BASI
Bureau of Air Safety Investigation

Air Safety Report

INVESTIGATION REPORT
9802830

Cessna 185E Floatplane, VH-HTS
Calabash Bay, NSW
26 July 1998

COMMONWEALTH DEPARTMENT OF
TRANSPORT AND
REGIONAL SERVICES

Department of Transport and Regional Services

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CONTENTS

GLOSSARY OF TERMS AND ABBREVIATIONS

AAT	Administrative Appeals Tribunal
ALA	Authorised Landing Area (includes water alighting area)
AOC	Air Operators Certificate
ASSP	Aviation Safety Surveillance Program
BASI	Bureau of Air Safety Investigation
CAA	Civil Aviation Authority
CAAP	Civil Aviation Advisory Publication
CAIR	Confidential Aviation Incident Reporting
CAO	Civil Aviation Orders
CAR	Civil Aviation Regulations
CASA	Civil Aviation Safety Authority
C185	Cessna A185E
DAM	District Airworthiness Manager (CASA)
DFOM	District Flying Operations Manager (CASA)
EST	Eastern Standard Time
FOB	Flying Order Book (South Pacific Seaplanes)
FOI	Flying Operations Inspector
hPa	Hectopascals
MAOC	Manual of Air Operator Certification
MD	Managing Director
MHz	Megahertz
NCN	Non-compliance notice
Octa	Cloud amount expressed in eighths
QNH	An altimeter sub-scale setting to show height above sea level
SPS	Aquatic Air Pty Ltd, trading as South Pacific Seaplanes

Note 1. All bearings are in degrees magnetic unless otherwise indicated.

Note 2. All times are Australian Eastern Standard time (Co-ordinated Universal Time + 10 hours) unless otherwise stated.

Note 3. For the purposes of this report Pilot Operating Handbook and Owners Manual are regarded as having the same meaning.

Note 4. Scattered cloud is equivalent to 3–4 octas.
Broken cloud is equivalent to 5–7 octas.

Note 5. 'The accident' refers to the accident near Berowra on 26 July 1998 unless otherwise indicated.

Note 6. 'The pilot' refers to the pilot in command of the accident aircraft, unless otherwise indicated.

Note 7. A reference to Berowra means the Berowra alighting area located near Cunio Point, as distinct from Berowra Waters.

INTRODUCTION

The main purpose of investigating air safety occurrences is to prevent aircraft accidents by establishing what happened, how and why the occurrence took place, and determining what the occurrence revealed about the safety health of the aviation system. Such information can be used to make recommendations aimed at reducing or eliminating the probability of similar occurrences, and where appropriate, to increase the safety of the overall system.

To produce effective recommendations, the information collected during the course of the investigation, and the conclusions reached, must be analysed in a way that reveals the relationship between the individuals involved in the occurrence, and the design and characteristics of the system within which those individuals functioned.

This investigation was conducted in accordance with the International Civil Aviation Organisation (ICAO) international standards and recommended practices for aircraft accident investigation, as described in Annex 13 to the Convention on International Civil Aviation (Chicago 1944). Particular regard was also given to the general principles of the analytical model outlined in ICAO circular 247-AN/148 (Human Factors Digest No. 10). It was not the purpose of this investigation to determine blame or apportion liability.

Experience has shown that occurrences are rarely the result of a simple error or violation but are more likely to have been due to a combination of a number of factors, any one of which by itself was insufficient to cause a safety breakdown. Common elements in any occurrence are likely to be:

- *Unsafe acts* such as errors or violations having an immediate adverse effect (generally associated with operational personnel).
- *Local factors,* related to the tasks being performed, that are likely to encourage unsafe acts. These factors can include such things as inadequate or unsafe procedures, time pressures, work culture, equipment deficiencies and environmental conditions.
- *Organisational deficiencies* associated with poor management policies and practices within organisations. Often these failures can remain dormant and unrecognised for long period.
- *Safety defences* that should have been capable of providing barriers and safeguards to detect, warn and protect the system from human and technical failures arising from the three previous elements.

An insight into the safety health of an organisation can be gained by an examination of its safety history, and of the environment within which it operates. A series of apparently unrelated safety events may be regarded as indicators of an underlying systemic failure.

SYNOPSIS

On Sunday, 26 July 1998, at about 1324 EST, a Cessna A185E floatplane, VH-HTS, crashed onto a ridge forming the southern shore of Calabash Bay NSW. The accident occurred during a go-around manoeuvre following an unsuccessful landing approach to the Berowra water alighting area. At the time of the accident the Calabash Bay area was affected by strong winds, widespread rain and showers, low cloud, and reduced visibility. The aircraft was operated by South Pacific Seaplanes and was undertaking a charter flight from Palm Beach to Berowra. All five occupants, including the pilot, suffered fatal injuries. The aircraft was destroyed by impact forces.

The investigation found that the circumstances of the accident were consistent with uncontrolled flight into terrain. The decision by the pilot to carry out a go-around into a confined area surrounded by steep-sided terrain was the culminating factor in a combination of local factors, organisational deficiencies and inadequate safety defences. Local factors included poor weather conditions, a lack of formal procedures to provide safe methods of operation, and commercial pressures. Organisational deficiencies were identified within South Pacific Seaplanes concerning the management and conduct of charter operations carried out by that company, and in the safety regulation of those operations by the Civil Aviation Safety Authority.

During the investigation a number of safety deficiencies were identified. Safety actions to address those deficiencies are currently being formulated by the Bureau of Air Safety Investigation. A description of those deficiencies, and corresponding safety actions, will be summarised in section 4 of the final report.


Accident site
Calabash Bay
Berowra Waters
Deep Bay
Berowra Creek

1. FACTUAL INFORMATION

1.1 History of the flight

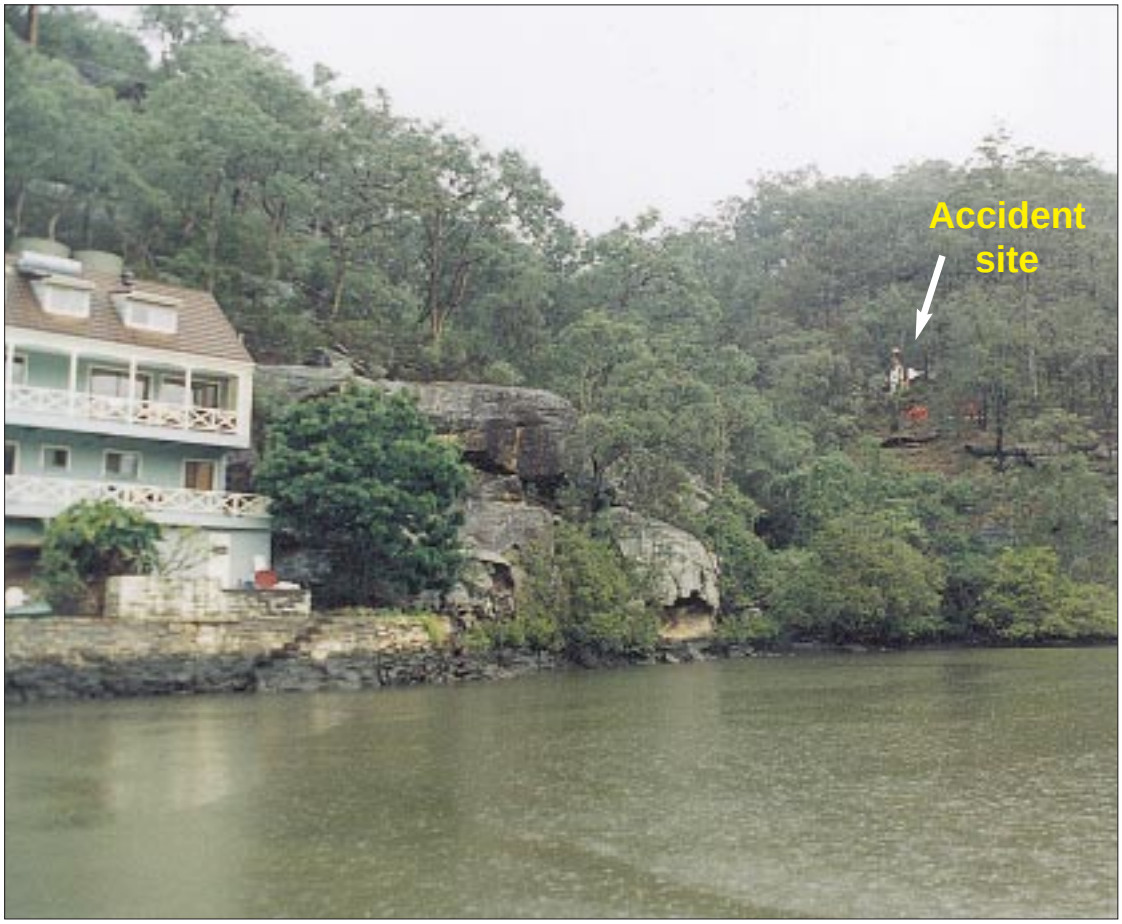
A Cessna A185E floatplane, VH-HTS, departed Palm Beach at 1309 on a visual flight rules charter flight to take four passengers to a waterside restaurant at Berowra Waters. The area was under the influence of a moist north-easterly airflow, producing widespread rain and showers, reduced visibility, and a cloud base of about 800 ft.

Various witnesses subsequently saw the aircraft flying low along the Hawkesbury River before commencing what appeared to be a downwind landing approach, in a south-westerly direction, along Berowra Creek. The aircraft descended to within about 30 ft of the water before climbing ahead towards the confines of Calabash Bay. Witnesses described the aircraft climbing over the middle of the bay to a height level with an adjacent ridgeline, about 300 ft above the water. The aircraft then initially banked to the right before entering a turn to the left at a bank angle of about 45°. A witness reported that the aircraft appeared to encounter turbulence during the turn. The wings were seen to rock before the aircraft disappeared from sight. Other witnesses in the area heard the aircraft engine, apparently operating normally, followed by the sound of a ground impact.

Calabash Bay as viewed by witnesses observing the aircraft from Deep Bay

The aircraft crashed at about 1324 into heavily timbered sloping terrain, on the ridge forming the southern shore of Calabash Bay. All five occupants suffered fatal injuries.

The accident site as viewed from Calabash Bay



1.2 Injuries to persons

	Crew	Passengers	Other	Total
Fatal	1	4	—	5

1.3 Damage to aircraft

The aircraft was destroyed by ground impact forces.

1.4 Other damage

No other property damage was reported.

1.5 Pilot in command

Licence category:	Commercial
Medical certificate:	Class 1
Total hours:	1,269
Total on floatplanes:	562
Total on type:	53.7
Total last 90 days:	75.1
Total on type last 90 days:	38.8
Total last 30 days:	30.3
Total on type last 30 days:	17.2
Total last 24 hours:	2.6
Last check:	5 July 1998
Last check on type:	9 April 1998

1.5.1 Pilot training and operational experience

The pilot had obtained a private pilot licence in 1979 and a commercial licence in 1981. He gained a single-engine instrument rating in 1983, which he maintained for most of the time until 1993. Up to that time he had accrued 704 flying hours, including 526 hours as pilot in command. He did not fly again until 28 June 1997, then completed a biennial flight review on 6 July 1997.

During July 1997 the pilot completed a 'float alighting gear' endorsement on the Maule M7 aircraft. This training totalled 7.9 hours and was conducted by two approved South Pacific Seaplanes company pilots. The pilot continued to fly the Maule M7 as pilot in command under supervision until the end of August. That was in order to meet a company requirement of 50 hours in-command-under-supervision experience before being able to commence charter operations. Some of that experience was gained on positioning flights, with the remainder being paid for by the pilot.

Although the pilot subsequently met the 50-hour requirement, the chief pilot at the time had some doubts as to his suitability to conduct commercial floatplane operations. It was decided that the pilot should undertake further in-command-under-supervision flying, resulting in an additional 16.3 hours, including 1.2 hours as pilot in command.

On 12 September 1997, the chief pilot made the following entry in the pilot's check and training file:

> '50 hours completed and flies to safe standard. May fly to Cronulla, Palm Beach, and Rose Bay in winds not in excess of 10 kts; Cottage Point, Peats Bight, Pasadena, Akuna Bay in winds not in excess of 10 kts with another company aircraft'.

On 17 September, the senior pilot made a further entry:

> 'Has been rostered on to fly as company line pilot. May fly into Cronulla, Rose Bay, Palm Beach, Cottage Point, Pasadena, and Peats Bight in winds not exceeding 15 kts'.

The pilot commenced charter operations in Maule M7 aircraft on 18 September. On 5 February 1998, the chief pilot converted the pilot onto the Cessna 185 aircraft. That training comprised 0.4 hours of basic handling, low-level flying, landings and moderate turns. On 9 April, the pilot underwent a company check flight of 0.9 hours, after which he flew the Cessna 185 regularly on charter flights. A 6-monthly check on the Maule M7 was carried out on 11 April, followed by a line check on 5 July. No problems were noted. Both check flights were conducted as pilot in command under supervision, while positioning to pick up fare-paying passengers.

According to his logbook, the pilot flew into Berowra once during his in-command-under-supervision training. The supervisory pilot on that flight reported that he would not have been conducting any check or training. He could not recall the approach method used, but stated that the approach must have been straightforward, otherwise he would have conducted it himself. The pilot flew into Berowra at least twice as a passenger during his in-command-under-supervision training. The pilots in command of those flights could not recall what approach methods were used.

