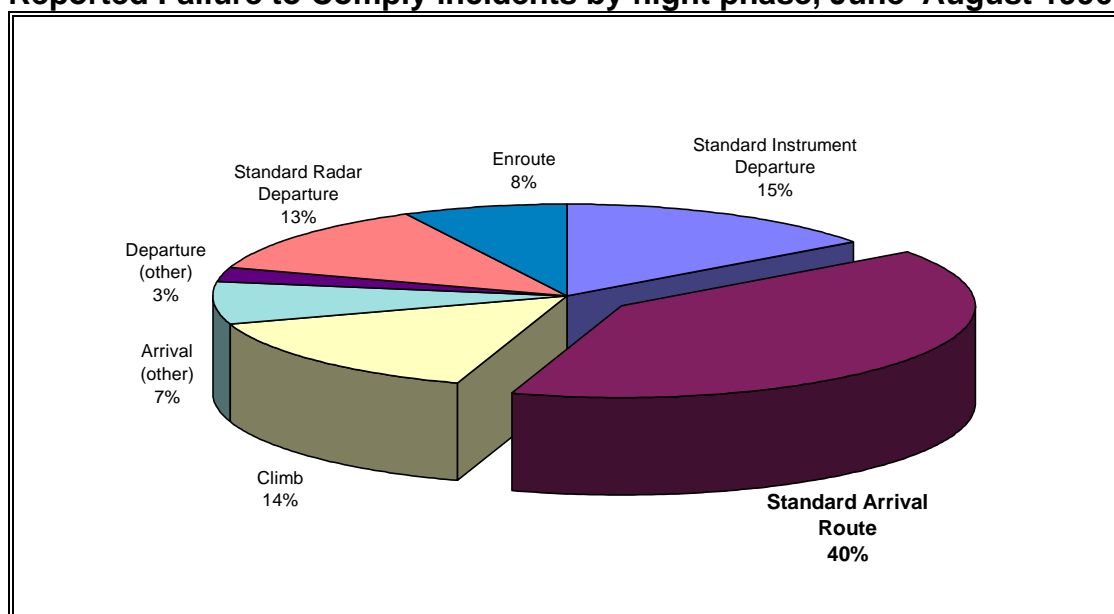
5. ANALYSIS OF SURVEY RESPONSES

Responses to the Incident Report Form were a major source of information for this study. Unedited extracts from 11 of these appear in this report (see below). The responses provided information on the factors contributing to FTC incidents and suggestions to prevent further incidents. The results of the survey are presented below.

5.1 Nature of Failure to Comply incident

In the survey, the pilots were asked to categorise their incident into one of seven phases of flight. Figure 5 illustrates their responses, showing that the greatest number of reported FTC incidents occurred while flying a STAR. These accounted for 40% of all FTC incidents during this period.

FIGURE 5
Reported Failure to Comply incidents by flight phase, June–August 1996



5.2 Factors in Failure to Comply incidents

The pilots were asked to provide an account of why their incident occurred. The reasons given can be grouped into the following categories:

- *Misunderstanding of ATC instructions.* This was due to language difficulties between ATC and the pilot, and also the use by ATC of abbreviations and terminology with which pilots were unfamiliar. Example 1 illustrates the type of difficulty experienced by some foreign crews.

EXAMPLE 1

Pilot report ref. ADE_00071

The aircraft's clearance was amended due to military action at Woomera. The pilot failed to fly from Ardrossan direct to Ayers Rock as instructed and instead continued to track as originally cleared, heading the aircraft towards Woomera.

'I've misunderstanding about clearance "ADE-AR-AYERS ROCK". Because there is no word "DIRECT" on this clearance [from "AR" to "AYERS ROCK"] that mean I have to fly follow the airways [AR-WOOMERA-AYERS ROCK]...I have difficulty about pronounce & slang.'

- *Pilot distraction.* Pilots were distracted by a number of factors, including passengers, weather, ATC communications, preoccupation with aircraft serviceability, and engine management.
- *Lack of concentration/attention by pilots and crew.* Several pilots mentioned their lack of attention, with particular emphasis on attention to altitude requirements. Example 2 illustrates how one crew was distracted by en-route weather conditions, causing non-compliance with ATC instructions.

EXAMPLE 2

Pilot report ref. SYA_01113

The aircraft was issued with a JET 4 departure which requires the aircraft to turn right at 800 ft and intercept and track by the 163 radial. However, the aircraft turned left to intercept the 102 radial.

'The crew was very concerned about the weather conditions for takeoff and departure. We actually had a loss of airspeed during takeoff, and turbulence was encountered once airborne. These facts took away some of our attention from the SID.'

- *Flight Management System input errors,* as illustrated in example 3.

EXAMPLE 3

Pilot report ref. SYA_01085

Aircraft was given route YSSY RIC NYN; however, the aircraft incorrectly attempted to track YSSY RIC MDG NYN.

'Checking of the FMGS data routing was inadvertently skipped and we flew on the wrong data routing to MDG.'

- *Failure to confirm instructions.* Generally, this problem arose where clearances were amended and the operational status of the prevailing procedure was not confirmed.

5.3 Air Traffic Control instructions

Throughout the survey responses, pilots reported various problems with the delivery and confirmation of ATC instructions. Several pilots commented on the potentially dangerous practice of assuming ATC's intentions without seeking confirmation. Example 4 illustrates how a false assumption on the part of the aircrew can lead to an FTC incident.

EXAMPLE 4

Pilot report ref. SYE_00029

The aircraft failed to comply with the vertical requirement of the LETTI 3 arrival at YANGO.

'I understood that altitude restriction of "YANGO" is cancelled by instruction to descend to 10,000 ft.'

Table 3 indicates that of the 38 incidents where information is available, the original clearance or instruction was cancelled or modified in 17 cases (or 45%). In 1992, the Ratner review of Air Traffic services recommended that air traffic management in Australia be standardised, even if this resulted in a loss of 'personalised' service to pilots. The implementation of this recommendation could be achieved in part by 'running the system on rails' with the use of STARs and SIDs. The limited data presented in table 3 suggests that Airservices Australia has not yet fully embraced the concept of standardised procedures as advocated in the Ratner review.

TABLE 3

'Was the original clearance/instruction modified in any way or cancelled?'

| | Yes | No | No answer |
|-------------------|-----|----|-----------|
| SID | 2 | 4 | 0 |
| STAR | 9 | 5 | 2 |
| Climb | 1 | 5 | 0 |
| Arrival (other) | 2 | 1 | 0 |
| Departure (other) | 1 | 0 | 0 |
| SRD | 2 | 3 | 0 |
| En route | 0 | 3 | 0 |
| Descent | 0 | 0 | 0 |
| | 17 | 21 | 2 |

Analysis of data relating to BASI's preliminary study of advanced-technology aircraft supports the above figures. Pilots have mentioned several cases of Sydney ATC taking aircraft off the RIVET 3 ARRIVAL and placing them on the OAKDALE 2 ARRIVAL. Instructions such as these cause many pilots to feel that ATC, and Sydney ATC in particular, do not fully appreciate the capabilities and limitations of automated aircraft. Pilots are concerned that ATC are unaware of the amount of time required to reprogram the FMC whenever a major change in clearance is given. Further evidence of ATC's

lack of appreciation of FMC capabilities are the frequent instructions for pilots to simultaneously reduce speed and descend, a procedure with which it is difficult to comply.

The study also shows that pilots are not satisfied with the delayed assignment of runways at Sydney and that frequently a change of assigned runway is given within 20 NM. Pilots prefer to know the runway assignment as early as possible, ideally before they commence descent, and where possible before reaching 50 NM from the airfield. This reduces the need for further FMC programming or manual intervention by the pilot, and consequently reduces cockpit workload at the one of the busiest stages of the flight.

The FTC study reveals three incidents where the pilots of automated aircraft had pre-programmed the FMS in anticipation of an airways clearance. This practice of pre-programming an expected clearance allows the best possible top of descent point and subsequent descent profile. On these three occasions the aircraft followed the programmed route contrary to ATC instructions, as illustrated in example 5.

EXAMPLE 5

Pilot report ref. SYA_01078

Aircraft was inbound to Sydney on the RIVET STAR and at TAMMI commenced a right turn of about 60 degrees instead of continuing to the VOR.

'It would be helpful if it was made clear at what point the STAR would be cancelled on favour of radar vectors, i.e. "Expect radar vectors after TAMMI".'

5.4 Familiarity with procedure

The majority (67.5%) of respondents had previously carried out the particular procedure, and all pilots had flown to the destination on at least one other occasion. Furthermore, 75% of pilots stated that they had flown to the destination at least three times in the previous year.

Ninety-two per cent of HCRPT crews fly a SID on most or all flights, while 81% of crews fly a STAR on most or all flights.

5.5 Route briefing

An accurate route briefing should prepare the flight crew for potential contingencies en route. Twenty-five per cent of crews did not refer to any route briefing material prior to the flight.

Of the pilots carrying out the procedure for the first time, 46% did not refer to a route briefing. Furthermore, one respondent who was flying the procedure for the first time and *did* receive a route briefing, felt that the material referred to was not adequate. Similarly, 28% of the pilots who referred to a route

briefing felt that it did not adequately prepare them for the ATC instructions received during the flight within Australian airspace.