The pilot first flew solo into Berowra on 5 October 1997. At that time South Pacific Seaplanes did not have a chief pilot. Between 5 October and 11 October charter operations were conducted under an Air Operators Certificate issued to Air Pioneer, a Townsville-based operator. The process used to assess the pilot's proficiency to fly into Berowra could not be determined, and there were no entries in the pilot's check-and-training file authorising operations at Berowra. Logbook entries indicated that the pilot had flown into Berowra on 47 occasions prior to the accident flight. Other company pilots, including the chief pilot, were unaware of the approach methods used by the pilot at Berowra. His last eight flights into Berowra were his only flights there in the Cessna 185. Four of those flights carried passengers. On each of these occasions he approached from the north-east and landed to the south-west.

1.5.2 Pilot performance

Company pilots who flew with the pilot reported that he had good aircraft handling skills and appeared to be competent. No one reported noticing anything unusual in his flying behaviour. Most pilots reported that they had not flown with him enough to comment on his aviation decision-making ability. It was also reported that the pilot had experienced some difficulties in adapting to floatplane operations, particularly when assessing the effects of weather on water surface conditions, and when using appropriate water handling techniques.

On 27 November 1997, the pilot was involved in a landing accident at Rose Bay, involving a Maule M7. The aircraft was on a positioning flight from Palm Beach to Cronulla. Arriving in the Cronulla area, the pilot found the weather conditions were too severe to permit a landing approach and diverted to Rose Bay until conditions improved. At Rose Bay the pilot commenced an approach to land in a north-easterly direction, directly into wind. Just before touchdown, the aircraft yawed sharply to the right. The left wingtip struck the water and the aircraft cartwheeled, coming to rest inverted. The pilot escaped with minor injuries. A significant factor in that accident was that there had been a sudden wind-shift during the final stages of the landing approach, with little or no warning to the pilot. The wind-shift was possibly associated with thunderstorm activity in the Sydney area.

On 12 December 1997, the pilot was involved in a taxiing incident at Rose Bay when his aircraft, a Maule M7, collided at low speed with a catamaran. The collision reportedly resulted in minor damage to the left wing of the Maule, and some minor scratching to a guardrail on the catamaran. The pilot had seen the catamaran on his left side and believed it would give way. The captain of the catamaran did not see the floatplane until just before the collision.

On 15 January 1998, the pilot was also involved in a taxiing incident at Cronulla. While re-positioning a Maule M7, he failed to stop the aircraft in time. The resulting collision with a dock caused minor damage to one of the floats.

1.5.3 Other pilot information

The pilot was employed by South Pacific Seaplanes on a casual basis, generally flying 2 or 3 days a week, and paid an hourly rate for hours flown. He also worked as a salesman 3 to 4 days a week.

During the 3 days prior to the accident the pilot was reported to have slept and eaten normally. His only flying during that period had been 1.9 hours on 24 July. On the day before the accident he relaxed and did various odd jobs. After waking at 0600 the next morning, he had breakfast, then reported for work at about 0730.

On the day of the accident the pilot's first flight commenced at about 0830. He carried out three positioning and three passenger flights before the accident flight. Passengers, and other people who talked to the pilot during the day, reported nothing unusual in his behaviour.

No evidence was found to indicate the pilot was experiencing any personal or medical problems that may have adversely affected his performance.

1.6 Aircraft information

1.6.1 Aircraft data

Manufacturer:	Cessna Aircraft Corporation
Model:	Cessna A185E
Serial Number:	185-01835
Registration:	VH-HTS
Country of manufacture:	USA
Date of manufacture:	1971
Imported from Canada:	1986
Float Alighting Gear:	Pee Kay Model C 3500
Certificate of Registration Holder:	Outback Air Pty Ltd, trading as Wilderness Air
No:	MBN 00489/01
Issued:	26 August 1986
	Note: At the time of the accident the Certificate of Registration had not been transferred, although the aircraft had been sold to South Pacific Seaplanes.
Certificate of Airworthiness:	
No:	MB 489
Issued:	14 August 1987
Maintenance release:	
No:	265168
Issued:	23 May 1998
Valid to:	23 May 1999 or 7,492.13 hours (whichever occurred first)
Total airframe hours:	7,486.5
Allowable take-off weight:	1,519 kg (floatplane variant)
Estimated take-off weight:	1,424 kg
Estimated weight at occurrence:	1,411 kg
Allowable centre of gravity limits:	1,028 mm to 1,181 mm aft of datum
Centre of gravity at occurrence:	1,163 mm aft of datum

1.6.2 Engine and propeller

Engine manufacturer:	Teledyne Continental
Model:	IO-520F
Propeller manufacturer:	McCauley
Model:	D3A32C 90/82NC-2 (3-blade, constant speed)

1.6.3 Weight and balance

Prior to the flight, the pilot had partially completed a company loading form, which showed the centre of gravity to be within permissible limits. However, although the aircraft basic weight and passenger weights had been recorded, the take-off weight had not been calculated. Subsequent estimates showed that the aircraft met weight and balance limitations for the accident flight, even though the actual fuel quantity could not be positively established.

The pilot's entry in the aircraft flight record indicated a fuel quantity of 144 L on departure from Palm Beach. An inspection of previous fuel records revealed inaccuracies when recording quantities. Although dipsticks were available to assist pilots to determine fuel tank contents, the investigation was unable to determine if the pilot had dipped the tanks prior to the flight.

1.6.4 Serviceability

The aircraft had been maintained in accordance with Civil Aviation Regulations Schedule 5, and approved variations to that schedule. A review of the aircraft maintenance data indicated that there was no maintenance outstanding at the time of the accident. The maintenance release was valid and contained an endorsement indicating that the 'suction' pump was unserviceable. The effect of this was to render the gyroscopic attitude indicator inoperative, which was labelled as unserviceable. The horizontal situation indicator was also labelled as unserviceable. Neither instrument was required for a charter flight conducted in accordance with the visual flight rules.

1.6.5 Climb performance

Civil Aviation Order section 20.7.4 specified the minimum aircraft climb gradients for takeoff, climb and landing climb (go-around). In order for the Cessna 185 floatplane to comply with climb gradient requirements the aircraft flight manual supplement for the Pee Kay C 3500 Floats limited the maximum allowable weight for take-off and landing to 1,519 kg.

The manufacturer's Pilot Operating Handbook for the floatplane variant stated:

> 'If an obstruction ahead requires a steep climb angle, a best angle-of-climb speed should be used with flaps up and maximum continuous power. This speed is 68 kt at sea level'.

The speed quoted in the company's copy of the Owners Manual (landplane) for this aircraft was 75 kts.

Climb performance for the Cessna 185E floatplane variant was published in the Pilot Operating Handbook. The only data given in tabular format was for maximum rates of climb. The calculated maximum rate of climb for the ambient conditions was 985 ft/min, 115 ft/min less than the equivalent climb performance of the landplane version.

South Pacific Seaplanes did not possess a copy of the Cessna 185E Pilot Operating Handbook (floatplane). The only climb performance information available to South Pacific Seaplanes' flight crew was from a copy of the Cessna 185F Owners Manual (landplane) held by the operator.

1.6.6 Turning performance

The minimum turning radius of the aircraft in still air with flaps up, at an angle of bank of 45˚, and an airspeed of 75 kts, was calculated to be 153 m. The pilot had an area about 500 m wide in which to manoeuvre within Calabash Bay.

1.7 Meteorological information

1.7.1 Weather forecasts

The company practice was to obtain briefing information by facsimile from Airservices Australia each morning. That information included weather forecasts for meteorological areas 20 and 21, as well as terminal forecasts for Bankstown, Sydney, Williamtown and Wollongong. The accident flight was conducted within area 20. Airservices Australia records confirmed that briefing information was transmitted to the operator at 0744 on 26 July 1998. A copy of that material was subsequently located in the company office at Cronulla.

The synoptic situation was reflected in the area 20 forecast, which indicated that the area was affected by a moist north-easterly airflow, producing widespread rain and showers over the greater Sydney and central coastal regions, with associated areas of low cloud and reduced visibility.

An amended area 20 forecast was issued for the period 0300-1500, indicating the wind at 2,000 ft was 050˚ at 25 kts, with scattered stratus at 300 ft and scattered cumulus and strato-cumulus at 2,000 ft, to sea and about the coast. There were forecast areas of broken stratus at 2,500 ft east of the ranges, and areas of broken alto-cumulus and alto-stratus above 7,000 ft. Visibility was expected to be reduced to 3,000 m in drizzle and rain, and 4,000 m in showers.

1.7.2 Specialist weather analysis

An analysis by the Bureau of Meteorology estimated the actual weather conditions in the Calabash Bay area at 1325, were: a wind at 1,000 ft of 030˚ at 25 kts, scattered stratus at 300 ft, broken to overcast stratus at 800 ft, and cumulus and layered cloud above the low stratus. Visibility was 6,000 m reduced to 3,000 m in intermittent rain and showers. Temperature was 13ºC, dewpoint 12.5ºC, with a relative humidity of 97%. QNH was 1,016 hPa.

1.7.3 Observed weather conditions

Accounts of the weather at Calabash Bay, by two helicopter pilots at the scene within 30 minutes of the accident, were generally consistent with the assessment provided by the Bureau of Meteorology. There were some heavy showers in the area, and continuous light drizzle. Visibility was described as good in some areas, but less than 2,000 m in heavy showers. There were patches of low cloud and scud on some of the hilltops. Ground witnesses reported that the hilltops in the Calabash Bay area were clear of cloud at the time of the accident.

Surface wind in the vicinity of the Berowra alighting area was estimated by observers as 050˚ at 15 kts, gusting to 25 kts. The wind below the hilltops was gusting, and windshear was considered to have been significant. Turbulence was assessed as moderate to severe. It was also considered likely that mechanical turbulence would have been present in the Calabash Point area, due to the steep sloping terrain to windward.

1.7.4 Visual flight rules

The pilot was required to comply with the visual flight rules for the intended flight. Civil Aviation Regulation 172 (1) requires the pilot of an aircraft flying at a height of less than 2,000 ft to be able to navigate by reference to the ground or water. When flying at a height below 3,000 ft, or within 1,000 ft of terrain, the provisions of Aeronautical Information Publication (RAC-8) require the pilot to be able to remain clear of cloud, with a minimum flight visibility of 5 km. Civil Aviation Regulation 174 (1) also states that flight visibility shall be determined by the pilot in command from the cockpit of the aircraft while in flight.

1.8 Aids to navigation

Not considered relevant to the investigation.

1.9 Communications

The aircraft was fitted with two VHF communications systems appropriate for the flight being undertaken.

The flight from Palm Beach to Berowra was conducted entirely in 'G' airspace, requiring no mandatory broadcasts. However, floatplane operators had agreed, in the interests of safety, to broadcast an inbound call on the area frequency of 125.8 MHz, approaching the alighting area.

Another company pilot airborne at the time, heard the pilot report inbound to Berowra. He was unable to determine from that transmission what type of approach the pilot intended making, or the landing direction to be used. An automatic voice recording of the area frequency did not capture that transmission. However, terrain shielding of radio transmissions is reported to be a common occurrence for aircraft operating at low level in that area.

1.10 Aerodrome information

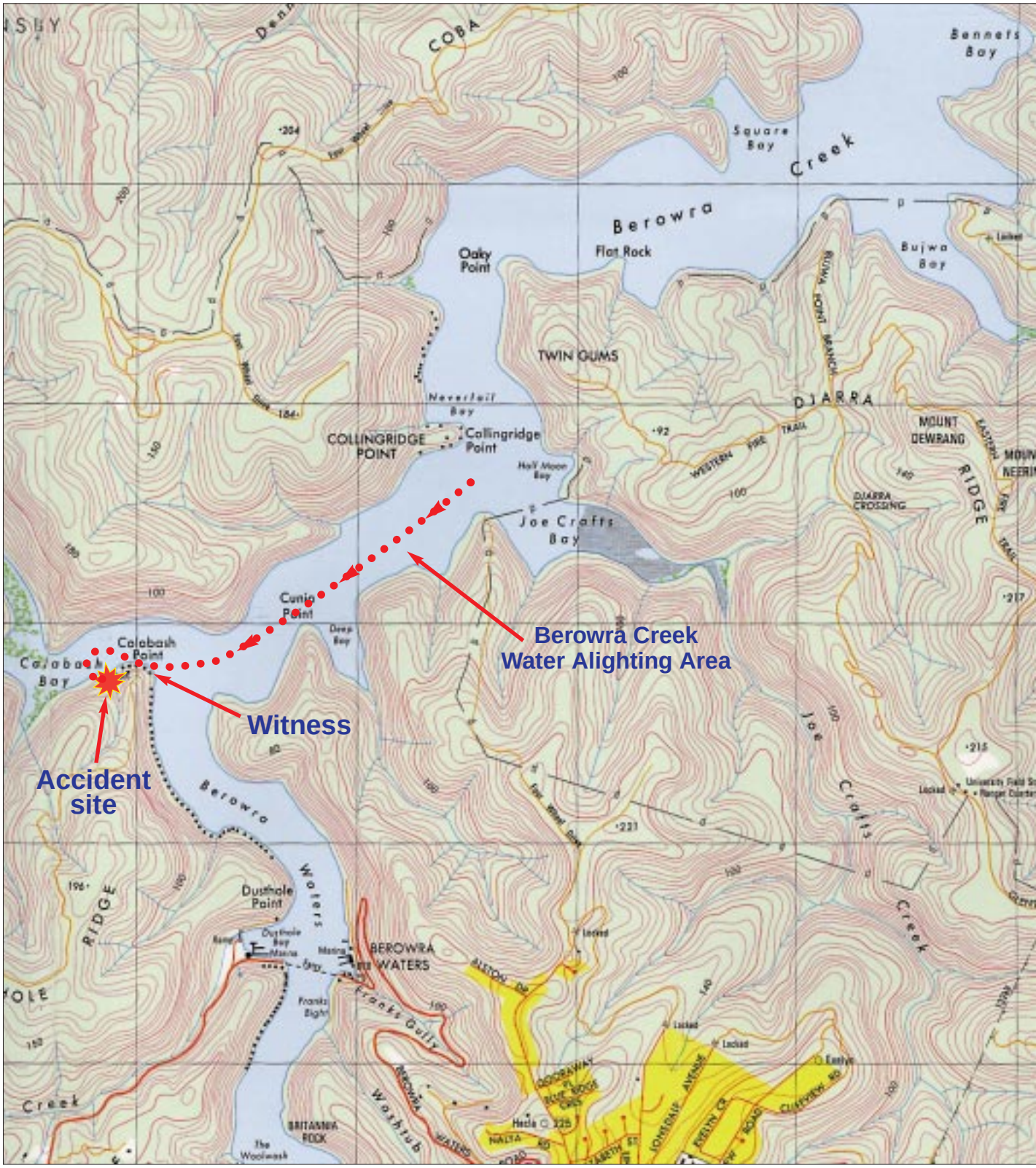
1.10.1 General description

The Berowra water alighting area was located at Cunio Point Reach on Berowra Creek, where the waterway was approximately 200 m wide and 2,000 m long. It was aligned north-east/south-west and bordered by tree covered terrain rising steeply to elevations of between 400 ft and 600 ft. At the north-eastern end the creek changed direction to the north, at Collingridge Point. At the south-western end of Cunio Point Reach is Calabash Point, where the creek forks. The southern arm of the fork turns 90° to the south-east and gradually narrows to become Berowra Waters. The western arm becomes the entrance to Calabash Bay. A powerline spanned the entrance to the bay at a minimum elevation of about 80 ft.

The water alighting area at Berowra is not controlled by air traffic services. The pilot of an aircraft using the alighting area is required to make an assessment about the suitability of the area before landing or taking off. Civil Aviation Regulation 92 (1) states (in part) that:

> 'An aircraft shall not land at, or take-off from, any place unless:
>
> (d) the place (not being a place referred to in paragraph (a), (b) or (c)) is suitable for use as an aerodrome for the purposes of the landing and taking-off of aircraft;
>
> and, having regard to all the circumstances of the proposed landing or take-off (including the prevailing weather conditions), the aircraft can land at, or take-off from, the place in safety'.

Civil Aviation Regulation 92 (1) did not specify the method of determining what 'circumstances', other than the prevailing weather conditions, should be considered in any particular case. Those matters are the responsibility of the pilot in command and, in some circumstances, are shared with the aircraft operator.



1.10.2 Advisory information

Civil Aviation Advisory Publication (CAAP) 92-1(1) provided guidelines for aircraft landing areas, including water alighting areas used by aircraft engaged in charter operations. Those guidelines recommended the minimum physical characteristics of a water alighting area, and factors that should be considered prior to using an area. The introduction to the CAAP contained the following passages:

> 'The information contained in this publication is advisory only. There is no legal requirement to observe the details set out in this publication'.
>
> 'These guidelines set out factors that may be used to determine the suitability of a place for the landing and taking-off of aeroplanes. Experience has shown that, in most cases, application of these guidelines will enable a take-off or landing to be completed safely, provided that the pilot in command:
>
> (a) has sound piloting skills; and
>
> (b) displays sound airmanship'.

The water alighting area at Berowra met the minimum physical dimensions published in CAAP 92-1(1). Although those dimensions provided for obstacle-free gradients for approach, takeoff and initial climb, the obstacle-free areas only extended 900 m beyond the anticipated point of touchdown or liftoff. There was no provision in the CAAP to provide for terrain clearance beyond the obstacle free areas, or a circling area as required for a licensed aerodrome.

Terrain surrounding the alighting area precluded circling safely below about 1,000 ft. Therefore, an aircraft taking off or going-around from a baulked landing approach, in either direction, would have had to climb to that altitude by following the watercourse.

1.11 Flight recorders

The aircraft was not equipped with a flight data recorder or cockpit voice recorder, nor were they required by regulation

1.12 Wreckage and impact information

1.12.1 Accident site description

The aircraft had impacted nose-down in a near vertical attitude, into steeply sloping, heavily timbered terrain, at an elevation of about 120 ft. Both floats had collided with a large boulder and been driven rearwards, with the right float striking the right horizontal stabiliser. Both outboard wing sections were severely disrupted as the aircraft descended through trees. The right outboard wing restrained the aircraft in its final resting position.


VH-HTS


VH-HTS

1.12.2 Technical examination of the wreckage

After a preliminary on-site examination, the wreckage was moved to a holding facility for further investigation.

1.12.2.1 Structure

The aircraft damage was consistent with a relatively low-speed, near-vertical impact with the ground. The engine and firewall had been driven rearwards, and the wings and supporting structure had moved forward and down until almost contacting the glareshield. The propeller was torn off in the impact. All extremities of the aircraft were found at the accident site, consistent with the aircraft being intact at the point of initial contact with trees. A considerable quantity of fuel remained in the ruptured fuel tanks, which continued to leak for about 24 hours after the accident. Both floats were torn and buckled rearwards to their respective steps, and the supporting struts were buckled and bent.

1.12.2.2 Flight controls

No evidence was found of any pre-existing defect or malfunction of any part of the flight control system. Single flight controls were fitted to the left control position. The left horn of the control wheel had separated. The elevator trim was found jammed about halfway towards the full nose-down position. That jamming was due to fuselage crushing at the underfloor sprocket bracket, aft of the trim wheel. When the crushed area was straightened the system functioned normally. The wing flaps were fully retracted. The engine and propeller controls had been severely disrupted and their respective settings could not be determined. The ignition key was broken off and the ignition switch was positioned at BOTH. The master switch was on. The air-activated stall warning horn functioned normally when tested.

1.12.2.3 Engine and propeller

The engine was dismantled for further examination. No evidence was found of any pre-existing defect or malfunction of the internal components. Both magnetos had separated from the accessory case during the impact sequence. The magnetos, complete with ignition system wiring and sparkplugs, functioned normally when tested. A maintenance release endorsement, dated 21 June 1998, stated that the '*suction*' pump was unserviceable. When the pump was removed from the case, the drive coupling was found to have been sheared. On dismantling the pump, the internal carbon vanes were found shattered and jammed.

The propeller internal blade-lock mechanism was damaged and the blades could be rotated in the hub. Leading edge damage and bending of the propeller blades was consistent with the propeller rotating under power at impact.

1.12.2.4 Fuel system

The fuel selector was selected to the left fuel tank. The engine fuel strainer was full of clear uncontaminated fuel, and the strainer was clear. There was a small amount of sediment in the strainer bowl. Clean fuel was found in the engine fuel distributor manifold. All recovered fuel samples were tested with water sensitive paste. No evidence of water was detected in any of the samples. All samples examined were consistent with aviation gasoline grade 100/130, the approved grade for the aircraft type.

1.12.2.5 Cockpit instruments

The cockpit instruments were severely damaged as a result of the impact, and no worthwhile calibration testing could be undertaken.

1.13 Medical and pathological information

There was no evidence found to indicate that the pilot suffered from any pre-existing condition that may have affected his capacity to function normally.

1.14 Fire

There was no evidence of any pre-impact or post-impact fire.

1.15 Survival

1.15.1 Crew and passenger restraint

The aircraft cabin contained six seating positions, in two rows of dual seats and a rear two-place bench seat. The pilot and front seat passenger seats were fitted with both lap and shoulder restraints. The remaining four passenger seats were fitted with lap belts only. Four of the five occupants died immediately on impact. A passenger occupying the left rear bench seat died at the scene shortly after. The right rear bench seat was unoccupied.

During the impact sequence, the pilot and front seat passenger lap belts remained fastened. However, neither was wearing their respective shoulder restraint. The second row, left seat outboard seat-belt stitching had failed at the belt tang. The tang was locked in the buckle and the right belt was intact. The right seat belt was unlocked and the right outboard belt anchor point had been torn from the aircraft structure as a result of overload failure.

The second row inboard seat belts were attached to the floor structure using a single attachment point instead of individual attachments. Moreover, that improper attachment did not use either of the two attachment points fitted to the aircraft structure by the manufacturer.

The left seat belt of the rear bench seat was fastened; however, the inboard belt anchor bolt had failed in overload. The investigation found that the anchor bolt was not the correct part. Metallurgical examination found that although the bolt was of lower strength than the correct part, its strength was sufficient to meet the aircraft design specifications.

A specialist post-mortem examination of the pattern of injuries sustained by the occupants suggested that the failure of the lap restraints in the middle and rear seat rows would have allowed the occupants of those seats to be projected forward, onto the seats in front. This cascade effect could have been initiated by the failure of the rear seat-belt mounting, consequently contributing to the progressive loadings on the seats and occupants in front. The type and severity of injuries sustained suggested that, had adequate lap and upper body restraint been fitted and worn, those features would have aided survivability. There was no regulatory requirement for the fitment of upper body restraints to other than the front row of seats.

1.15.2 Emergency locator transmitter

An emergency locator transmitter (ELT) mounting bracket and fixed antenna were installed in the rear of the aircraft behind the cabin area. However, there was no ELT fitted, nor was the aircraft required to carry one for the intended flight.

1.16 Tests and research

Not relevant to the investigation.

1.17 South Pacific Seaplanes organisation and management

1.17.1 Air Operator Certificate holder responsibilities

In accordance with the provisions of section 28BE of the Civil Aviation Act 1988:

> '(1) The holder of an AOC must at all times take all reasonable steps to ensure that every activity covered by the AOC, and everything done in connection with such activity, is done with a reasonable degree of care and diligence.
>
> '(2) If the holder is a body having legal personality, each of its directors must also take the steps specified in subsection (1).
>
> '(3) It is evidence of a failure by a body and its directors to comply with this section if an act covered by this section is done without a reasonable degree of care and diligence mainly because of:
>
> (a) inadequate corporate management, control or supervision of the conduct of any of the body's directors, servants or agents; or
>
> (b) failure to provide adequate systems for communicating relevant information to relevant people in the body'.

Section 28BD of the Act states that:

> 'The holder of an AOC must comply with all requirements of this Act, the regulations and the Civil Aviation Orders that apply to the holder'.

1.17.2 Company overview

The main purpose of the company was to conduct charter flights utilising small floatplanes, to cater for small groups of people wanting to sightsee, travel to restaurants located on waterways in the Sydney area, or pursue other similar activities. The Maule M7 aircraft was initially selected because of its performance, its ability to operate in confined areas, and its relatively low operating costs. The company catered for a niche market, and had proven popular with people requiring that type of service. Later, following an accident involving a Maule, a Cessna 185E was added to the aircraft types operated by the company.

Since the company had commenced operations in the middle of 1994 it had been beset by a number of safety related occurrences, as well as a series of complaints from a rival organisation, and from disaffected former South Pacific Seaplanes employees. A summary of these events, and the responses to them, is described in subsection 1.22.

1.17.3 Organisational structure

Aquatic Air Pty Ltd was a proprietary company trading as South Pacific Seaplanes, ACN 066328292, with a paid up share value of $2.00. The company was registered on 5 September 1994. Its directors were a married couple who, although having considerable experience in other commercial ventures, had no previous commercial aviation experience. One was appointed as Managing Director and Air Operators Certificate holder, while the other was appointed secretary. The Managing Director said that he had owned an aircraft for the previous 7–8 years, and that he held a private pilot licence.

A chief pilot supervised the company flight operations. Apart from the chief pilot, two pilots were employed on a full time basis. The pilot involved in the accident was employed on a casual basis. All four pilots commenced flying for South Pacific Seaplanes between July and September 1997. None had previous floatplane experience. The company also employed two office staff to assist with bookings and other administrative functions.

The main operational base was located at Cronulla, with additional facilities at Rose Bay and Palm Beach.

1.17.4 Financial fitness

There was no evidence found to indicate that financial problems may have had any significant adverse effect on the operation of the company.

During a CASA safety audit in April 1998 the audit team requested a financial profile as part of a business report on the company, from a service provider. That report indicated the company financial risk ratings were at about the industry average. However, the South Pacific Seaplanes Managing Director declined to release additional information to the service provider unless he knew who was making the inquiry.

1.17.5 Relationship with CASA

During the 4 years since South Pacific Seaplanes had commenced operating, the conduct of flying operations carried out by that company had been characterised by a series of safety related events, as described in subsection 1.22. Those events triggered various responses from CASA, including formal counselling of a chief pilot, a safety audit, two proposals to suspend chief pilot approvals, two proposals to suspend or cancel the South Pacific Seaplanes Air Operators Certificate, and a Notice of Suspension of the South Pacific Seaplanes Air Operators Certificate. The Air Operators Certificate was subsequently suspended, pending cancellation, following the accident on 26 July 1998.

When South Pacific Seaplanes first applied for an Air Operators Certificate the company had provided a commercially produced operations manual adapted for their operation. Although that manual was amended to reflect company seaplane operations, perceived deficiencies in the operations manual by CASA became a continuing problem for South Pacific Seaplanes. The Managing Director said that in hindsight, the original manual was not suitable for seaplane operations and if he had to do it again (produce an operations manual) he would write his own.