5.6 Charts and instrument plates

All respondents were using charts and instrument plates appropriate for the procedure being undertaken. In all but one HCRPT incident, Jeppesen charts were used. In the one other incident of this nature, Aerad charts were used. In contrast, Jeppesen charts were used in approximately one-half of the non-HCRPT incidents, with Airservices Australia charts being used in the remaining incidents of this nature.

Two respondents claimed to have had problems with the procedures or charts, which made it difficult to comply with ATC requirements. In both of these incidents, Jeppesen charts were used. In each case, ATC gave clearance to an altitude lower than that specified in the charts. As a result, the pilots incorrectly assumed the altitude restrictions of the STAR were overridden by the ATC instructions.

Example 6 illustrates the potential for misunderstanding between ATC and aircrews.

EXAMPLE 6

Pilot report ref. SYA_01100

The aircraft was cleared by a RIVET 3 ARRIVAL to Sydney. The STAR states that the aircraft will reach 8,000 ft by TAMMI. The aircraft was given a clearance to 7,000 ft and then later an amendment was given to maintain 10,000 ft. Clearance was then given to 6,000 ft. At TAMMI the aircraft was on descent through 9,500 ft.

'The changes in descent levels without clarification after the amended maintain 10,000 ft and the later clearance to 6,000 ft that we were still required to be at 8,000 ft over TAMMI.'

However, the correct wording of Jeppesen Airways Manual 10-2G states that aircraft will be 'at or below 8,000 ft' at TAMMI.

Similarly, the pilot involved in example 4 believes that there is the possibility of a misunderstanding when a lower altitude clearance than that specified in the STAR is given. Upon receiving the clearance, the pilot states that he 'might consider the [alt] restriction is cancelled'.

5.7 Equipment failure

Equipment failure was reported to have occurred in four incidents. Of these, two were non-high capacity incidents where it was reported that the VHF 1 communication failed and was remedied by switching channels. In three of the four cases, the failure contributed to the incident. Example 7 illustrates how equipment failure can contribute to an FTC incident.

EXAMPLE 7

Pilot report ref. SYA_01092

Due to several flight level changes and the failure of the autopilot to level off, the pilot's attention was diverted from the requirements of the STAR and the pilot subsequently failed to turn the aircraft right as required.

'Autopilot failed to level off as desired (could be due to high descent rate). A/c went through FL190. The failing was discovered about 200 ft below FL190 by the pilot. Pilot took over control manually.'

5.8 Potential improvements

The survey provided pilots with the opportunity to suggest improvements which might prevent the incident occurring in the future. These suggestions fall into two groups:

Air Traffic Control improvements

- ATC should clarify all amendments. Pilots believe that a confirmation of continuation, or cancellation, of a procedure should be made at each amendment. This is particularly relevant where altitude restrictions may be involved. This action may reduce the confusion associated with amendments to STARs, as illustrated by example 6.
- ATC should be more aware of the capabilities of FMC aircraft and provide instructions that reflect these capabilities.
- Regular cross-checking of altitude and location should be conducted between ATC and the pilot. This should facilitate the earliest possible detection of potential errors.
- Information relayed to the flight crew should be simpler and clearer. (This suggestion was made by many of the international crews.)
- Information should be timely. Firstly, any information to crews should be provided early enough for the crew to respond appropriately; and secondly, where an incident has occurred, ATC should respond quickly to limit that incident, using regular cross-checks as outlined above.

Pilot/crew improvements

- *Flight crew should increase their concentration.* Several pilots felt that an increase in their concentration level would help avoid future incidents, as illustrated in example 8.

EXAMPLE 8

Pilot report ref. MLE_00389

WHAT CHANGES COULD BE MADE TO PREVENT THIS INCIDENT HAPPENING IN THE FUTURE?

'More diligence on behalf of pilot.'

- *Flight crew should give greater attention to autoflight data input. Several pilots suggested that flight plans are not checked properly. Regular cross-checks with ATC on actual position should be referenced against autoflight data to ensure that the correct route is being flown, as illustrated in example 9.*

EXAMPLE 9

Pilot report ref. SYA_01086

WHAT CHANGES COULD BE MADE TO PREVENT THIS INCIDENT HAPPENING IN THE FUTURE?

'Ensure that inserted inbound routes are complying with instructions when using LNAV and autoflight system.'

- *Flight crew should obtain correct and complete information. Some pilots commented that further pre-flight briefing would have assisted in avoiding the incident. Additionally, several pilots felt that they should have obtained further clarification from ATC especially with regard to operational status of STARs and SIDs following amendments to their original clearance, as illustrated in example 10.*

EXAMPLE 10

Pilot report ref. SYA-01089

All Sydney arrivals and departures were operating on RW 16L and 16R. The aircraft was given a SID departure for RW 34L from Sydney. Therefore, the SID was inappropriate. The pilot assumed that the information received was correct, but should have realised that it was inappropriate for that runway.

'I was aware that a WMD7 SID was not apparently applicable to R/W 16R (confirmed by FMS database and Aerad SID book) but incorrectly assumed that as no change of instruction had been given by either Delivery, Ground or Tower Controllers, the routing was the desired one.'

WHAT CHANGES COULD BE MADE TO PREVENT THIS INCIDENT HAPPENING IN THE FUTURE?

*'A) As an aircraft commander, to ask for qualification of any Air Traffic Control clearance that has ambiguity or potential for error or misunderstanding.
B) If prevailing conditions change a clearance status, then it is also incumbent on any Air Traffic Control unit to make sure an aircraft has a correct and appropriate Air Traffic Control airways clearance.'*

Other suggestions

- One suggestion called for the introduction of altitude alert lights on light aircraft. The absence of an alerting system contributed to an incident where, due to the pilot carrying out engine management tasks, monitoring of altitude was overlooked and a subsequent altitude bust occurred. Example 11 highlights one of the difficulties faced in single-pilot IFR operations.

EXAMPLE 11

Pilot report ref. SYA_01114

WHAT CHANGES COULD BE MADE TO PREVENT THIS INCIDENT HAPPENING IN THE FUTURE?

'One thing that is lacking in most light aircraft is that the assigned altitude indicators do not have altitude alert. I think if these were fitted then if altitudes were exceeded it would be only by 200 ft as there are times in the single pilot IFR environment that the pilot can be busy with a low altitude restriction.'

6. CONCLUSIONS

Failure to comply incidents have been analysed through the use of the Incident Report Form questionnaire which has provided a valuable source of information. The questionnaire has been instrumental in ascertaining pilots' views not only on the incident, but also on potential improvements.

The findings of this study confirm the trends identified in the preliminary study. The overall rate of incidents based on total movements is small. However, the incident rate at Sydney is of concern as on average there were two incidents per week involving HCRPT aircraft. Therefore, it is important that the underlying factors responsible for the incidents be identified and steps taken to address them.

Many of the incidents involved altitude requirements of STARs. In general, the problem arose when ATC issued altitude amendments but no confirmation of the continuation, or cancellation, of the STAR was given. It appears that some air traffic controllers assume that the pilots are aware of the operational status of the STAR, when on some occasions this has not been the case. Equally, pilots have misinterpreted ATC's altitude clearances, resulting in the assumption that STARs are no longer active. This has also caused failures to comply where pilots have incorrectly ceased the STAR and have expected vectors for the approach. Additional information gathered from a preliminary study of automated technology aircraft supports this analysis. In that study, several pilots commented that once a STAR is cancelled it should not be resumed. Furthermore, examples were given where aircraft were taken off a STAR and placed on a different STAR, causing aircraft to miss the altitude restrictions of the later STAR. It was also noted that STAR design was not consistent at all locations. Many STARs culminate with the expectation of radar vectoring to final approach where others position the aircraft to join an instrument approach.

The results of this study suggest that Airservices Australia has yet to fully embrace the concept of standardised traffic management procedures advocated in the Ratner review of 1992. Although standardised approach and departure procedures have been introduced since the review, the benefits of this standardisation may be lost if controllers regularly modify or interrupt these procedures.

Similar problems exist with SID procedures. Incidents have occurred in Sydney involving aircraft flying the incorrect SID for the particular runway, resulting in the aircraft turning toward the incorrect VOR radial. Two FTC incidents occurred when aircraft operating a SID were given an amended clearance, causing the pilot to assume the SID was no longer applicable. Again it appears that communication between ATC and the pilot is a contributing factor to these FTC incidents.

The charts and instrument plates do not seem to be an area of concern, as only 5% of respondents claimed to have any problems with them. While the

proportion of Jeppesen charts used during these incidents was high, it should be remembered that almost all aircraft movements at Australia's major airports using these charts are conducted without incident. Similarly, failure of aircraft equipment was not a significant factor in FTC incidents.

On an airport-by-airport basis, Sydney has maintained its relatively high level of reported FTC incidents. Of continuing concern is the rate of error regarding SIDs and STARs. In the first 5 months of 1994, there was only one FTC incident at Sydney airport. With the introduction of STARs and SIDs in 1994 and 1995 respectively, FTC incidents rose significantly. Since that time, the number of FTC incidents has remained on average at over 10 per month. The majority of these incidents resulted from misunderstanding ATC instructions for altitude amendments. A solution to this problem was suggested by several flight crew. They feel that confirmation of altitude requirements and the operational status of STARs should be given whenever an altitude amendment is made. The pilots believe this will alleviate the confusion surrounding the operational status of the altitude requirements of STARs and SIDs.

Pilots indicated that the responsibility for FTC incidents can be apportioned between themselves and ATC. It is clear that the majority of the pilots believe the main area of concern is lack of communication. Improvements are required from both ATC and pilots to correct this problem. All pilots, and foreign pilots especially, require ATC instructions to be clear and simple, and where possible, to be free from unfamiliar abbreviations and terminology. It may also be necessary to increase the number of cross-checks, particularly when altitude amendments have been made.

Since the end of the 3-month study period, the Bureau has used the ESIR system to continue monitoring FTC incidents in Australia. Appendix 3 shows that the trends identified in this study are continuing. It appears that these trends will continue until measures are taken to address the situation.

7. RECOMMENDATIONS

As a result of this study the Bureau of Air Safety Investigation issues the following recommendations:

R970010

The Bureau of Air Safety Investigation recommends that Airservices Australia:

1. Review the current methods of flow control management with the aim of minimising the need for vectoring aircraft within the STAR environment.
2. Minimise the practice of instructing aircraft to resume a STAR once vectored off the STAR.
3. Ensure that SIDs and STARs, at all locations, are developed in accordance with consistent design principles.
4. Maximise the use of ICAO standard radio phraseology in accordance with accepted worldwide practice.
5. Ensure that STAR design is compatible with aircraft FMS programs, especially for STARs which are not runway specific.

R970011

The Bureau of Air Safety Investigation recommends that the Civil Aviation Safety Authority require all international RPT AOC holders to include comprehensive route briefings in their General Operations Manual and require their aircrew to review comprehensive route briefing material prior to each flight to Australia.

APPENDIX 1 - INCIDENT REPORT FORM

INCIDENT REPORT FORM (FTC060896)

**IMPORTANT - PLEASE COMPLETE THIS FORM AND RETURN IT TO
BASI WITHIN 48 HOURS**

| | |
|---|-------------------------------|
| Details of the pilot in command. | |
| Name..... | Telephone Number (Day)..... |
| Address..... | Telephone Number (Night)..... |
| | Fax Number..... |
| | Email address..... |

| | |
|-------------------------------------|-------------------------------|
| Details of the pilot flying. | |
| Rank..... | |
| Name..... | Telephone Number (Day)..... |
| Address..... | Telephone Number (Night)..... |
| | Fax Number..... |
| | Email address..... |

- a. Read all questions carefully.
- b. **TICK** the appropriate response. eg
- c. Where written information is required, please write your answer within the space provided.
- d. You may respond by ticking **MORE** than one box.

1. This incident happened while flying,

- | | |
|--|---|
| <input type="checkbox"/> a SID (Standard Instrument Departure | <input type="checkbox"/> a SRD (Standard Radar Departure) |
| <input type="checkbox"/> a STAR (Standard Arrival Route) | <input type="checkbox"/> Enroute |
| <input type="checkbox"/> Climb | <input type="checkbox"/> Descent |
| <input type="checkbox"/> Arrival other (Please specify)..... | |
| <input type="checkbox"/> Departure other (Please specify)..... | |

2. Please describe what happened. Try to give as much detail as you can.

.....
.....
.....
.....

3. In your opinion, **WHY** did the incident happen?

.....
.....
.....
.....
.....
.....

4. Which of the following were engaged/disengaged at the time of the incident? Please tick.

| | Engaged | Disengaged |
|------------------------|---------|------------|
| Auto Pilot | | |
| Auto Throttle | | |
| Flight Director System | | |
| VNAV | | |
| LNAV | | |

5. Did you have any difficulty understanding the air traffic controller's instruction?

Yes No

If Yes, please explain further

.....
.....
.....
.....
.....
.....

6. What charts or instrument procedure plates were being used at the time of the incident?

.....
.....
.....
.....

7. Who published the charts or instrument procedure plates that were being used at the time of the incident? Please tick.

Jeppesen Airways Manual
 Airservices Australia - Departure and Approach procedures
 Other. Please specify.....

8. Were there any problems with the procedures or charts which made it difficult to comply with Air Traffic Control requirements?

Yes No

If Yes, please explain further

.....
.....

.....
.....
.....
.....

9. Have you ever carried out this procedure before?

Yes No

If Yes, when did you last perform this procedure?

.....

10. How often do you fly to this destination?

.....

11. Did you refer to any 'route briefing' (audio visual or printed) material in preparation for this flight?

Yes No

11a. If Yes, did the briefing material prepare you for the air traffic control instructions you received during this flight?

Yes No

Please comment further.

.....
.....
.....
.....

12. When was the briefing carried out for this particular procedure? (eg. approximately 10 minutes before top of descent, approximately 15 minutes before push back)

.....

13. Was the original clearance/instruction modified in any way or cancelled?

Yes No

If Yes, please explain further

.....
.....
.....
.....
.....

14. How often do you fly a SID, STAR or SRD? Please tick where applicable.

| | SID | STAR | SRD |
|--------------|-----|------|-----|
| Every flight | | | |
| Most flights | | | |
| Seldom | | | |

15. Did any aircraft equipment fail or disengage prior to this incident?

Yes No

If Yes, please explain further

.....
.....
.....
.....

16. What changes could be made to prevent this incident happening in the future?

.....
.....
.....
.....
.....

Please return this form to BASI via,
1. Fax on 06 2471290, or
2. Address a business sized envelope to
BASI,
Reply Paid 84
FTC INC,
Bureau of Air Safety Investigation,
PO Box 967,
CIVIC SQUARE ACT 2608. AUSTRALIA

NO POSTAGE IS REQUIRED IF POSTED WITHIN AUSTRALIA.

If you have any specific questions regarding this report please contact
Peter Wiggins by telephone at
06 274 6460,
Fax 06 247 1290, or
Email PWiggins@email.dot.gov.au

APPENDIX 2 - SURVEY RESPONSES

Question 1

THIS INCIDENT HAPPENED WHILE FLYING....

| | HCRPT | Non-HCRPT | ALL INCIDENTS |
|-----------------|-------|-----------|---------------|
| SID | 6 | 0 | 6 |
| STAR | 15 | 1 | 16 |
| CLIMB | 2 | 4 | 6 |
| ARRIVAL - other | 0 | 3 | 3 |
| DEP - other | 0 | 1 | 1 |
| SRD | 2 | 3 | 5 |
| ENROUTE | 2 | 1 | 3 |

Question 2

PLEASE DESCRIBE WHAT HAPPENED. TRY TO GIVE AS MUCH DETAIL AS YOU CAN.

1 3/8/96 SYA_01059

The crew was distracted from level off @050 due to instructions from ATS and read back. Moments prior to reaching our assigned alt (A050) on the Jet 3 SID we received instructions to turn to 090 to join the 059R to Nobar. I was then asked by Flying Pilot, the F/O to tune in the VOR to fulfil this request. At the time the ATS asked if we were at A050, I said "Alt" to my F/O and told him to "descend now". When ATS called and asked alt, we had reached approx 5780 - 5800 and no higher. We descended back toward A050, but ATS told us to maintain 5500'. Just prior to being asked if we were at 050, we were given traffic and I acknowledged visual contact at 1030 position and 1.5 to 2 miles. Using std SAT take off procedures our aircraft performance was very good due to out lower weight (approx 275m3) and cool temp (approx 13C). When instructions were given, our climb was approx 2500' - 3000' per min. The F/O was flying, and he was distracted by the ATS instructions as was the Flt Eng who was monitoring both the radio instructions and aircraft instruments. Due to rate of climb and the ATS instructions all happening within a matter of seconds, we exceeded our assigned alt by approx 800'. We apologise for this incident.

2 6/6/96 PHA_00891

On being cleared to 4000' I selected 3000' on the assigned altitude selector. I had just adjusted the altitude panel lights prior to landing. I may have been distracted when pax asked me a question around the time of the instruction. I acknowledged the 1000' to go signal at 4000' and continued descent toward 3000'. I reached 3300' when I was asked by approach to confirm I was maintaining 4000', I replied negative - understand cleared to 3000'. I immediately climbed toward 4000'. At 3800' I was asked by approach to verify altitude. I replied 3800' and was told to maintain 3800'. After the conflict had passed I was cleared for a visual approach to RWY 11.

3 8/6/96 CSA_00273

Whilst taxiing Cairns Ground asked if I would accept an A2 intersection departure, which I declined. I was instructed to contact Tower who cleared me to 'back track and expedite due traffic on final'. I back tracked as quickly as possible, called ready and as I turned the aircraft to line-up was given an instruction that I recall as "turn left heading 130 degrees, climb to 2000 feet clear for take-off". I acknowledged, set the aircraft's heading bug and assigned altitude indicator and took off.