Since the commencement of South Pacific Seaplanes operations, the Managing Director had gained the impression that the assigned flying operations inspector had been biased towards a rival organisation, and had been obstructionist. He had raised this issue with both the former and current regional managers. But, because the district office did not have another float-qualified flying operations inspector, he was told the assigned flying operations inspector would continue to oversee both organisations. The Managing Director said that he saw the role of the assigned flying operations inspector as being the link between the industry and the regulator. However, throughout the history of the company the relationship with the regulator had deteriorated to the extent that they were not on speaking terms. The Managing Director thought that if they had been on speaking terms then things would have been different. He had been told by the assigned flying operations inspector that CASA was not a teacher, and that they looked for compliant operators.

The Managing Director explained that when the company had commenced operations everyone had been on a steep learning curve. He believed that if CASA had visited the company every 3–6 months, in those early days, then the end result would have been better for all concerned. The Managing Director felt that the current approach by CASA in not getting too close to operators was not a good way to foster relationships with the industry. He felt they (CASA) needed to get back into the old way of liaison with the industry, on an informal basis, to improve things. He also made the point that when applying for the initial issue of the Air Operators Certificate he had not been interviewed to assess his competency, nor had he been provided with any guidance material on what was expected of him in carrying out his responsibilities as an Air Operators Certificate holder.

The Managing Director indicated that another problem had been the high turnover of chief pilots. He felt that his first chief pilot had been very professional, however, there had been a falling out, resulting in his resignation. That person subsequently made a series of written complaints to CASA about South Pacific Seaplanes operations (see subsection 1.22). Considerable difficulties were experienced in obtaining pilots suitable for chief pilot approval. The Managing Director said he had problems with the next two chief pilots. Both left the company as a result of their deteriorating relationships with management. The next chief pilot agreed to act in that position for the time it took to arrange for someone else to take over, as he was taking up a position overseas. When he finally left, his replacement, who had no previous floatplane experience, had still not been approved by CASA. While that experience was being obtained, the Managing Director said that he was able to continue operations under the Air Operators Certificate of two other operators. Finally, on 16 October 1997 the current chief pilot was appointed. The Managing Director expressed a high regard for this person, and considered that if he had been the chief pilot from the outset, things would have been different.

1.18 South Pacific Seaplanes flight operations

1.18.1 Operations manual

Civil Aviation Regulation 215 required an operator to provide an operations manual for the use and guidance of the operations personnel of the operator.

When South Pacific Seaplanes initially applied for the issue of an Air Operators Certificate a 'generic' type operations manual, purchased from a commercial supplier, was submitted for approval. The assigned flying operations inspector subsequently recommended that the operations manual be revised, prior to the issue of the Air Operators Certificate, to cover aspects related to water operations, including authorised alighting areas.

Deficiencies in the operations manual became a continuing problem for both South Pacific Seaplanes and CASA, resulting in a number of revisions. One ongoing concern related to the authorised landing area register not providing sufficient detail regarding alighting area dimensions, obstacles, and approach and climb gradients. At no time did the operations manual contain procedures and guidelines to inform flight crew how company aircraft should be operated at specific locations.

In September 1997, CASA produced CAAP 215-1(0), Guide to the Preparation of Operations Manuals. The purpose of the CAAP was defined in the preamble to that document, and included the following statement:

> 'This publication provides the operator with a standardised framework within which to present that information essential to the conduct of his operations. While compliance with this CAAP is not mandatory, standardisation provides benefits to the operator in terms of ease of compilation and speed of assessment by CASA, and provides a readily recognisable document for use by operations personnel'.

The introduction to the CAAP included the following:

> 'An operations manual (OM or alternatively 'the manual') is provided by an operator for the use and guidance of the operations personnel of the operator. It [the operations manual] shall contain such information, procedures and instructions with respect to the flight operations of all types of aircraft operated by the operator as are necessary to ensure the safe conduct of flight operations (CAR 215 (2)).
>
> 'As part of its methodology for the safety regulation of industry, CASA will place increasing emphasis on operators to use safety systems in the oversight of their operations. An operations manual itself is a safety system and it will contain many sub-systems'.

The CAAP also provided a sample manual. Within that manual various sections were described. Section A6.13 provided for 'Operations at selected locations'.

As a result of a safety audit conducted by CASA officers on 21–23 April 1998, a number of non-compliance notices were issued to South Pacific Seaplanes, two of which related to deficiencies in the company operations manual. At the time of that audit the South Pacific Seaplanes operations manual did not contain specific guidance for operations at selected locations. The non-compliance notices issued did not address that deficiency. Amendment 9 to the South Pacific Seaplanes operations manual was issued on 30 April 1998 in response to the non-compliance notices, and a copy provided to CASA on 8 May 1998. That amendment also made no reference to operations at specific locations, nor did it contain a section A6.13.

In order to comply with condition 4 of a 'stay' order issued by the Administrative Appeals Tribunal on 21 May 1998 (see subsection 1.22, Summary of Significant Events), a new operations manual was produced, effective from 1 June 1998, and submitted to CASA on 5 June 1998. The format of the manual followed the guidelines of CAAP 215-1(0). Section A6.13 of the new operations manual ('Operations at Specific Locations') was listed as Reserved.

As a result, at the time of the accident, there were no published procedures to provide guidance to South Pacific Seaplanes flight crew when operating into specific locations such as Berowra.

1.18.2 Flight crew perceptions

During the course of the investigation, a number of pilots were interviewed who were either working for, or had worked for, South Pacific Seaplanes.

Some commented that although the two directors of the company had limited experience with regard to floatplane operations, both had a continuing influence on operational decisions, often due to commercial imperatives. Almost all pilots indicated that the close scheduling of flights was a continuing problem. Some felt there was pressure exerted to overload aircraft, particularly when carrying four people in the Maule M7. Others commented that pressure was exerted to continue flying operations despite adverse weather conditions. The Managing Director encouraged a 'give it a go' attitude.

A former company pilot made the observation that there appeared to have been three phases during the period that South Pacific Seaplanes had been operating. The first phase coincided with the term of the first chief pilot, who was well regarded, and 'babied' the company through the initial setting up period. The next phase was an interim period, during which a number of key personnel left the company, resulting in a loss of operational experience. The third phase commenced with the employment of the current chief pilot.

A former chief pilot said that he had experienced hostility and ongoing pressures from the Managing Director and his wife when he tried to take action on safety matters, such as overloading. On one occasion he and two other pilots were told by the Managing Director that if they did not fly overloaded they would not have a business. He also stated that the company directors were largely unaware of operational issues, and thought that they had a lot of power but no operational responsibility. He also indicated that South Pacific Seaplanes was one of the busiest little charter firms in Australia, and could have benefited from better management.

Two pilots employed by South Pacific Seaplanes at the time of the accident indicated that they had no problems with the company. Both got on well with the current chief pilot, and felt that pilots were able to have an input into company procedures. One indicated that the chief pilot appeared to be more safety conscious than most charter pilots, probably because of his instructional background. Company employees enjoyed a good rapport compared to earlier times when there had been trouble with staff.

1.18.3 Operations at Berowra

The majority of pilots interviewed during the course of the investigation regarded Berowra as being a very difficult, if not the most difficult, alighting area used by South Pacific Seaplanes. Wind and weather appeared to be the main considerations when deciding on the suitability of Berowra. Wind funnelling was described as a real problem, particularly with wind speeds in excess of 10–12 kts. A former chief pilot said that approaches to Berowra had to be carefully planned, even in light winds, because the alighting area was almost a one-way strip.

During the interviews it became apparent that there were no standard methods or procedures used by company pilots when operating at Berowra. This was evidenced by a number of past and present company pilots who described how they would make a landing approach to the north-east. They said they would approach the area from the north, descending in a reversal turn over Calabash Bay, before passing over the ruins of a building on Calabash Point as the aircraft was established on final approach. Others stated that they always made the approach by flying north over Berowra Waters before turning right to land in Berowra Creek. The current chief pilot reported that he had never flown over Calabash Bay when landing to the north-east, nor had he seen other floatplanes approach in that way.

Pilots reported that they would generally try to take off to the north-east, even accepting a downwind component, rather than try to climb out to the south-west. Landings to the south-west were preferred in order to minimise taxiing times. The general consensus was that a downwind component of less than 10 kts could be accepted for a landing to the south-west, if other conditions were suitable. If a missed approach needed to be carried out in that direction, most pilots agreed that turning left and climbing along Berowra Creek was the only option.

It also became evident that each pilot had different views about decision points, flying techniques, the conduct of missed approaches, and other operational procedures. Most pilots indicated that there was no stigma attached to making a missed approach.

One very experienced pilot said he did not think he could have turned a Cessna 185 in Calabash Bay, whereas he could have done so with the Maule M7. Other pilots, including the current chief pilot, said they would not have attempted to fly into Calabash Bay on a missed approach.

1.18.4 Floatplane operations

All of the pilots interviewed stated that floatplane operations were significantly different to landplane operations. They indicated that such things as decision points and approach procedures were difficult to define for their operations, due to the various factors that could affect the landing areas. In essence, they believed that their operations had to rely almost solely on pilot judgement rather than formally defined procedures or guidelines. This pilot 'judgement' appeared to refer to a series of general guidelines or decision rules for landing areas, that were meant to be explained to new pilots during their training and in-command-under-supervision phases. When the last four pilots commenced operations with the company, a lack of experienced floatplane pilots meant that this knowledge was not passed on as well as it might have been.

1.18.5 Cessna 185 conversion training and checking

Training records showed that some conversion training on the Cessna 185 floatplane had been provided to company pilots. That conversion training consisted mainly of takeoffs and landings, and water handling. The Cessna 185 was not equipped with dual controls. Not one pilot interviewed recalled ever having attempted stall recovery, maximum rate turns, or go-around manoeuvres, either during conversion training or on subsequent proficiency checks. Only one pilot could recall practising steep turns.

Although the operations manual contained a checklist for sequences in a 6-monthly check, it did not include manoeuvres such as steep turns, or go-arounds. None of the company pilots converted to the Cessna 185 had exceeded 40 minutes of in-command-under-supervision training. Nor could any of the pilots interviewed recall carrying out a go-around in the Cessna 185. The cockpit checklist provided by South Pacific Seaplanes did not include the aircraft manufacturer's procedures for a 'Baulked Landing' (go-around).

Subsection 40.1.0.4.3 of the Civil Aviation Orders (Authority Given By Class Endorsement) provided the following:

> 'NOTE 1: The holder of a class endorsement should not act as pilot in command of any aeroplane included in the class on any flight unless he or she is familiar with the systems, the normal and emergency flight manoeuvres and aircraft performance, the flight planning procedures, the weight and balance requirements and the practical application of take-off and landing performance charts of the aeroplane to be flown and has sufficient recent experience or training in the aeroplane type, or in a comparable type, to safely complete the proposed flight.
>
> 'NOTE 2: The owner and the operator of a type of aeroplane included in a class of aeroplane should ensure that any person who proposes to fly as a pilot in command of the aeroplane complies with the requirements set out in Note 1 and should, where necessary, require the pilot to provide evidence of recent experience or training in the aeroplane type, or in a comparable aeroplane type'.

Pilots described the difference between the Cessna 185 and the Maule M7 to be quite marked, in both handling and performance. The Cessna was described as being 'heavy' on the controls and having a 'solid feel'. It demanded of the pilot a greater physical and mental input, which was attributed to a combination of higher control forces and aircraft performance. Its longer take-off run than the Maule's, and its poorer climb performance, required much more thought and planning. Pilots reported they became more fatigued flying the Cessna than they did flying the Maule.

1.18.6 Airworthiness

The relatively small Maule M7, in particular, was adversely affected by continued operations in saltwater and environmental conditions for which it probably had not been designed. That resulted in ongoing airworthiness problems for the company. However, the Managing Director believed that part of the problem was that CASA staff were generally critical about floatplanes, because they did not understand the environment in which they operated. Aircraft operated in saltwater were bound to develop rust streaks and to sustain more severe weathering, but this was part of normal operations.

The Managing Director said he was aware that the aircraft needed almost constant maintenance because of the operating environment. However, because the maintenance facilities were located at Bankstown, it meant that company aircraft had to be flown to the adjacent Georges River and transported on a trolley to the maintenance facility at the airport. As a result, minor repairs were difficult to attend to. The Managing Director indicated that CASA had also been critical of the decisions made by pilots when assessing damage and defects on company aircraft. Because of the nature of floatplane operations, small dents and other minor damage were almost daily occurrences. He said that staff would assess the damage to determine if an aircraft could continue to be flown. He agreed that there were generally no entries placed on the maintenance release to this effect, and that CASA had identified that deficiency in an audit. The Managing Director believed this situation would be addressed by South Pacific Seaplanes having its own maintenance facility.

At the time of the accident, the Managing Director had taken steps to employ a full-time engineer at the Cronulla base, and to gain CASA approval to carry out maintenance on company aircraft.

1.19 CASA air operator certification procedures

1.19.1 Introduction

Section 9 (1) of the Civil Aviation Act 1988 stated:

> 'CASA has the function of conducting the safety regulation of the following, in accordance with this Act and the regulations:
>
> (a) civil air operations in Australian territory;
>
> (b) the operation of Australian aircraft outside Australian territory'.