On contact with Cairns Departures I advised that I was turning left heading 130 degrees on climb to 2000 feet. I am familiar with the terrain surrounding Cairns and was aware that heading 130 degrees was taking me towards high terrain, however I was not concerned at the time because the prevailing conditions enabled me to remain visual with the tops of the highest terrain. I assumed ATC had given me that heading to clear the departure path for runway 15. My airways clearance was for Hamilton Island via Innisfail, track 153 degrees. I noted during my pre-take off brief that the radar 7 departure runway 15 indicates headings between 030 and 350 degrees but assumed ATC could assign other headings depending on the prevailing conditions. Passing abeam the Cairns City Centre I was considering requesting a change of heading due to the terrain (although I estimated that my rate of climb would enable me to clear the terrain) when Departures asked me to "confirm turning onto heading 030 degrees". I acknowledged and commenced the turn. I was then asked if I was visual, which I confirmed. During the turn I became concerned that the misunderstanding regarding the heading may have been my fault (ie that I had incorrectly set the heading bug as I turned the aircraft to line up) and was concentrating on what had been said between myself and ATC. I was flying the aircraft by hand, visually and did not pay enough attention to the altimeter. After completion of the turn I noticed that the altimeter was indicating 2600 feet (rate of climb approx 1000 fpm), I momentarily levelled off and was about to commence descent back to 2000 feet when I was cleared to 7000 feet.

I do not have a clear recollection of my read back of departure instructions to the Tower, however I am certain that I advised the Departures Controller that I was turning onto heading 130 degrees as I was reading straight off the heading bug which was set on 130 degrees.

4 13/6/96 MLE_00351

The requirement issued by air traffic control was received after the descent was initiated. When it was apparent that we were not going to meet the requirements a vector of 250 was given and we commenced a rapid descent to 9000' immediately. We were then vectored back to intercept the runway 16 localiser for an ILS approach. Melbourne was experiencing foggy conditions on this particular night.

5 14/6/96 CGT_00181

<< No reply >>

6 22/6/96 CSA_00278

I maintained 6500' as instructed by app controller then he gave me instruction "Track DME14". I understood it as "descent 4500' at 14DME in DME arr." at the position about DME22-23 off CS. While descending 5500' I received ATC "maintain 5500' from app controller then I did so. (At that time, it was VMC condition around the aircraft. I saw the terrain clearly)

7 23/6/96 MLA_00543

Correct QNH not set at transition lvl. When maintaining 3000' assigned alt - actual alt 2500' (QNH = 995).

8 23/6/96 SYE_00029

After contact with SYD arrival we requested descent at 140NM from SYD VOR. We track inbound 161 and during descent to 10000' which ATC instructed us to maintain 11000' so we follow the ATC's instruction and maintain that altitude.

9 25/6/96 MLT_00060

After departing RWY 35 Melb, I was cleared to overhead the ML VOR and to 3000'. Further three heading alterations occurred in a short space of time as I approached 3000'. My scan was temporarily distracted and I picked up the penetration just as ML TWR also picked it up at 3600'. On arrival at SWH I contacted the controller involved, and also notified the company.

10 25/6/96 ADA_00073

After extensive weather avoidance aircraft cleared to 9000 feet. Aircraft then cleared to 3000 feet. Before reaching 3000 feet cleared to 2000 feet for the ILS (we understood)

Jepp plate for ILS 23 states: aircraft from N/W may be radar vectored by ATC for ILS intercept at 2000 feet. I assumed this was happening.

Workload high due weather avoidance, some wind shear/turb also warned by ATC possible hold.

We were discussing holding as...

- (1) in the hold we want to be 240 kts approx clean (for noise and fuel consideration)
- (2) at the same point on final app I need to be 170 kts & landing configuration.

We were working out the best way to fly this in case of (a) holding or (b) being cleared straight in.

Also with EFIS/FMS aircraft once having captured the ILS, much reselection/programming is required to come out of ILS capture/enter hold/recapture ILS and close in holding for us is unusual.

I think in general higher level holding further out is preferable where possible.

I apologise if we appeared to ignore ATC instructions but we both understood the clearance to be "cleared to 2000 feet for the ILS" (not on the ILS).

Outside of Australia a step descent on the ILS is most unusual, it entails more R/T and means the aircraft has to level at say 2000 feet (going above the G/S) is unable to get further clearance due ATC R/T congestion.

Would it be possible to just clear the aircraft to 3000 feet and when on a suitable heading "clear ILS 23" ? Avoiding the step descent.

Also if holding required is it possible to hold at a higher level further out ?

11 27/6/96 SYA_01070

The PF followed CHEZA 2 arr in managed des mode. According to a/c displays over WHALE we were at 8200' in alt capture mode (alt*) with decreasing vis.

12 1/7/96 SYA_01074

Confirmed: CHEZA II arrival

Altitude: Cannot confirm or deny; however A080 not substantiated. RWY changes and circuit patterns in evidence and therefore alt requirements changed.

13 2/7/96 SYA_01075

We were tracking as per STAR in LNAV/VNAV - RIVET 3. Height and altitude controlled by radar. We comply to radar alt clearance.

14 4/7/96 SYA_01078

Prior to TAMMI ATC passed "Expect radar vectors downwind". The LN was routed TAMMI - CF RW34L. We were watching traffic on approach 34R. At TAMMI a/c commenced a R7 to CF RW34L. We asked ATC can we proceed base leg or continue into VOR. ATC said "Continue in toward VOR". Turn was immediately reversed. Conditions ____ and no

conflicting traffic seen. Shortly afterwards ATC gave vectors 150 D/W and handed off to next controller. No comment was made at the time.

15 13/7/96 PHA_00916

In the FMS was preloaded STAR for arrival into Perth instead of FPL track to PH VOR. The crew failed to check that this is not in compliance with FPL. There was not any instructions or clearance from ATC to follow to PH VOR or to perform STAR.

16 17/7/96 SYA_01085

FMGS database on the aircraft had a routing after Richmond RCH-MDG-NYN (route H202) on database cycle 20June-18July. However, Computer Flight Plan had routing on UH226 (RCH-NYN). Aircraft was flown according to FMGS data routing. Hence ATC queried our route after RCH.

17 21/7/96 SYA_01086

The reason was the flying pilots finger problem in programming the approach.

18 25/7/96 SYA_01092

RIVET 3 arr was given and instruction to descent to FL210 was initially issued but changed to FL190 and FL160 subsequently when very close to RIVET. Autopilot did not level off a/c at FL190 but went through (reasons unknown) manual cont. was initiated. After entering hold at RIVET, a new heading was given by radar. Then follow by radar vector to TAMMI, a further clearance "Direct to TAMMI, RIVET 3 arr" was issued when few miles from TAMMI. Pilots were looking out for many other traffic around for safe separation. A/c went through TAMMI, without turning right to Syd.

19 25/7/96 SYA_01093

We had taken off 16R on a R15SID with 5000' initially when reaching about 10DME SY, we assigned another higher altitude. These altitude instructions, made us think that altitude restriction on SID chart came to no longer effect. So, I decided to turn right at 10 DME SY without any altitude concern.

20 25/7/96 SYA_01089

Sydney clearance delivery issued us with a West Maitland 7 SID for departure. We were cleared to taxi by SYD GMC to runway 16L (he offered us intersection 'G' but we requested and were given intersection 'F'). On being given take-off clearance by SYD TWR we were instructed to ___ this we did on turning to intercept the radial as per WMD 7 SID. The controller as I recall removed the speed control and cleared us to climb unrestricted. Shortly after he asked us to confirm that we were on a WMD 7 SID that we confirmed, and after passing east of the coastline he cleared us direct to Coolangatta. At no stage (apart from asking us to confirm our SID) did any controller give any indication that our clearance was incorrect.

21 24/7/96 BNA_00330

When turning off the downwind 119R to BNE VOR, I was under the impression that we were cleared towards about 5 miles final for visual approach. I understand from the approach controllers report that this was not the case.

22 31/7/96 SYA_01098

We were waiting for take-off and tower control told us to go back to clearance freq. and then SYD clearance gave us a new clearance. We understood that we were cleared after airborne to track 102 radial out of SY VOR on route.

23 1/8/96 SYA_01100

<< as per attached letter >>

Whilst enroute to Sydney we were given a RIVET 3 FL330 arrival. I programmed the aircraft Flight Management System Vertical Profile to begin descent at Cullerin to be at Taral at FL250, and TAMMI at 8000' as required by the STAR. Between Taral and TAMMI we were cleared to 7000'. This was later amended to maintain 10000'. Just prior to TAMMI we were

cleared to 6000'. We then immediately commenced a descent rate of 2500 per minute. I do not recall the actual height that we passed over TAMMI.

24 9/8/96 SYA_01101

I was cleared to Sydney airport with the LETTI 3 arrival after passing YANGO as profiled. I increased descending rate to meet altitude requirement at or below 8,000'. While descending I had to use anti-icing, airspeed decreased to 250kts at 10M using speedbrake, which made me less careful about altitude restriction and resulted in altitude deviation.