1.19.2 Aviation Safety Compliance Branch structure

Pending implementation of the new CASA organisational structure in July 1998, the structure of CASA prior to 30 June 1998 was comprised of the following;

- The Office of the Director, administered by an Acting Director Aviation Safety, who in turn reported to the CASA Board.
- Fifteen branches, including the Aviation Safety Compliance Branch, each administered by a general manager reporting to the Acting Director.
- The Acting General Manager, Aviation Safety Compliance Branch, was responsible for coordinating entry-control and surveillance functions, developing appropriate processes for centralised management of key aspects of those functions, as well as other compliance and enforcement related activities. Branch accountability for those functions was facilitated at the field level through three regional managers who reported directly to the Acting General Manager.

The Acting General Manager stated that he had a staff of two flying operations inspectors and one technical officer to assist him, and felt that this was insufficient to adequately oversee the actions of regional managers. He was provided with delegations similar to those held by regional managers, but no superior delegations.

- The role of the regional office was to provide the most efficient means of ensuring industry compliance with aviation regulatory standards, and providing regulatory services. The regional manager was responsible for the performance of district offices within the regional boundaries. District flying operations managers and district airworthiness managers reported directly to the regional manager.
- The function of the Office of Legal Counsel was to provide assistance to the Board, the Director, and staff on legal issues involving the operation of CASA. This included providing legal advice on regulatory functions, and assistance in the preparation of regulatory documents such as show-cause letters. In addition the office was responsible for managing Administrative Appeals Tribunal appeals, and other legal issues involving CASA.

1.19.3 Initial issue of an Air Operators Certificate

In accordance with the provisions of section 9 (1) of the Civil Aviation Act 1988 CASA has a number of defined functions. For the purposes of its functions CASA may issue Air Operators Certificates (s27 (1) *Civil Aviation Act (1988))*. Division 2 of the Civil Aviation Regulations lists certain requirements to ensure the safety of commercial operations.

An operator is defined in Civil Aviation Regulation 212 as a person who engages in commercial operations. Commercial operations are defined in Civil Aviation Regulation 2. Air service operations for Commercial Purposes are defined in Civil Aviation Regulation 206, including charter purposes (206(1) (b)). Aquatic Air Pty Ltd trading as South Pacific Seaplanes held an Air Operators Certificate (BK535224-07) authorising charter operations, at the time VH-HTS was involved in the accident at Calabash Bay on 26 July 1998.

Procedures to be followed by CASA personnel, prior to the issue of an Air Operators Certificate, were described in the Air Operators Certification Manual. Prior to the existence of that manual, the applicable CASA document was the Manual of Air Operator Certification. That document was the governing internal manual when South Pacific Seaplanes first applied for an Air Operators Certificate.

1.19.4 Subsequent issue of an Air Operators Certificate

Procedures for the re-issue of an Air Operators Certificate were contained within chapter 1.3 of volume 1 of the Air Operators Certification Manual. There was no provision within the Civil Aviation Act for an existing Air Operators Certificate to be renewed, to have the validity period extended, or to renew an expired Air Operators Certificate. The Act contains a provision whereby the production of new manuals is not required for the re-issue of an existing Air Operators Certificate. However CASA could request the applicant to produce manuals if required.

1.19.5 Compliance statement

On 8 May 1997, the district flying operations manager wrote to the then chief pilot of South Pacific Seaplanes indicating that the term 'renewing' an Air Operators Certificate was no longer used in legislation so there would be a need for all operators to provide a 'Compliance Statement' when applying for the issue of an Air Operators Certificate. It was explained that this was necessary to assist an operator in achieving regulatory compliance, and to enable CASA to verify that compliance. An applicant would need to have in place, or develop, specific procedures to achieve compliance. Such procedures must be included in the operations manual. The letter also stated:

> 'You will appreciate that in this post Monarch and Seaview era, satisfactory completion of the Compliance Statement is a pre-requisite for re-issue of your AOC'.

On the evidence available, no Compliance Statement was ever produced by South Pacific Seaplanes prior to Air Operators Certificate re-issue. Yet, prior to February 1998, the Air Operators Certification Manual (appendix 4 checklist, Operations Manual, volume 2, version 2.0, May 1997) required the operations manual to be first checked against the Compliance Statement for completeness and acceptability, before conducting further checks of the manual.

1.19.6 Limits on the issue of an Air Operators Certificate

Section 28 (1) of the Act stated (in part) that if a person applied to CASA for an Air Operators Certificate, CASA must issue the Air Operators Certificate if, and only if:

> '(a) CASA is satisfied that the applicant has complied with, or is capable of complying with, the provisions of this Act, the regulations and the Civil Aviation Orders, that relate to safety, including provisions about the competence of persons to do anything that would be covered by the Air Operators Certificate…'

Paragraph 2.3.1 (2) of the Air Operators Certification Manual, volume 1, states (in part):

'The delegate must be either satisfied as to the matters contained in Section 28, or not. Similarly, an operator either complies or does not. Under the Act, a delegate must not issue an AOC for a limited period solely to give an errant operator time to meet requirements.'

(The delegate in this instance was the district flying operations manager.)

1.19.7 Air Operators Certificate cancellation action

According to information provided by the CASA Office of Legal Counsel, during the period 1 July 1996 to 31 July 1998 there were two Air Operators Certificates cancelled by CASA. The CASA Annual Report of 1996-97 indicated the total number of Air Operators Certificates in Australia was 910 (not including foreign aircraft Air Operator Certificates).

1.19.8 Operations manuals

CASA required an applicant for an Air Operators Certificate to lodge certain manuals, including an operations manual (s27AB (2) (a) Civil Aviation Act (1988)). Civil Aviation Regulation 215 requires that an operations manual be provided to the operations personnel of the operator for their use and guidance. When an applicant for an Air Operators Certificate lodged a copy of the operations manual, CASA laid down certain actions that were to be undertaken in respect of that manual, during the process of approving the application of the Air Operators Certificate. Those actions were set out in the Air Operators Certification Manual.

Prior to 1 October 1998, Civil Aviation Order 82.0 (Air Operators Certificates, Application for Certificates and General Requirements) contained references to the operations manual. Subsection 3.3 of that Order required that an applicant for a certificate must (in part) 'provide to the Authority for its approval an operations manual'…

The Air Operators Certification Manual also defined the phases through which the application for the Air Operators Certificate must pass. Activities within the phases were defined. The document evaluation phase contained the following definition:

'…involves the detailed study of company manuals, for example, the operations manual…'.

Many of the references to the operations manual in the Air Operators Certification Manual were ambiguous. The operations manual was either, 'assessed', 'approved', 'accepted', 'evaluated', 'checked' or 'reviewed', depending upon which section was read and what checklist was applied.

1.19.9 Chief pilot approvals – general

Civil Aviation Order 82.1 (issue 2, 3 October 1990) required that an operator establish a position of chief pilot and appoint a person to that position. Appendix 1 to Civil Aviation Order 82.0 (issue 2, 3 October 1990) required that a person not be appointed to the position of chief pilot unless that person's appointment had been approved in writing by CASA.

CASA was required to take into consideration several matters before approving a chief pilot. These matters were listed in part 5 to appendix 1 of Civil Aviation Order 82.0. The applicant was required to be assessed by CASA as being suitable; pass an oral examination covering the regulatory requirements; and pass a flight planning, loading and performance examination on the most complex aircraft operated by the operator. In addition to the above, an applicant could be required to undergo a flight test to demonstrate their suitability to hold the position.

CASA was required to issue an approval for the person to hold the position and this approval could contain certain conditions. The approval could be given for a period of time or where no time period was specified, and be subject to the person maintaining a satisfactory level of performance. The approval related specifically to the operator nominated in the notice of

approval. The approval could be cancelled or suspended at any time if, in the opinion of CASA, the performance of the chief pilot was no longer of an acceptable standard.

Unless otherwise approved by CASA, the chief pilot was required to hold at least the minimum qualifications listed in table A to appendix 1 of Civil Aviation Order 82.0.

1.19.10 Chief pilot approvals – South Pacific Seaplanes

In the case of South Pacific Seaplanes the applicable experience requirements for chief pilot approval were;

- a minimum of 500 hours total flight time on relevant aircraft types;
- 9 months experience in commercial operations; and
- full-time employment of the chief pilot by the operator.

At the time that South Pacific Seaplanes first obtained an Air Operators Certificate it was only operating one aircraft, so the requirements were less (300 hours on relevant aircraft and 6 months commercial experience).

From the commencement of operations until the accident, the company had employed a total of five chief pilots. Moreover, an examination of relevant documents indicated that most of them had limited experience in floatplane operations at the time of approval. Only one applicant had previous experience as a chief pilot. Two chief pilots were approved, subject to being supported by an experienced senior pilot acceptable to CASA.

1.20 CASA compliance and enforcement procedures

1.20.1 Overview

In accordance with the provisions of section 9 (1) of the Civil Aviation Act 1988, CASA had the function to develop effective enforcement strategies to secure compliance with aviation safety standards.

The policy and procedures under which CASA (and the then CAA) was required to carry out its compliance and enforcement responsibilities were found in CASA's Compliance and Enforcement Manual, which was first issued in February 1995. That manual defines the distinction between compliance and enforcement:

> 'Compliance includes voluntary adherence by the aviation industry to the regulatory requirements and activities conducted by the Civil Aviation Authority involving education and counselling…
>
> 'Enforcement action may take several different forms, including suspension, variation or cancellation of licences, authorities or certificates, and prosecution.
>
> 'Officers should generally use enforcement action as a last resort, unless it is obvious that a deliberate breach of the Act or Regulation has occurred. Normally, officers should adopt a graded compliance path to achieve adherence to regulatory requirements, in the first instance involving education and counselling. It is only when these actions are unsuccessful, or a serious or blatant breach of safety requirements occurs, that stronger deterrent action should be considered'.

The regional manager was provided with the delegation (Instrument Number CASA 244/97) to exercise powers relating to Air Operators Certificates.

Officers were required to have regard to the general guidance and information contained in the Compliance and Enforcement Manual, and were required to be able to justify their decisions.

1.20.2 Compliance and enforcement methods

Chapter 4 of the manual outlined the methods to be used by CASA to ensure that safety regulation was carried out. The methods available to CASA to achieve voluntary compliance included education and counselling. The manual explained in general terms the purpose of education and counselling. Officers were reminded that they should provide whatever educational assistance was necessary to promote compliance. Informal counselling was to be used to explain a non-compliance and to obtain an undertaking that further contraventions of the safety regulations would not occur. Such counselling should generally only be used where a person had committed a minor, inadvertent contravention. It also suggested that the counselling be recorded on file.

It was recommended that formal counselling be used where a contravention, while not serious enough to warrant administrative action, was nevertheless serious enough to be formally recorded in a person's file.

Where voluntary compliance could not be achieved the Compliance and Enforcement Manual detailed several enforcement methods that could be used to ensure adherence to the aviation safety rules. These include the power to vary, suspend or cancel licences, certificates and authorities. In addition, as contraventions of the ACT and the regulations constitute offences against Commonwealth law, they may need to be referred to the Director of Public Prosecutions for consideration.

Part 5.3 of the manual detailed the matters that were to be considered when making enforcement decisions:

> 'In determining which of the enforcement tools is the most appropriate in a particular case a delegate must consider all relevant matters, including:
>
> - All the facts and circumstances of the case
> - The availability of reliable evidence
> - Any precedents
> - The person's history of compliance'.

The checklist contained within that section was to be used by the delegate to arrive at the correct decision. In addition, categories of operation were ranked. Officers were advised that the higher the category of operation the more serious the contravention. The second highest category listed was charter (passenger). Only regular public transport was listed higher.

1.20.3 Informal conference procedures

Section 31 (3) of the Civil Aviation Act 1988 provided that any person whose interests were affected by a 'reviewable decision' may apply to the Administrative Appeals Tribunal for a review of that decision.

New procedures incorporated into the Compliance and Enforcement Manual in May 1996 provided the option for an informal conference to be offered to those effected by decisions. That procedure was designed to:

> 'provide persons affected by licence or certificate action with an opportunity to explain, clarify and expand upon the facts and circumstances giving rise to the action, and, in appropriate cases, provide an opportunity for the delegate and the person affected by the delegate's decision to formulate the terms of an undertaking, in accordance with which the person agrees to take certain remedial or corrective actions, acceptable to the delegate, which may satisfy the delegate that there is no need to vary, suspend or cancel the person's licence or certificates'.

The information sheet sent with a Notice of Proposed Action (Show Cause Notice) to an affected person contained, in part, the following:

> 'On the basis of these informal discussions, the responses contained within your written response to the Show Cause Notice (if any), and such other considerations as the delegate may properly take into account, the delegate may ask if you are willing to agree to take certain specified remedial or corrective actions. If you agree to do so, your agreement will be reduced to a written undertaking to be signed by you and placed on your file'.

1.20.4 Graduated response policy

The final report of the Commission of Inquiry into the relations between the CAA and Seaview Air contained several recommendations. Recommendation 7 dealt with the term 'graduated response' and how in the Commission's opinion, that concept had outlived its usefulness. It suggested a change to the enforcement policy for the following reasons:

> 'The Commission repeatedly observed situations in which the operator was asked for information or assurances, that were then accepted without either investigation or follow-up. That was the approach even when the operator had a clear motive to conceal or misrepresent the truth. Such an absence of skepticism fosters in operators contempt for the regulatory authority'.

Recommendation 8 of the same Commission was:

> 'The Authority [CAA], through training and instruction of its officers, place greater emphasis on thorough investigation. Information must be checked for its veracity and accuracy. Assurances should be followed up'.

1.21 CASA surveillance procedures

1.21.1 Aviation Safety Surveillance Program

The Aviation Safety Surveillance Program had been developed to undertake the surveillance functions set out in section 9(1)(f) of the Civil Aviation Act. The program was a surveillance strategy designed to provide an assessment of the aviation industry's safety level, identify regulatory non-compliances, and evaluate industry's responses to correcting identified non-compliance. The Aviation Safety Surveillance Program was a part of CASA's quality management system, and allowed CASA to plan surveillance in a systematic manner. The priorities assigned to the planning and implementation of the program were as follows:

- activities affecting the safety of the travelling public;
- organisations or individuals with known indications of higher risk;
- scheduled surveillance; and
- unscheduled activities.

The information gathered during surveillance activities was used to allow CASA to follow up industry compliance matters with appropriate corrective measures. These measures range from education and counselling through to enforcement, involving administrative action or prosecution.

The responsibility for planning surveillance activities was undertaken by the relevant district/section managers. In accordance with the provisions of the Aviation Surveillance Safety Program manual, the normal frequency for a periodic flying operations inspection of a non-scheduled charter operator was once every 18 months. The frequency of airworthiness periodic inspections for the same category of operator was once every 24 months. Although there were

only two periodic flying operations inspections during the course of South Pacific Seaplanes operations, there were a number of unscheduled inspections as a response to complaints or reports received.

1.21.2 Non-compliance notices and aircraft survey reports

A non-compliance notice formed part of the Aviation Safety Surveillance Program and could be issued by CASA whenever a non-compliance with the regulations or orders had been detected. This could be the result of a scheduled surveillance inspection, unscheduled inspection, or any other time that a non-compliance was brought to the attention of either an airworthiness inspector or flying operations inspector. The non-compliance notice form itself had no legal head of power, but was used by CASA to record the number and type of non-compliance. Non-compliance notices were graded in severity from 1 down to 5 for system deficiencies in commercial organisations/operators, with 1 being a non-compliance relating to domestic passenger carrying operations, placing safety at risk. Where a non-compliance related to the airworthiness of an aircraft, an aircraft survey report was issued.

When a non-compliance notice was issued, the operator received a copy referring to the regulation(s) or order(s) not complied with. The notice also detailed how the operator had not complied, and provided a section within which the operator was required to indicate the corrective action taken to rectify the situation. That section was then returned to CASA by the response due date indicated on the form. The inspector who issued the non-compliance notice retained a copy, and a further copy was placed on the operator's file for future reference. A final copy was sent to an administrative section in the district office where information from the non-compliance notice was incorporated into the applicable surveillance control document, before being entered onto the Aviation Safety Surveillance Program database.

If the non-compliance notice had not been satisfactorily acquitted by the response due date, the administrative officer in the Aviation Safety Surveillance Program section of the district office contacted the responsible inspector and determined whether a follow-up letter should be sent to the operator.

Volume 1 page 5-21 of the Aviation Safety Surveillance Program manual indicated that a non-compliance notice was taken to be acquitted once the corrective action slip was completed and returned to CASA. The non-compliance notice could be acquitted on receipt of other confirmation considered suitable by the inspector, and recorded on file.

1.21.3 South Pacific Seaplanes surveillance reports

There were a total of 21 non-compliance notices and two class A aircraft survey reports issued to South Pacific Seaplanes, based on information provided to the investigation team. Of the non-compliance notices, two were grade 1, eight were grade 2, eight were grade 3 and two were grade 5. One non-compliance notice was not graded. Of the nine non-compliance notices issued as part of a safety audit on 21–23 April 1998 (see 1.22), five had not been acquitted on the Aviation Safety Surveillance Program database by mid-October 1998. The assigned airworthiness inspector who issued the notices advised the investigation team that the reason for their non-acquittal was that the responses provided by the operator were unsatisfactory, and that the measures outlined on the acquittal slips had not been completed.

The remaining four non-compliance notices were issued by a flying operations inspector and have been acquitted on the Aviation Safety Surveillance Program database. In an e-mail to the leader of the CASA audit team, the inspector advised that the proposed actions indicated on the acquittal forms of three of the non-compliance notices would be satisfactory; however, those actions had not been assessed by 8 May 1998. By mid-October 1998 no evidence had been found to indicate that an assessment was carried out. The proposed action on the fourth

non-compliance notice (inclusion of Cessna 185 procedures in the operations manual) was apparently complied with by the issue of a new operations manual on 1 June 1998. However, there was no evidence that the operations manual itself was assessed by CASA prior to the accident on 26 July 1998.

1.22 Summary of significant events

The following is a chronological summary of significant events relating to the operation of South Pacific Seaplanes during the period 26 June 1994 to 29 July 1998. This information has been primarily obtained from an examination of company and CASA documents, together with interviews of key personnel.

26/6/94 South Pacific Seaplanes applied for an Air Operators Certificate to permit single engine floatplane charter operations in the Sydney area.

12/9/94 The district flying operations manager issued Air Operators Certificate BK431538-01 to South Pacific Seaplanes to permit charter and aerial work operations in Maule M7 floatplanes. The Air Operators Certificate to remain in force until 31 August 1995.

7/2/95 A complaint was received by the assigned flying operations inspector regarding the operation of South Pacific Seaplanes Maule VH-AEL at Berowra in hazardous wind conditions on 3 February 1995.

18/4/95 The assigned flying operations inspector issued a non-compliance notice after finding damage to the elevator of South Pacific Seaplanes Maule VH-AEL that had not been entered onto the maintenance release for rectification. The aircraft had continued to be operated on charter operations. The elevator was subsequently removed by the chief pilot for repair. The chief pilot was formally counselled by CASA officers on 12 May 1995.

23/6/95 South Pacific Seaplanes Maule VH-AEL was observed by CASA officers to be apparently operated in a dangerous manner at Rose Bay. During a subsequent meeting at Bankstown on 5 July 1995 the chief pilot raised the issue of aircraft having to turn at heights below 500 ft after takeoff, and to conduct a landing from a final approach leg of less than 500 m, due to constraints imposed by the physical characteristics of some alighting areas being used by South Pacific Seaplanes.

4/7/95 An undated hand written record was placed on the CASA flying operations file concerning compliance of the operations manual with the Civil Aviation Regulations and Orders. The record appeared to have been made on or about 4 July 1995 by the assigned flying operations inspector. One item referred to section A6.13, (Operations at Specific Locations). Another, section A1.16, refered to a company ALA register. There was also a reference that authorised landing areas were to meet the recommendations of the CAAP.

31/7/95 The chief pilot was issued with a 'show cause' letter from the district flying operations manager concerning the proposed cancellation of his chief pilot approval. This action was taken with regard to the events of 18 April 1995 and 23 June 1995.

1/8/95 The assigned flying operations inspector advised the chief pilot that South Pacific Seaplanes operations into certain alighting areas were contrary to the South Pacific Seaplanes operations manual and Civil Aviation Regulations 166, and were to cease immediately. The chief pilot was requested to amend the operations manual with proposed methods of operating into those alighting areas before any concession against the Civil Aviation Regulations could be considered.

7/8/95 An exemption from compliance with the provisions of Civil Aviation Regulations 166 (1) (d), (f) and (g) was issued to South Pacific Seaplanes by CASA.

31/8/95 The district flying operations manager advised the chief pilot that no further regulatory action would be taken with regard to his chief pilot approval, following due consideration of his response to the 'show cause' letter. He was also reminded of his responsibilities with regard to the Civil Aviation Act, Regulations and Orders.

31/8/95 Air Operators Certificate BK431538-02 was issued to South Pacific Seaplanes. To remain in force until 31 August 1996.

12/9/95 A periodic inspection of South Pacific Seaplanes was carried out by the assigned flying operations inspector, who made a recommendation that the frequency of inspections be increased.

26/2/96 A surveillance inspection and ramp check were carried out at the South Pacific Seaplanes Cronulla base. Concerns were expressed by the assigned flying operations inspector regarding, aircraft flying low over Cronulla during approach and landing, and the ALA register not containing sufficient detail regarding dimensions, obstacles and climb gradients. The flying operations inspector recommended to the district flying operations manager that the company be directed to operate their aircraft over water at all times when flying below 1,000 ft over a populated area. A Civil Aviation Regulations 215(3) direction to include that procedure in the South Pacific Seaplanes operations manual was subsequently made on 17 April 1996. The flying operations inspector also recommended that the frequency of inspections be increased.

17/4/96 A new Air Operators Certificate BK535224-01 was issued to reflect a change to the company legal entity. To remain in force until 31 August 1996.

18/4/96 The chief pilot of South Pacific Seaplanes complained to the CASA Deputy Director Aviation Safety that a directive issued on 17 April 1996 regarding flight over water below 1,000 ft was too restrictive.

13/5/96 A meeting was held at Bankstown to discuss the flight over water directive. In attendance were the assigned flying operations inspector and the CASA officer who issued the directive, as well as the South Pacific Seaplanes chief pilot, Managing Director, and a representative from the Waterways Authority.

16/5/96 Following the Bankstown meeting the South Pacific Seaplanes chief pilot wrote to the deputy director of aviation safety alleging that the assigned flying operations inspector had

> 'consistently obstructed our companies [sic] progress and operations by creating problems and having us re-write and re-word our Operations manual no less than five (5) times since August 94'.

20/5/96 The South Pacific Seaplanes chief pilot wrote to the district flying operations manager indicating that the regional manager had requested that the district flying operations manager be informed that South Pacific Seaplanes did not intend to answer any questions, or enter into any correspondence with the assigned flying operations inspector. In the meantime, the chief pilot stated that the Deputy Director Aviation Safety had confirmed that the directive issued on 17 April 1996, regarding flight over water below 1,000 ft was null and void.

28/5/96 The regional manager convened a meeting between all parties to the dispute regarding flight over water below 1,000 ft, including another seaplane operator. It was resolved that companies needed to consider amending their operations manual to address operations over major built up areas. The issue of complaints against the assigned flying operations inspector was to be addressed as a separate matter.

12/8/96 The district flying operations manager advised South Pacific Seaplanes that the allocation of work in a district office was a matter for the district flying operations manager, who had to make the best use of available resources. The assigned flying operations inspector would remain unchanged.

29/8/96 Air Operators Certificate BK535224-02 was issued. To remain in force until 31 August 1997.

11/11/96 The South Pacific Seaplanes Managing Director advised the district flying operations manager of the resignation of the chief pilot. The district flying operations manager advised that until CASA approved a new chief pilot, all operations authorised by Air Operators Certificate BK535224-02 must cease. Later, that day, the Managing Director advised that the chief pilot would remain in his present position.

18/11/96 The South Pacific Seaplanes chief pilot advised the Managing Director that he would be leaving the company on 18 December 1996. The district flying operations manager was advised and indicated that a suitable candidate for the position of chief pilot would need to be assessed prior to gaining approval.

29/11/96 An application for chief pilot approval was sent to the district flying operations manager.

12/12/96 The chief pilot applicant was assessed by a CASA flying operations inspector but was unsuccessful in meeting the knowledge and experience requirements to gain approval. On the following day another flying operations inspector suggested that the current chief pilot remain in that position for a further 2 weeks to enable the incoming chief pilot additional time to gain approval. That suggestion was rejected as the departing chief pilot would be some 2,000 km away from where South Pacific Seaplanes operated. However he subsequently advised the district flying operations manager that he would delay his departure until 2000 hours on 19 December 1996.

19/12/96 The incoming chief pilot reached a satisfactory standard with regard to the deficiencies identified on 12 December 1996. However, his flying experience in floatplanes was still less than that required by CASA. The flying operations inspector recommended that he be made chief pilot subject to a satisfactory resolution of the floatplane experience requirements.

23/12/96 The new chief pilot was formally approved by the district flying operations manager, following the appointment of an experienced floatplane pilot as his senior pilot.

24/12/96 The former South Pacific Seaplanes chief pilot complained to the Managing Director that South Pacific Seaplanes had conducted operations between 20 December 1996 and 22 December 1996 without a chief pilot.

26/12/96 A South Pacific Seaplanes Maule, VH-LRZ, overturned in strong winds at Rose Bay whilst taxiing. The pilot, who was the only occupant, escaped uninjured. The following day the chief pilot suspended flying operations for some hours.

27/12/96 The former South Pacific Seaplanes chief pilot, rang CASA and complained that South Pacific Seaplanes had conducted operations between 20 December 1996 and 22 December 1996 without a chief pilot.

18/2/97 As a result of a CAIR report submitted to BASI on 4 January 1997, CASA was advised that serious allegations had been made concerning the operation of South Pacific Seaplanes. Specific details from that report were included in the advice to CASA, in a de-identified form.

20/2/97 An unscheduled inspection of South Pacific Seaplanes was carried out at Palm Beach by the assigned flying operations inspector, accompanied by a senior airworthiness inspector. A number of deficiencies were found that resulted in four non-compliance notices being issued relating to the operation of South Pacific Seaplanes aircraft. Two aircraft survey reports were issued relating to the airworthiness of Maule VH-AGX. At the time of the inspection, that aircraft was being operated by the chief pilot on a passenger carrying flight.

21/2/97 Further allegations of unsafe operations relating to South Pacific Seaplanes were received by BASI in a CAIR report, and subsequently referred to CASA in a de-identified form. The CAIR manager was satisfied that the substance of the claims warranted further investigation. The

concerns related to the apparent lack of ability demonstrated by the pilot of a South Pacific Seaplanes Maule.