25 12/8/96 SYT_00162

I was given clearance "<< A/C >> cleared to taxi to RWY34L via G2 RWY25". This clearance was repeated to ATC. On taxiway G ATC asked us to use RWY25. But due to gross weight limit, we requested to use RWY34L. Because I saw an aircraft departing on RWY25, we verified taxi clearance with ATC. ATC replied "<< A/C >> clear to RWY34L via G2 hold short RWY25". At this moment we were just passed holding line G2. ATC then came over and said "<< A/C >> stop".

26 12/8/96 PHA_00928

I was cleared to FL280 which I thought I set on the altitude alert. However when I levelled out it was at 290 which was on the altitude alert. ATC advised.

27 13/8/96 ENT_00138

After acknowledging inst from dep, I called EN TWR 125.1 at what I believed was FGN & EN RWY35 visual. Part way through the turn onto final, I realised (saw lead in strobes) I was lining up for ML RWY34. I also noted that my ADFs were not pointing to the RWY I had visual but actually EN now visual to me. I realised my error and as I started my turn back on to base for EN RWY35, EN TWR inst me to turn right. I complied, subsequently found the correct location of FGN and completed landing at EN without further incident.

28 16/8/96 MLE_00389

<< A/C >> tracked over SBG and outbound SBG to AY 041 on SBG NDB. AY VOR was turned and identified and the track intercepted. However the bug was set at 031 on both VORs instead of 041. This resulted in the aircraft intercepting the 210 radial in lieu of the 220 radial.

29 16/8/96 ADE_00071

After departure, over point "AR" proceeding to "Woomera" instead of direct to "Ayers Rock".

30 16/8/96 PFT_00178

Passing outer Harbour position visibility was restricted but still VFR. On sighting runways ahead and to my left, considered I was too close to both runways to cut across their takeoff paths.

31 16/8/96 PHA_00932

On line-up RWY24R, Jandakot Tower cleared me for take-off and make "visual departure".

32 17/8/96 SYA_01109

I could hardly catch the assigned altitude in the ATC instruction, but I believed that it was 4000' because there was no correction after PHF's repetition to the ATC. When the aircraft reached at about 6500', the ATC advised that the assigned altitude was 7000'. Then I realised for the first time that it was not 4000' but 7000'.

33 19/8/96 PFT_00179

Intended joining downwind 21R due to lack of concentration I joined base for 03L.

34 19/8/96 SYA_01112

C. A. Safety Authority reports that << A/C >> crossed WHALE at 10800'.

35 19/8/96 SYA_01113

After take off in very bad weather above 800' we turned left to intercept the 102 radial. Once the turn was initiated the controller came on to question us about the turn; we replied that we were turning to intercept the 102 radial. The controller asked us if we were turning to intercept the 126 radial and we again replied that we were intercepting the 102 radial. Then the controller came on and said to us to proceed and intercept 102 radial. The controller asked us what clearance had we received and we read it back in full form.

36 20/8/96 SYA_01114

On departure BK I was cleared for a Radar 3 Pager departure. On line up I was instructed to turn left onto a HDG 290 maintain 3000'. This I duly carried out. I was instructed to call SYD Dept, which I did, advising HDG and on climb to 3000'. The controller again advised maintain 3000' which I acknowledged.

The aircraft was light and climbing at approximately 800 - 1000' per minute. I was distracted by having to reset the mixtures and as I was resetting the aircraft passed through 3000'. I realised the altitude had been exceeded as it approached 3300' and pushed the aircraft down again to regain the correct heading. As I did this the controller cleared me to climb to 5000'. I then resumed the climb. It was then that the controller asked me if I had gone through the altitude restriction which answered that I had. He then said I have you at 3500' which I was at the time. All this happened after I was cleared to 5000'.

37 25/8/96 BNE_00860

Flight was planned on FL350 cruise with a step climb at Ikuma to FL390, as indicated in the computed flight plan. ATC had given clearance to climb to FL390, to be set before KIKEM. At FL350, cruise speed was reduced from time to time for rough air penetration. At about 50NM from KIKEM a climb was initiated. We had just crossed KIKEM at about FL385. The First Officer reported the position including passing FL380 for FL390.

38 26/8/96 SYA_01118

Crew cleared RIVET 3 STAR to Sydney. Given heading to Sydney VOR LOC deselected as not holding rad, as HDG used. FMS programmed Taral @FL 230 and 320kts, TAMMI @7000' and 250kts. Crew not aware that they passed TAMMI @9300'. All standard callouts used, briefing done, sterile cockpit talked about on previous flight.

39 26/8/96 SYA_01119

I flew over the point which is located 20DME north of SYD at FL112. There is an altitude restriction at or below 8000' if fly on STAR LETTI THREE arrival.

40 28/8/96 SYA_01120

See description of incident << as per ESIR >>. Correction to text - a/c altitude at 20DME was 10,300' not FL130.

"<< A/C 1 >> had been holding at TARAL due traffic. When it's holding was cancelled the a/c was vectored for sequencing and then instructed to intercept the 229SY VOR radial and to resume the RIVET 3 arrival. Approaching 20NM SY the altitude readout was observed to be about FL130. << A/C 2 >> was approximately 15NM SW Sydney on a rep so << A/C 1 >> was turned left to a heading of 360 to ensure separation was maintained. This was a very busy period, with high workload for all involved. Runway for arrival was 16."

Question 3

IN YOUR OPINION, WHY DID THIS INCIDENT HAPPEN?

1 3/8/96 SYA_01059

The Air Traffic Services instruction given to us as we approached assigned level distracted all three crew members just long enough for us to accidentally exceed our altitude. The ensuing request as to assigned altitude also momentarily distracted the crew members. The actual altitude warning was believed to be the trim horn at the moment but was later proven to be the altitude alert warning of an over shoot.

2 6/6/96 PHA_00891

Possibly due to lighting change at the time of selection of altitude or due to distraction from pax. asking question around the same time.

3 8/6/96 CSA_00273

1. There was a misunderstanding regarding my assigned heading.
2. I inadvertently climbed through my assigned level.

4 13/6/96 MLE_00351

The minor problem with VHF COMM1 and discussions regarding our actions in the event of an unsuccessful approach into Melbourne were distracting us from the primary task of flying the aeroplane. However I accept responsibility for my error in judgement resulting in this incident.

5 14/6/96 CGT_00181

<<preoccupied with serviceability of a/c and possible need to return to Coolangatta>>

6 22/6/96 CSA_00278

For the Air Traffic Control - It was a little difficult to understand what he wanted to mean by the word "Track DME 14".

For the pilot - I didn't confirm the meaning of the word.

7 23/6/96 MLA_00543

1. Due to several distractions before and after transition level, crew failed to set altimeters.
2. No procedural checks in cockpit or Air Traffic Control exist to verify altitude until at low altitude on or near final approach (where terrain/traffic conflict is most likely).

8 23/6/96 SYE_00029

I understood that altitude restriction of "YANGO" is cancelled by instruction to descend to 10000'.

9 25/6/96 MLT_00060

A very heavy workload just as I was approaching 3000' together with insufficient prioritising in the cockpit at the time of the incident.

10 25/6/96 ADA_00073

Aircraft proceeded as we thought the clearance was given. We did not realise that clearance below 3000' was "on the ILS".

11 27/6/96 SYA_01070

The mix IRS position used for descend calculations in managed DES mode may vary from real one after 3hrs flight, PF crosschecked it true DME readings which also have an instrument proximity. The mode C delay also may be added.

12 1/7/96 SYA_01074

In attention to altitude constraints.

13 2/7/96 SYA_01075

The controller cleared us to maintain 10,000' without further clearance until TAMMI. Then mentioned to be given radar HDG after 20DME. We were fully aware and alert on that. Altitude still controlled by radar. Then given descend to 6000', HDG 340. This was after passing TAMMI. This approximately take us to 5NM downwind of WPB of which is shown on my 'ND' point is WPB245/5NM then to 4000' then to 3000' (HDG 060 then 130) then to intercept LL2 R/W16. Asked to declare visual.

14 4/7/96 SYA_01078

It was not clear from radar <<Air Traffic Control>> instructions when the radar vectors would begin. We felt we were getting high and very close. We had assumed we would come off TAMMI into a base leg for R/W34L and that is why we asked for clarification from radar <<Air Traffic Control>>.

15 13/7/96 PHA_00916

To preload a possible STAR in FMS company route is usual practice for data base supply. When entered in the Perth area crew did not receive any specification of type of arrival. Also, they was not warned that Perth Air Traffic Control working on presumed situation.

16 17/7/96 SYA_01085

Checking of the FMGS data routing was inadvertently skipped and we flew on the wrong data routing to MGD.

17 21/7/96 SYA_01086

The F/O had programmed the app. WHALE/Centre fix R/W16L. The aircraft was flying in LNAV mode and turned towards the centre fix. Both pilots realised that was happening at the same time as the traffic controller.

18 25/7/96 SYA_01092

Compounded workload onto pilots as a result of:

1. 3 FL changes within short range from RIVET
2. Autopilot failed to level off at FL given, possibly due to high rate off descent. Pilot had to take over manually.
3. Cancelled holding at RIVET followed by radar vector due to heavy traffic. Then revert to RIVET 3 arr. + pilots were busy looking out for traffic around.

19 25/7/96 SYA_01093

After take off and before reaching 5000' and 10DME we received an amendment to our clearance to climb to a higher level. So this made me make a right turn before reaching 6000' at 10DME.