13/3/97 Following information passed to CASA from BASI (Sydney Field Office) on 13 March 1997, the regional manager requested that the district flying operations manager investigate allegations that South Pacific Seaplanes operated without an approved chief pilot, and recommended that, if true, the company be asked to show cause why their Air Operators Certificate should not be varied.

19/3/97 The former South Pacific Seaplanes chief pilot wrote to the Deputy Director Aviation Safety regarding the safety of South Pacific Seaplanes operations. He indicated that he still had some unresolved concerns with the company, which he had reported to the CASA Bankstown district office, and to CAIR, with no apparent result. He alleged that he had received complaints from company pilots concerning

> 'flying over-weight and out of balance, being forced to fly in conditions exceeding the capabilities of the Maule, exceeding flight and duty times each week and the lack of experience and control exercised by the Chief Pilot'.

The writer also alleged that the current chief pilot had telephoned him four times to complain of the same things, advising that

> 'he has no control over the operator, is forced to fly over-weight and is generally concerned about his ability to cope.'

He further claimed that the Managing Director South Pacific Seaplanes had called the district flying operations manager and advised that he (the former chief pilot) had agreed to remain on as chief pilot during the intervening 4 days in December 1996, until the new chief pilot had been approved. The former chief pilot denied there had been any such agreement.

24/3/97 The Deputy Director Aviation Safety wrote to the former chief pilot, regarding his letter of 19 March 1997, and advised that the regional manager would be asked to convene a full investigation of the matters raised.

6/4/97 As a result of investigations carried out by CASA into the allegations made by the former chief pilot, the regional manager issued a 'Notice of Proposed Action to Suspend or Cancel AOC', giving the Managing Director South Pacific Seaplanes 28 days to respond.

20/4/97 The Managing Director South Pacific Seaplanes responded in writing to the 'show cause' letter, providing a detailed response to the issues raised.

23/4/97 The then South Pacific Seaplanes chief pilot, in an operational memorandum to the Managing Director, wrote of his great concern regarding the 'Notice of Proposed Action to Suspend or Cancel AOC'. He went on to advise that action to address the matters raised must be taken in real terms.

The chief pilot then complained about the Managing Director's failure to address ongoing operational and maintenance problems voiced by current and past pilots. He stated:

> 'At two meetings you have simply scoffed when these issues are raised. We are told that this is the type of operation we provide and that by not turning a blind eye we demonstrate our disregard for the commercial imperatives driving South Pacific Seaplanes'.

He further wrote:

> 'I would suggest that to threaten your Chief Pilot with the sack and abruptly hang up on him after he sought operational advice from his predecessor, is hardly sound and effective management.

'Similarly the animosity and abuse I received for suspending operations on the day after the Boxing Day accident was absurdly counterproductive. You are right in saying that an 'us and them' relationship has developed. The Pilots and I have only sought to operate legally, safely and efficiently whilst your financial imperative has worked in complete opposition to these objectives'.

5/5/97 The chief pilot advised the Managing Director that he was giving 28 days notice of termination of his employment as chief pilot of South Pacific Seaplanes. He stated:

'You are aware of my ongoing concerns involving the operation outlined in my previous operational memorandum dated 23 April 97. You have not replied to this letter in writing and you have verbally informed me that you reject all my concerns.

'In my efforts to comply with the Acts, Regulations and Orders I have only encountered resistance from the operators of South Pacific.

'I have serious and continuing concerns about inadequate Aircraft maintenance, aircraft loading, unsafe scheduling demands and the standard of management'.

6/5/97 The chief pilot sent a notice of resignation to the assigned flying operations inspector, together with a copy of his resignation letter to the Managing Director.

7/5/97 The chief pilot sent a notice of resignation to the district flying operations manager, together with a copy of the operational memorandum issued on 23 April 1997.

7/5/97 The assigned flying operations inspector recommended that the regional manager, on the basis of safety concerns raised by the chief pilot of South Pacific Seaplanes, take immediate action by suspending the South Pacific Seaplanes Air Operators Certificate and requiring the chief pilot and Managing Director to address those issues by 9 May 1997. However, the regional manager explained that an Air Operators Certificate suspension would not be appropriate as a 'show cause' action was already in place.

9/5/97 The manager of the organisation responsible for the maintenance of Maule floatplanes operated by South Pacific Seaplanes notified CASA Airworthiness Branch at Bankstown that the organisation had ceased maintenance of the aircraft. The reason given was that

'In our professional opinion, these aircraft are unsuitable for this type of operation'.

The manager also stated:

'These aircraft are subject to very severe conditions and certainly should require ongoing maintenance on at least a daily basis to ensure airworthiness is maintained for safe flying conditions'.

10/5/97 The regional manager wrote to the Managing Director South Pacific Seaplanes to advise the outcome of an informal conference on 9 May 1997.

The regional manager stated, in part:

'As a result of the informal conference I would expect to see an improvement in the performance of your company with regard to its compliance with its obligations under the Civil Aviation Act and Regulations. I would also expect to see improved communications with the Bankstown District Office of the Authority with regard to the safety aspects of your operations. Having regard to the outcome of the informal conference, the Authority will not take any action to suspend or cancel your Air Operator's Certificate at this time'.

No written agreement was made with the operator regarding the events leading to the 'show cause' action, and the subsequent informal conference.

The South Pacific Seaplanes chief pilot left, and was replaced by a new chief pilot on 3 June 1997.

16/6/97 The South Pacific Seaplanes Managing Director advised the district flying operations manager that the newly appointed chief pilot was unsuitable and nominated a new candidate to be interviewed on 18 June 1997.

17/6/97 The chief pilot distributed South Pacific Seaplanes Flying Operations Bulletin (FOB) No. 5/1997, which addressed a number of operational safety issues. He stated that during the chief pilot approval interview with CASA many issues were discussed, particularly those deficiencies which led to the 'show cause' action. However, he indicated that a number of listed issues had been discussed with the Managing Director in the hope of 'quickly achieving legality or satisfying our duty of care'. He indicated that this approach had not worked. As chief pilot he was legally liable for any harm that might come as a result of this inaction; therefore no flight was authorised to commence if any listed matter had not been adequately attended to.

20/6/97 The chief pilot also produced South Pacific Seaplanes FOB No. 7/1997 which stated:

> 'The company Operations Manual A1.17, states that the pilot in command is to ensure that the alighting area is safe for all take off, landing and surface operations. He or she is also required to ensure that suitable overshoot and undershoot areas are available.
>
> 'We do not meet our legal obligations or duty of care to our passengers by operating to or from unsurveyed alighting areas. This is true regardless of the size of the areas because, in the event of a mishap, we may be required to quantify and prove the dimension.
>
> 'The CAAP contains recommended water alighting area dimensions, and approach and overshoot gradients.
>
> 'Company flights are only authorised to use waterways that meet or exceed the dimensions listed in the CAAP.
>
> 'There are no alighting areas listed in our ALA register (including Gunammata Bay) that have been surveyed or have been proven to meet these minimum dimensions.
>
> 'From 1630 Hrs, today, no flight is authorised to or from any alighting area that has not been surveyed and is proven to meet the minimum dimensions as specified in the CAAP'.

A copy of FOB No. 7/1997 was provided to the assigned flying operations inspector, and to the Minister for Transport and Regional Development.

21/6/97 A new chief pilot was appointed and issued FOB No. 8/1997, which cancelled FOB No. 7/1997, saying:

> 'I believe its intent was to harm SPS and its operations due to personal differences between Mr [the former chief pilot] and SPS.
>
> 'As stated in our Ops manual and FOB 5/1997 500 metres + 20% will be accepted Take-off and Landing distances required for all company ALA's
>
> 'As discussed with Mr [the assigned flying operations inspector] I have made it my responsibility to ensure the recommendations set out in CAAP are materialised into an official ALA register, for all company ALA's. As you can imagine this will take some hours to compile but I believe 15/8/1997 to be a sufficient deadline'.

A copy of FOB No. 8/1997 was provided to the assigned flying operations inspector.

25/6/97 The assigned flying operations inspector called a meeting with the new chief pilot to discuss the cancellation of FOB No. 7/1997, and the introduction of FOB No. 8/1997.

1/7/97 Another officer took over the duties of regional manager, a position he continued to hold at 26 July 1998.

18/7/97 The CASA Board received a report from the Board Safety Committee noting that South Pacific Seaplanes 'has a history of safety problems' and determined that due to the NCN's that had

been issued, the Minister, should give consideration to the publication of these in a serious deficiency summary.

6/8/97 The assigned flying operations inspector carried out a periodic inspection of South Pacific Seaplanes on 17 July 1997 prior to the issue of another Air Operators Certificate. As a result of that inspection a number of items requiring attention were identified, including the failure of the ALA register to address the obstacle clear gradient recommendations of CAAP 92-1 (0).

26/8/97 The South Pacific Seaplanes chief pilot advised the assigned flying operations inspector, who was also Acting District Flying Operations Manager, that he was relinquishing his position as chief pilot by no later than 16 August 1997 (subsequently extended to 23 September 1997).

27/8/97 The Deputy Chairman of the CASA Board received a letter from a former South Pacific Seaplanes chief pilot regarding the substandard management practices of South Pacific Seaplanes, 'as other submissions appear to have evoked no discernible improvements.'

The former chief pilot also stated in that letter:

> 'I feel it is somehow futile to document all of these conflicts over the period of my involvement with SPS since these have already been listed to CASA. I have a journal full of them and there are numerous non-compliance notices recorded against SPS. But as a final attempt to prevent another "Seaview" or "Monarch" occurring, I am hoping the board will be somehow able to help.
>
> 'The Bankstown office, although diligent in discharging surveillance duties seems unable to achieve any change in behaviour from the management of SPS. I was greatly concerned when as the Chief Pilot for SPS I was not invited to a 'show cause' [why the company's Air Operators Certificate should not be suspended] meeting between CASA and the [operators]. I considered my position and after legal advice resigned. I became even more alarmed when the [operators] emerged from this meeting thinking they had scored a victory over the regulator and it was business as usual.
>
> 'My greatest fear was that I would end up in the coroners court being held responsible for the deaths of members of the public which could have been avoided.
>
> 'I have since worked casually for SPS and have observed no improvement in the standard of operation. In fact I was told second hand that I would not be employed casually again, after last weekend, for entering unserviceable flaps on the maintenance release. To enter unserviceable faults in the maintenance release is regarded as being against the company spirit and taken personally by the management. With the fourth Chief Pilot in eight months now also considering resignation and inexperienced pilots being inducted I fear the worst'.

The Deputy Chairman of the CASA Board requested an urgent response to the letter. Copies were also sent by the former chief pilot to the CASA Board, and the Minister for Transport and Regional Development.

28/8/97 The Deputy Director Aviation Safety travelled to Sydney to arrange for an investigation of the matters raised in the letter to the Deputy Chairman.

29/8/97 The chief pilot advised the assigned flying operations inspector that new alighting area charts were being drawn with overshoot and undershoot areas depicted. Other items relating to an inspection on 17 July 1997 were also mentioned as being attended to.

29/8/97 South Pacific Seaplanes Air Operators Certificate No. BK535224-03 was issued for a period of 3 months to enable outstanding items to be incorporated in an action plan.

30/8/97 Another former South Pacific Seaplanes chief pilot wrote to the CASA General Manager Airworthiness, alleging that all three Maule aircraft operated by South Pacific Seaplanes had illegal, undersized, undercarriage struts and attachments, for operations at a maximum takeoff weight of 2,750 lb. He stated that the applicable weight for that configuration was 2,400 lb.

A subsequent investigation by airworthiness officers proved that allegation to be incorrect.

3/9/97 A report was raised by the Regional Manager as a result of the letter sent to the Deputy Chairman of the CASA Board on 27 August 1997, and the subsequent visit to Sydney by the Deputy Director Aviation Safety. A brief for the CASA Board was prepared based on the report.

22/9/97 The assigned flying operations inspector briefed the regional manager on the current status of South Pacific Seaplanes. The outstanding issues to be completed related to a lack of take-off/landing performance data in the aircraft flight manuals, and alighting area obstacle clear gradient information in the operations manual.

24/9/97 A proposed replacement chief pilot advised the assigned flying operations inspector that he no longer wished to be considered, and had resigned from the company. The South Pacific Seaplanes Managing Director nominated another chief pilot candidate, requesting approval with the utmost expediency. He also stated:

> 'the Company cannot operate at all until the appointment of a new Chief [Pilot]'.

27/9/97 The South Pacific Seaplanes Managing Director contacted the chief pilot of Great Lakes Seaplanes to arrange for South Pacific Seaplanes to continue operating under the Great Lakes Seaplanes Air Operators Certificate. The Great Lakes Seaplanes chief pilot contacted the CASA office at Coffs Harbour for advice, then conducted check flights with each South Pacific Seaplanes pilot, in addition to having all South Pacific Seaplanes pilots read and sign the Great Lakes Seaplanes operations manual. South Pacific Seaplanes operated under the Great Lakes Seaplanes Air Operators Certificate from 27 September 1997 to 3 October 1997.

5/10/97 The chief pilot of Air Pioneer agreed to permit South Pacific Seaplanes to operate under the Air Pioneer Air Operators Certificate, after being approached by South Pacific Seaplanes management. CASA was not informed. A copy of the Air Pioneer operations manual was sent to South Pacific Seaplanes for signing by the company pilots. All other arrangements were made by telephone. Air Pioneer did not currently operate seaplanes, nor was the Maule M7 type listed on the Air Pioneer Air Operators Certificate.