20 25/7/96 SYA_01089

(A) A basic assumption my part that the SID that had been issued to us was the correct one and indeed failing to question its validity with Air Traffic Control.

(B) Issuance of an inappropriate SID to us by Air Traffic Control and similarly failing to ensure we were issued with the correct one.

21 24/7/96 BNA_00330

I was not aware that the incident had happened until I saw the report from CASA. As far as I can recall, the ATIS reported that ILS 01 was OK, and we expected a VOR or visual approach to RWY01. I had inserted X miles on legs page_____ but I am not sure if I activated the segment from where we left the_____.

22 31/7/96 SYA_01098

The crew of the flight interpreted the first clearance received was no longer in effect after the second instructions was given.

23 1/8/96 SYA_01100

The assumption that the requirement to be at 8000' at TAMMI was not now applicable - but not clarified by Air Traffic Control or the crew.

24 9/8/96 SYA_01101

In my opinion it happened because I maintained high speed and did not control it properly considering the altitude restriction as required and did not invite Air Traffic Control cooperation in _____ for a possible deviation.

25 12/8/96 SYT_00162

Initial clearance there is no hold short instruction RWY25. When << A/C >> on G2, we got clearance hold short of RWY25. At this moment I just <<stop>> over G2 holding line.

26 12/8/96 PHA_00928

Unable to explain, but more attention is being given to altitude clearances since the incident.

27 13/8/96 ENT_00138

FNG was not lit and is hard to find. At night there is similar black spot amongst the suburban lights lined up with ML RWY34 which I obviously mistook for FNG which lines up with EN RWY35.

28 16/8/96 MLE_00389

Pilot error - incorrect track set on VOR display (031 [ML -> SAG] in lieu of 041)

29 16/8/96 ADE_00071

I've misunderstanding about clearance "ADE-AR-AYERS ROCK". Because there is no word "DIRECT" on this clearance (From "AR" to "AYERS ROCK") that mean I have to fly follow the airways (AR-WOOMERA-AYERS ROCK).

30 16/8/96 PFT_00178

Unfamiliarity with that particular area, finding ourselves on the wrong side of airport and too close to any outbound traffic that may been operating.

31 16/8/96 PHA_00932

Because I assumed that a visual departure - there was no further need to continue RADAR WEST DEPARTURE.

32 17/8/96 SYA_01109

Because I assumed the assigned altitude in the Air Traffic Control instruction to be 4000' without confirmation, in spite of that I could hardly catch it.

33 19/8/96 PFT_00179

Flew to Whyalla worked very hard for the time I was there (building trade). Flew home in marginal but safe weather. At trips end I had a concentration lapse which I have never done before and I assure will never happen again.

34 19/8/96 SYA_01112

At the moment I don't remember but maybe it happened due to the weather conditions or turbulence at the time. Sincerely, I don't remember this fact.

35 19/8/96 SYA_01113

The crew was very concerned about the weather conditions for take off and departure. We actually had a loss of airspeed during take off and turbulence was encountered once airborne. These facts took away some of our attention from the SID. We turned to radial 102 since it was in our clearance.

36 20/8/96 SYA_01114

Unfortunately this incident occurred by being distracted by carrying out engine management at a time when more attention should have been paid to maintaining altitude limitation.

37 25/8/96 BNE_00860

During step climb, as we entered smoother flight conditions, managed speed was selected which traded rate of climb for increase in speed. I had not factored in the time needed for the aircraft to regain managed speed. This had an adverse effect on climb performance.

38 26/8/96 SYA_01118

Crew not sure why. Only can assume a breakdown in monitoring aircraft glide path progress. Could be when PMS levels off at intermediate alt, throttles not closed completely resulting in a/c being high.

39 26/8/96 SYA_01119

After flying track outbound of YANGO holding pattern, we were instructed by Air Traffic Control as "DIRECT LETTI" with an assigned altitude. But the Air Traffic Control did not mention about STAR (LETTI 3 ARRIVAL). So we recognised that radar vector would be provided instead of STAR.

40 28/8/96 SYA_01120

<< Pilot received radar vectoring to 360, cancelling the STAR, then later received vector to intercept 229 radial. The pilot did not receive instr. to resume RIVET3, and at no stage confirmed this to Air Traffic Control. Pax distractions occurred throughout. >>

Question 4

WHICH OF THE FOLLOWING WERE ENGAGED/DISENGAGED AT THE TIME OF THE INCIDENT?

| HCRPT | Engaged | Disengaged | No answer |
|------------------------|----------------|-------------------|------------------|
| Auto Pilot | 21 | 5 | 1 |
| Auto Throttle | 21 | 4 | 2 |
| Flight Director System | 25 | 1 | 1 |
| VNAV | 15 | 10 | 2 |
| LNAV | 16 | 7 | 4 |

| Non-HCRPT | Engaged | Disengaged | No answer |
|------------------------|----------------|-------------------|------------------|
| Auto Pilot | 6 | 7 | 0 |
| Auto Throttle | 4 | 4 | 5 |
| Flight Director System | 5 | 4 | 4 |
| VNAV | 1 | 4 | 8 |
| LNAV | 1 | 4 | 8 |

Question 5

DID YOU HAVE ANY DIFFICULTY UNDERSTANDING THE AIR TRAFFIC CONTROLLER'S INSTRUCTION?

| | YES | NO |
|-----------|-----|----|
| HCRPT | 4 | 23 |
| Non-HCRPT | 1 | 12 |
| Total | 5 | 35 |

3 8/6/96 CSA_00273 YES

Pilots are often asked to expedite departure by Air Traffic Control. I realise that we are not obliged to co-operate, but generally we are keen to assist where ever possible. Although I am sure the Tower controller was clear with his instructions the combination of trying to be expeditious while performing line-up checks while receiving departure instructions may have led to the misunderstanding regarding the assigned heading.

6 22/6/96 CSA_00278 YES

If App Controller want "maintain 6500' until DME 14" by the "Track DME 14", the former expression is much easier for us to understand the instruction without doubt.

20 25/7/96 SYA_01089 YES

I was aware that a WMD7 SID was not apparently applicable to R/W 16R (confirmed by FMS database and Aerad SID book) but incorrectly assumed that as no change of instruction had been given by either Delivery, Ground or Tower Controllers the routing was the desired one.

29 16/8/96 ADA_00071 YES

I have difficulty about pronounce & slang.

40 8/8/96 SYA_01120 YES

<< Pilot did not receive Air Traffic Control instructions. Air Traffic Control assumed instructions were received but at no stage received confirmation from pilot >>

1 3/6/96 SYA_01059 NO

However, the Air Traffic Services instruction came at an inopportune moment with regard to rate of climb and position of the aircraft.

10 25/6/96 ADA_00073 NO

But we thought we were cleared at 2000' for the ILS.

14 4/7/96 SYA_01078 NO

However we were unsure about how we were going to be tracked to get to the runway from our position at the time. The term "downwind" was not clear from our position since we were already downwind of the runway.

15 16/7/96 PHA_00916 NO

There was not instructions. Even when the crew has to comply with FPL we used to receive "Follow FPL route" acknowledge.

21 24/7/96 BNE_00330 NO

I suppose the no answer is somewhat contradictory as the controller states that there was language difficulties involved.

27 13/8/96 ENT_00138 NO

I did however believe dep inst. me to call EN TWR turning final at FNG.

32 17/8/96 SYA_01109 NO

But it was hard for me to catch the assigned altitude at the incident.

Question 6

WHAT CHARTS OR INSTRUMENT PROCEDURE PLATES WERE BEING USED AT THE TIME OF THE INCIDENT?

All aircrews used the correct charts when the procedure was undertaken.

Question 7

WHO PUBLISHED THE CHARTS OR INSTRUMENTAL PLATES THAT WERE BEING USED AT THE TIME OF THE INCIDENT?

| | Jeppesen | Airservices Aust. | Other |
|-----------|----------|-------------------|-------|
| HCRPT | 26 | 0 | 1* |
| Non-HCRPT | 6 | 6 | 1 |
| Total | 32 | 6 | 2 |

* Aerad charts

Question 8

WERE THERE ANY PROBLEMS WITH THE PROCEDURES OR CHARTS WHICH MADE IT DIFFICULT TO COMPLY WITH AIR TRAFFIC CONTROL REQUIREMENTS?

| | YES | NO |
|-----------|-----|----|
| HCRPT | 1 | 26 |
| Non-HCRPT | 1 | 12 |
| Total | 2 | 38 |

8 23/6/96 SYE_00029

There is a possibility of misunderstanding that altitude restriction of YANGO by descent instruction of lower altitude pilot might consider the restriction is cancelled.

23 1/8/96 SYA_01100

The changes in descent levels without clarification after the amended maintain 10,000' and the later clearance to 6,000' that we were still required to be at 8,000' over TAMMI.

Question 9

HAVE YOU CARRIED OUT THIS PROCEDURE BEFORE?

| | YES | NO | NO ANSWER |
|-----------|-----|----|-----------|
| HCRPT | 17 | 9 | 1 |
| Non-HCRPT | 10 | 2 | 1 |
| Total | 27 | 11 | 2 |

Question 10

HOW OFTEN DO YOU FLY TO THIS DESTINATION?

| VISITS PER YEAR | TOTAL |
|-----------------|-------|
| 1 | 1 |
| 2 | 4 |
| 3 | 7 |
| 6 | 2 |
| 8 | 2 |
| 9 | 4 |
| 12 | 5 |
| 24 | 2 |
| 60 | 2 |
| 72 | 1 |
| 90 | 1 |
| 100 | 3 |
| 120 | 1 |
| NO ANSWER | 5 |
| Grand Total | 40 |

Question 11 & 11a

11. DID YOU REFER TO ANY 'ROUTE BRIEFING' (AUDIO VISUAL OR PRINTED) MATERIAL IN PREPARATION FOR THIS FLIGHT?

11a. IF YES, DID THE BRIEFING MATERIAL PREPARE YOU FOR THE AIR TRAFFIC CONTROL INSTRUCTIONS YOU RECEIVED DURING THIS FLIGHT?

| 11 | YES | YES | NO |
|-----------|-----|-----|-----|
| 11a | YES | NO | N/A |
| HCRPT | 13 | 7 | 7 |
| Non-HCRPT | 6 | 4 | 3 |
| Total | 19 | 11 | 10 |

PLEASE EXPLAIN FURTHER.

3 8/6/96 CSA_00273

I referred to the documents and charts normally used when operating around Cairns plus I rang the departures controller to gain approval to track Cairns direct to Innisfail (indicated as a "one way route on the charts). This was for the benefits of the pax as it is a very scenic route.

4 13/6/96 MLE_00351

The instruction was additional to the STAR procedure.

21 24/7/96 BNA_00330

The relevant charts for Brisbane Airport issued by Jeppesen was studied previously and during the approach briefing.

24 9/8/96 SYA_01101

The briefing of company NOTAM and Jeppesen manual Australia page 10-2E (19 Jan 96) were available in any approach situation.

27 13/8/96 ENT_00138

The chart (Melb VTC) is easy enough to read. The moving map outside the window of an a/c on approach in the dark with a tailwind is not always representative of this.

28 16/8/96 MLE_00389

Air Traffic instructions were clear.

29 16/8/96 ADE_00071

That's misinterpretation about the clearance between ATC & the pilot.

30 16/8/96 PFT_00178

As outlined previously, conditions were somewhat gloomy or obscured not being familiar with area. I found the position warranted tuning away to keep out of the way. I should have asked for a clearance to back track and re-enter app to 26R.

32 17/8/96 SYA_01109

Briefing materials are Jeppesen manuals, charts, NOTAM and so on.

33 19/8/96 PFT_00179
Received ATIS ERSA.

34 19/8/96 SYA_01112
I have no doubt about the STAR procedures.

37 25/8/96 BNE_00860
I have flown this route several times before and have been cleared to climb to FL390 at pilots discretion with the requirement to cross the FIR boundary at FL390.

38 26/8/96 SYA_01118
Briefing mentions that "Sydney ATC is very strict about the height requirement on the STAR".

40 28/8/96 SYA_01120
Normal review of STAR and expected approach with appropriate briefing to first officer.

Question 12

WHEN WAS THE BRIEFING CARRIED OUT FOR THIS PARTICULAR PROCEDURE?

In all incidents the briefing was carried out with appropriate concern for timing. The range of timing spanned from 5 minutes before the procedure, to 2 hours prior to the procedure. In general, the briefing was carried out in the 20 minutes preceding the incident.

Question 13

WAS THE ORIGINAL CLEARANCE/INSTRUCTION MODIFIED IN ANY WAY OR CANCELLED?

| | YES | NO | NO ANSWER |
|-----------|-----|----|-----------|
| HCRPT | 12 | 14 | 1 |
| Non-HCRPT | 5 | 7 | 1 |
| Total | 17 | 21 | 2 |

IF YES, PLEASE EXPLAIN FURTHER

4 13/6/96 MLE_00351
The height requirement at BUNKY and the speed restriction below 10000' were cancelled prior to descent.

7 23/6/96 MLA_00543
1. High speed descent assigned for flow/separation
2. High speed descent below 10000' assigned by approach control
3. Track change BUNKY to TIMZN requested and cleared.

8 23/6/96 SYE_00029

During LETTI 3 arrival, ATC vectored us to avoid CB cloud.

9 25/6/96 MLT_00060

Initial instruction was to track over the ML VOR visually. This was altered close to overhead ML by three separate heading alterations.

10 25/6/96 ADA_00073

W/X avoidance then cleared to 9000' then cleared to 3000', then cleared to intercept LOC, then cleared for the ILS.

12 1/7/96 SYA_01074

RWY changes & circuit patterns in evidence & therefore alt requirements changed.

13 2/7/96 SYA_01075

STAR - as per Jeppesen LNAV on 'ND' but the altitude was controlled by ATC.

14 4/7/96 SYA_01078

Originally told by ATC to expect STAR for RWY 16R. This was changed to RIVET STAR for RWY 34L.

15 13/7/96 PHA_00916

There was a radar vectoring.

18 25/7/96 SYA_01092

The original clearance "RIVET 3 arr, descent to FL210 and reach FL210 by RIVET" was changed to FL190 then FL160 hold at RIVET. After the hold, the holding was cancelled followed by radar vector when near the TAMMI change to "direct to TAMMI & RIVET 3 arrival".

22 31/7/96 SYA_01098

Just before takeoff they gave us new instructions.

27 13/8/96 ENT_00138

I think the radar heading was amended 10degrees (to the right) somewhere during the app.

30 16/8/96 PFT_00178

Only to clear 26L for landing.

31 16/8/96 PHA_00932

Was given radar west one departure then on line up Jandakot tower have me instructions for a "visual departure".

38 26/8/96 SYA_01118

Modified for separation. Crew given heading off STAR then put back on STAR.

40 28/8/96 SYA_01120

Original clearance was "RIVET 3 arrival" holding at TARAL with an altitude restriction was given this clearance was cancelled and holding changed to Cullerin with (I think) another altitude restriction. As we were about to enter hold at Cullerin clearance was changed again to hold at TARAL.

Question 14**HOW OFTEN DO YOU FLY A SID, STAR, OR SRD?**

| HCRPT | SID | STAR | SRD |
|--------------|-----|------|-----|
| Every flight | 12 | 10 | 0 |
| Most flights | 13 | 12 | 9 |
| Seldom | 0 | 2 | 7 |
| No answer | 2 | 3 | 11 |

| Non-HCRPT | SID | STAR | SRD |
|--------------|-----|------|-----|
| Every flight | 0 | 0 | 0 |
| Most flights | 3 | 4 | 7 |
| Seldom | 7 | 4 | 3 |
| No answer | 3 | 5 | 3 |

Question 15**DID ANY AIRCRAFT EQUIPMENT FAIL OR DISENGAGE PRIOR TO THIS INCIDENT?**

| | YES | NO | NO ANSWER |
|-----------|-----|----|-----------|
| HCRPT | 2 | 23 | 2 |
| Non-HCRPT | 2 | 11 | 0 |
| Total | 4 | 34 | 2 |

Question 16**WHAT CHANGES COULD BE MADE TO PREVENT THIS INCIDENT HAPPENING IN THE FUTURE?****1 3/8/96 SYA_01059**

In this case observing the altitude warning and paying more attention to alt control rather than Air Traffic Services instructions would have prevented the flying pilot from exceeding the assigned level of A050. All crew members were trying to be certain we were conforming to instructions and failed to observe the level off alt.

2 6/6/96 PHA_00891

1. Adjust lighting earlier.
2. Disregard pax questions at critical stage of flight.
3. Double check correct altitude set on altitude selector.

3 8/6/96 CSA_00273

None.....It boils down to human error largely.

4 13/6/96 MLE_00351

I see no necessity for making any changes in this instance.

5 14/6/96 CGT_00181

Ring tower and get a local briefing prior to departure.

6 22/6/96 CSA_00278

If App Controller want "maintain 6500' until 14DME" by the word of "Track DME 14", the former expression is much easier for us to understand the instruction without doubt.

7 23/6/96 MLA_00543

1. Reinstitute procedural cross check of QNH/indicated altitude at 5000' or other altitude between OCTA and transition LVL.
2. On initial call to appch control aircraft should advise of both assigned altitude and current altitude....(Controllers are a safety resource too.)

8 23/6/96 SYE_00029

While following STAR Air Traffic Control should more be specific about altitude restriction. (Mention about altitude restriction when deliver a descent instruction to the aircraft.)

9 25/6/96 MLT_00060

Normally on this type of departure there are few HDG alterations by Air Traffic Control so I could only suggest to simplify the departure if possible. And to improve my departure briefing and better manage workload in this environment.

10 25/6/96 ADA_00073

Normally clearance is expected to intercept the ILS on a HT & HDG. The step down procedure on the ILS is most unusual outside of Australia. It entails more R/T and possible misunderstanding. A "Clrd for ILS from 3000' " would prevent a repeat.

11 27/6/96 SYA_01070

I change the procedure for descending during SYD approaches. The crews will perform IDLE-OP DES procedure ensuring that the aircraft will be at or below prescribed altitude before reaching the point and without reference to a computed des path.

12 1/7/96 SYA_01074

Greater attention by crew.
Greater attention by Air Traffic Control on compliance.

13 2/7/96 SYA_01075

Give us height and/or altitude that is reasonable as to not infringe the STAR restricted height. As crew, we do not question Air Traffic Control on height and/or altitude clearance, as we expect their a/c separation procedures within their sector of controlled. We will comply, even though sometimes infringe STAR alt restriction otherwise we shall comply to STAR in full (track & alt).

14 4/7/96 SYA_01078

It would be helpful if it was made clear at what point the STAR would be cancelled on favour of radar vectors, ie "Expect radar vectors after TAMMI". We felt we were getting "Close and High" for R/W34L and that is why we asked for clarification. I do not challenge the Air Traffic Control controller's instructions.

15 13/7/96 PHA_00916

1. The crew always has to ask specification of the route, if it is not clearly identified.
2. The PERTH Air Traffic Control has to inform the operators that they will work on presumed manner.

16 17/7/96 SYA_01085

Crew to check both Computer Flight Plan and flight plan on the FMGS to ensure that the aircraft is flown according to the Computer Flight Plan.

17 21/7/96 SYA_01086

Ensure that inserted inbound routes are complying with instructions when using LNAV and autoflight system.

18 25/7/96 SYA_01092

1. If frequent change of FL is required, preferred earlier clearance given or a/c can also descent in the hold if required to reduce workload.
2. Once radar vector is initiated very close to the a/port while traffic is heavy, prefer remain so until on final rather than revert to STAR again while pilots are busy lookout for traffic around.
3. Pilots need to be trained on good crew coordination.

19 25/7/96 SYA_01093

I expect more coordination and advise from Air Traffic Control

20 25/7/96 SYA_01089

- A) As an aircraft commander to ask for qualification of any Air Traffic Control clearance that has ambiguity or potential for error or misunderstanding.
- B) If prevailing conditions change a clearance status then it is also incumbent on any Air Traffic Control unit to make sure an aircraft has a correct and appropriate Air Traffic Control airways clearance.

21 24/7/96 BNA_00330

1. Ensure that issued clearances are received and understood.
2. To receive clearance for the actual approach to be performed at an earlier stage, so that "assumed" procedures are not briefed and then wrongly executed.

22 31/7/96 SYA_01098

As a result of the previous misunderstanding pilots were gathered and informed and a revision of all procedures for the airports we are operating into was done. Also a memo was sent to them as a reminder.

23 1/8/96 SYA_01100

By Air Traffic Control: after descent levels given then cancelled for higher levels - confirmation that the STAR has not been varied or cancelled.

By Executive Airlines: see attached operations manual amendment 4/96 dated 7/8/96:

"The purpose of this amendment is to eliminate any doubt or confusion, and to ensure that the requirements of both the STAR and any limitations or variations, given by Air Traffic Control are clarified, able to be met, and complied with."

24 9/8/96 SYA_01101

I am terribly sorry not to observe the altitude restriction causing you trouble unnecessarily. No comment on procedure.

25 12/8/96 SYT_00162

N/A

26 12/8/96 PHA_00928

N/A

27 13/8/96 ENT_00138

Clearer identification of visual reporting points or complete ignorance of them in marginal situations relying on a pilot to spot them under IFR and in CTA in radar environment. (marginal = high traffic periods / night / poor vis etc).

28 16/8/96 MLE_00389

Nil for Air Traffic Control
More diligence on behalf of pilot.

29 16/8/96 ADE_00071

Further details of any deviation, or notice to pilots from the briefing officer.
To give instructions in clear and simple words.

30 16/8/96 PFT_00178

The fault of being in the wrong place has to be my fault only. I dare say hundreds of VFR aircraft use the same ___ and procedures without incident. They would not all be local pilots either.

31 16/8/96 PHA_00932

Every pilot that I have spoken to, and one instructor also thought that a visual departure cancelled radar departure - now I understand that while completing instrument departure to look out the window for other aircraft.

32 17/8/96 SYA_01109

If I failed to catch the Air Traffic Control instruction clearly and were in the same situation in the future, I would confirm it without hesitation.

33 19/8/96 PFT_00179

In my 310 hours of flying I have never been involved in any incident. I consider my flying by the book my one and only misdemeanour will be sufficient to ensure I will never suffer a lack of concentration again.

34 19/8/96 SYA_01112

I think that the Air Traffic Control could warn the pilot to correct quickly the situation. I don't deny the fact. My apologies for the happening.

35 19/8/96 SYA_01113

Regardless of weather conditions we need to emphasise more the details of a SID before take-off.

36 20/8/96 SYA_01114

One thing that is lacking in most light aircraft is that the assigned altitude indicators do not have altitude alert. I think if these were fitted then if altitudes were exceeded it would be only by 200' as there are times in the single pilot IFR environment that the pilot can be busy with a low altitude restriction.

37 25/8/96 BNE_00860

To initiate the climb earlier. If the cruise speed had been reduced for rough air penetration, to factor in the time adjustment for the aircraft to regain managed speed, which can affect climb performance.

38 26/8/96 SYA_01118

- If Air Traffic Control observe any possible deviation (or similar incidents) to query the crew. This way we monitor each other in the cockpit & Air Traffic Control/crew monitoring takes place.
- PMS path v PMS descent manual will get to height but sacrifice speed.
- Crew monitoring.
- Callouts.
- Sterile cockpit.

39 26/8/96 SYA_01119

If the Air Traffic Control assigns the route like "Direct LETTI", they should mention about the STAR every time, otherwise the pilots may recognise that the radar vector is provided. Maybe the words "Comply altitude restriction" can help.

40 28/8/96 SYA_01120

Controllers must ensure that there is a readback of clearances of this importance.

APPENDIX 3

FURTHER TREND MONITORING

Since the completion of the 3-month study, BASI has continued to monitor ESIRs. During September and October, FTC incidents continued to occur in line with the trends confirmed in the study period.

Figure 6 shows that HCRPT aircraft were involved in 30% of reported FTC incidents. Foreign operators accounted for 85% of all HCRPT incidents. Private aircraft were involved in 26% of incidents. There was an increase in the level of FTC incidents for commercial chartered aircraft, compared to the study period.

FIGURE 6
Reported FTC incidents by statistical grouping, September–October 1996

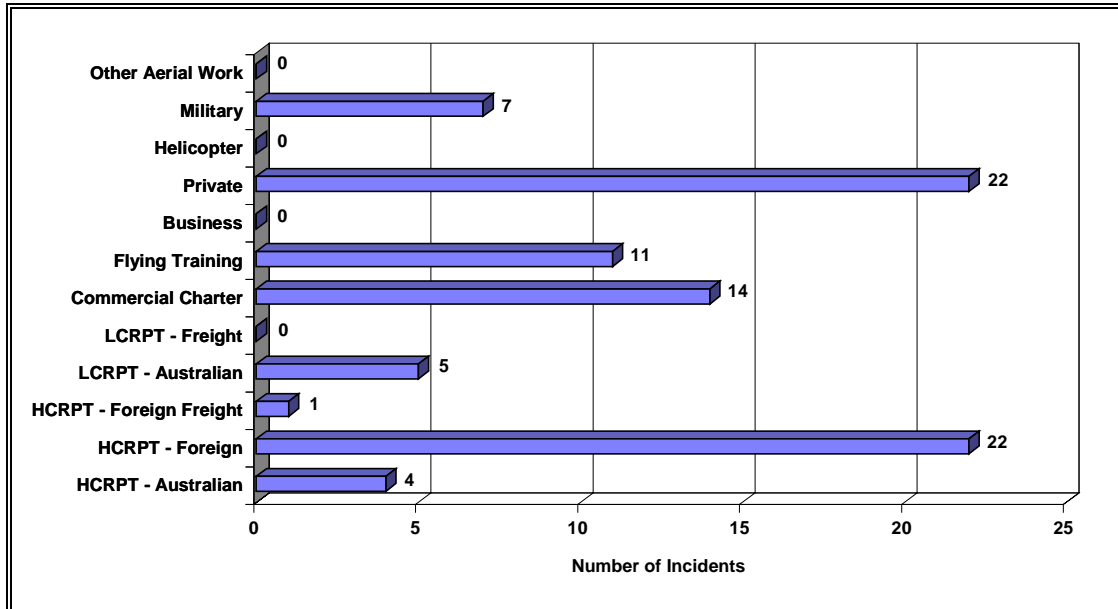


Figure 7 illustrates the distribution of FTC incidents by location. Again, Sydney accounted for the greatest proportion of incidents with 37%, an increase of 8% on the 3-month study period. The next highest level of FTC incidents occurred at Melbourne, Brisbane and Bankstown with 9% each. HCRPT incidents accounted for 53% of FTC incidents at Sydney, a decrease of 29% from the 3-month study period. In real terms however, the number of high-capacity FTC incidents in Sydney remained consistent with 8.5 per month, compared with 9.3 per month in the 3-month study period.

FIGURE 7
Reported Failure to Comply incidents by airport, September–October
1996