9/10/97 The Townsville district flying operations manager sent a facsimile to the chief pilot of Air Pioneer requesting confirmation that Air Pioneer was not conducting operations at any location where the crews had not been issued with a Civil Aviation Order 20.11 certificate (emergency procedures proficiency). The district flying operations manager also insisted that the operator cease all operations where a 20.11 certificate had not been issued. Evidence from the accident pilot's logbook indicated that South Pacific Seaplanes continued operations after 9 October 1997. That date was also listed in the CASA safety audit team report (21–23 April 1998) as being the last date of operations on the Air Pioneer Air Operators Certificate, yet no mention of subsequent operations without an Air Operators Certificate was made by the audit team, nor was there any mention of the Maule M7 not being listed on the Air Pioneer Air Operators Certificate.

10/10/97 At least one South Pacific Seaplanes pilot conducted a series of flights in the Sydney area in company Maule, VH-LRZ.

11/10/97 The chief pilot of Air Pioneer advised the Townsville district flying operations manager that the company was not conducting operations at any location where the crews had not been issued with a Civil Aviation Order 20.11 Certificate.

14/10/97 'Witness', a current affairs television program, reported safety concerns relating to South Pacific Seaplanes operations.

16/10/97 A new South Pacific Seaplanes chief pilot was appointed. That person continued to hold that position beyond the events of 26 July 1998.

21/11/97 In a brief to the CASA Board regarding South Pacific Seaplanes, the regional manager concluded:

> 'The AOC will expire on 30 November 1997 and an application for re-issue has been received. One of the matters that the company was required to rectify by 15 September is to update the company's register of 'Authorised Landing Areas (ALAs). This has not yet been done due to the turn-over of Chief Pilots and will be taken up with the company in the process of assessing the application for re-issue of the AOC.
>
> 'Since South Pacific Seaplanes re-commenced operations on or about 15 October there has been no information to suggest that the company is not compliant'.

25/11/97 The assigned flying operations inspector wrote to the South Pacific Seaplanes chief pilot requesting, as a matter of urgency, the status of changes to the ALA register.

27/11/97 A South Pacific Seaplanes Maule, VH-AEL, overturned in a landing accident at Rose Bay. At the time of the accident the area was affected by strong winds and thunderstorms. The pilot, who was the only occupant, was uninjured. A brief of the accident was sent to the CASA Board the following day.

28/11/97 South Pacific Seaplanes Air Operators Certificate No. BK535224-04 was issued for a period of 2 months.

29/11/97 The assigned flying operations inspector wrote to the South Pacific Seaplanes chief pilot requesting a report on the accident on 27 November 1997, addressing a number of listed issues. That request was repeated on 1 December 1997.

1/12/97 The regional manager provided the CASA Board Safety Committee with an updated brief on South Pacific Seaplanes.

2/12/97 The South Pacific Seaplanes chief pilot provided a report to the district flying operations manager that attributed the major factor in the accident to be strong winds associated with operating in close proximity to storm cells. He advised that an addition to the company operations manual would be made regarding flight in the proximity of storm cells.

2/12/97 The South Pacific Seaplanes Managing Director notified the assigned flying operations inspector that he intended to operate a Cessna 185E floatplane, VH-HTS:

> 'The aircraft will be operated in accordance with the requirements of the aircraft's Flight Manual, the aircraft's Operating Manual and the South Pacific Seaplanes Company Operations Manual'.

That application was subsequently processed by another flying operations inspector.

5/12/97 The Cessna A185E floatplane type was added to the South Pacific Seaplanes Air Operators Certificate, which was superseded by Air Operators Certificate No. BK535224-05. The South Pacific Seaplanes chief pilot was requested to ensure that operations were conducted only in accordance with the aeroplane flight manual and the pilot operating handbook, until the performance and planning parameters applicable to the Cessna 185 floatplane were incorporated in the company operations manual.

12/12/97 A South Pacific Seaplanes Maule, VH-AGX, was involved in a collision with a catamaran at Rose Bay, while taxiing for departure. There were no injuries. The pilot estimated the cost of damage to the seaplane to be $4,000. No report was provided to BASI. On 23 February 1998 Sydney Waterways issued a formal warning to the pilot as a result of the occurrence. The same pilot was subsequently involved in the accident on 26 July 1998.

12/1/98 The Chairman of the CASA Board Safety Committee wrote to the Chairman of the CASA Board regarding the issue of delegations for action against chief pilots and Air Operators Certificate holders. He expressed concern about the way in which recent action was taken

against another Air Operators Certificate holder. He believed that the delegations should be centralised as a matter of urgency and requested that the chairman instruct the Acting Director to provide the necessary delegation to the Acting General Manager of the aviation safety compliance branch, and the General Manager of the High Capacity Regular Public Transport Branch. He also requested that written guidance on the procedures to be followed regarding action against Air Operator Certificate holders and chief pilots be provided to all field and district offices.

14/1/98 The Chairman of the CASA Board wrote to the Acting Director Aviation Safety and asked him to arrange the necessary delegations for both general managers. He also instructed the Acting Director to prepare a document for field and district office managers, explaining the way actions against Air Operator Certificate holders and chief pilots were to be handled.

30/1/98 South Pacific Seaplanes Air Operators Certificate No. BK535224-06 was issued, to expire on 31 May 1999. The chief pilot was also approved to act as chief flying instructor of South Pacific Seaplanes, to permit floatplane endorsement training.

4/2/98 The assigned flying operations inspector met the chief pilot at the South Pacific Seaplanes base to discuss a proposed application to add a flying school licence to the South Pacific Seaplanes Air Operators Certificate.

27/2/98 Another flying operations inspector completed a 3-day evaluation of a float alighting gear course conducted by the chief pilot. A satisfactory assessment was given. The flying operations inspector flew a total of 5.6 hrs in Maule, VH-LRZ, during the 3 days.

23/3/98 The assigned flying operations inspector was advised by the chief pilot of another organisation that a South Pacific Seaplanes Maule, VH-LRZ, had been operating throughout the previous week with a known crack in one of the float attachment struts. This information was passed onto the Bankstown district airworthiness manager, who ordered an inspection of the aircraft.

24/3/98 An unscheduled inspection of VH-LRZ was conducted by the assigned senior airworthiness inspector, who reported that the float attachment strut had a crack approximately 2 inches [50 mm] in length through the bolt attach point. In addition, both lower rear fuselage longerons were found to be badly corroded and both pilot entry doors were unable to be opened externally. As a result of those defects, two class A aircraft survey reports were issued, together with one class B aircraft survey report.

The senior airworthiness inspector also reported that the South Pacific Seaplanes chief pilot had indicated to him that he was aware of the crack in the float strut and said 'I am monitoring it'. The senior airworthiness inspector commented that this particular defect could have had a catastrophic consequence if left unchecked. The chief pilot did not hold aircraft maintenance engineer qualifications.

Both the chief pilot and Managing Director were directed by the senior airworthiness inspector to enter the two class A defects in the aircraft maintenance release, and to report those major defects to CASA on the appropriate forms.

25/3/98 The South Pacific Seaplanes chief pilot was invited to attend a meeting at Bankstown on 1 April 1998 with the assigned flying operations inspector and assigned senior airworthiness inspector, to discuss the issues arising from the inspection on 24 March 1998.

26/3/98 The assigned senior airworthiness inspector conducted an unscheduled airworthiness inspection on South Pacific Seaplanes Maule, VH-AGX. He found splits in the fabric on the upper surface of the horizontal stabiliser, between 3 to 6 inches [75 mm to 150 mm] in length. He subsequently issued a non-compliance notice against the operator for failing to enter known defects in the maintenance releases for VH-AGX and VH-LRZ.

The results of that inspection were referred to the Bankstown district airworthiness manager, district flying operations manager and assigned flying operations inspector. The Bankstown district airworthiness manager also provided a safety report on South Pacific Seaplanes to the regional manager.

The assigned flying operations inspector recommended to the district flying operations manager that the South Pacific Seaplanes chief pilot approval be suspended, stating:

> 'Continued operation by this company with Mr […] as Chief Pilot poses a serious threat to the safety of fare paying passengers and the general public. The seriousness of these matters negates the conduct of the counselling process'.

He went on to state:

> 'This recommendation is in line with the contents of the discussion paper titled A NEW APPROACH TO ENFORCEMENT dated 5th March 1998 as presented to the aviation community on the 6th March 1998 by the Chairman of the CASA Board'.

27/3/98 The regional manager gave notice to the South Pacific Seaplanes chief pilot that he was considering cancelling or suspending his chief pilot approval as a result of the facts and circumstances relating to the events of 24 March 1998 and 26 March 1998. The chief pilot was allowed 7 days to provide reasons why his approval as chief pilot should not be cancelled.

30/3/98 The chief pilot/general manager of a rival floatplane operation wrote to the Chairman of the CASA Board, detailing his concerns about the safety of South Pacific Seaplanes operations. Copies of that letter were also sent to the Minister for Transport and Regional Development, and to BASI. The Acting Director Aviation Safety replied on 23 April 1998 with an assurance that the concerns expressed in the letter were being given the most serious consideration and that, if evidence was found, CASA would take appropriate action.

2/4/98 Following an informal conference with the South Pacific Seaplanes chief pilot on 1 April 1998, the regional manager advised that he was still not convinced that he should not cancel the chief pilot's appointment on the grounds that his performance was no longer of an acceptable standard. However, the regional manager also indicated that he was not convinced that he should cancel the appointment as he was of the opinion that the failure of the chief pilot to meet his responsibilities was not wilful.

The regional manager decided to grant the chief pilot a further 28 days to satisfy the regional manager that he should not act against his approval. He also indicated that during that period CASA would conduct a safety audit of South Pacific Seaplanes. The extension of time would not affect CASA's duty to take other action in the event of further safety issues arising.

21/4/98 A safety audit of South Pacific Seaplanes was commenced. The audit team was led by the Manager Safety Audits (south-east region), and included a flying operations inspector, the assigned senior airworthiness inspector, and an administration officer. The audit was completed on 23 April 1998.

23/4/98 As a result of the safety audit nine non-compliance notices were issued (four grade 2, three grade 3, and two grade 5). The non-compliance notices are related to:

- pilots operating in excess of flight and duty time limits (2);
- procedures and instructions for the Cessna 185 not in the company operations manual;
- copies of expired maintenance releases not being kept by the operator;
- non-submission of major defect reports by the operator or chief pilot;
- passenger manifests not being compiled and maintained in accordance with the Orders or Regulations;

- deficiencies of procedures and operational practices identified in the operations manual which did not reflect the actual procedures and practices. One of the eight deficiencies identified related to operations into alighting areas that were in conflict with actual practices;
- non-transfer of Certificate of Registration to the new owner; and
- Certificate of Registration holder not ensuring the daily inspection was carried out to Schedule 5.

At the safety audit exit meeting on 23 April 1998, the operator and chief pilot generally accepted the findings, although some discussion ensued on certain issues. A debrief on the safety audit was also provided to the regional manager and the district flying operations manager.

5/5/98 The final report of the safety audit team was provided to the regional manager. The report recommended:

> 'Based on the results of the audit, the history, the unsatisfactory acquittal of issues covered in "show causes" and their approach to safety issues, it is the consensus of the team that South Pacific Seaplanes AOC be immediately suspended pending cancellation'.

An addendum from the Team Leader was attached, who stated in part:

> '1. Introduction of a Cessna 185 Floatplane by South Pacific Seaplanes.
>
> 'As indicated in the report, the team noted that on 2nd December 1997, SPS applied to CASA to have their AOC amended to include a Cessna 185 floatplane as one of the types of aircraft to be operated under that AOC.
>
> 'The application appeared to have been given a higher priority to facilitate the commercial needs of the operator. As such the AOC was reissued to include the Cessna 185 floatplane on 5th December 1997. Evidence was not available on file to indicate the requirements outlined in Part 1 of the Air Operators Certification Manual had been fulfilled…
>
> 'The holder of the AOC had not submitted amendments to their Operations manual covering the introduction of a new type of aircraft. Neither had any amendments been raised up to the time of this Audit'.

In addition, the addendum referred to the 'informal conference' held on 9 May 1997, and the subsequent letter from the regional manager sent to the Managing Director of South Pacific Seaplanes:

> 'This letter, other than reminding the MD of his responsibilities under Para. 28BE and BF of the Act failed to meet the requirements laid down in the amendments contained in the Compliance and Enforcement Manual covering informal conferences i.e. CASA's legal representative will draw up a simple written agreement specifying:
>
> - The specific corrective or remedial action the MD has agreed to undertake
> - The manner in which the MD will discharge his obligations under the agreement
> - The time frame within which the MD will complete the tasks he has agreed to undertake
> - The specific basis on which the delegate will decide whether or not the MD has successfully discharged his corrective and/or remedial obligations…'

6/5/98 The regional manager, as delegate of CASA, provided the Managing Director of South Pacific Seaplanes with a Notice of Suspension of Air Operators Certificate No. BK 535224-06. He stated his belief that there existed facts and circumstances that justified the suspension of the Air Operators Certificate, under section 28BA(3) of the Civil Aviation Act, on the grounds that the company had breached conditions of its Air Operators Certificate. He also stated he had

reason to believe that there was a serious risk to air safety if the company's Air Operators Certificate was not suspended. He then provided details of the facts and circumstances pertaining to his actions.

The Managing Director was also advised that he may apply to the Administrative Appeals Tribunal, within 28 days, for review of the decision. He was also required to surrender the South Pacific Seaplanes Air Operators Certificate to the district flying operations manager by 8 May 1998.

6/5/98 The Manager Safety Audits advised the regional manager that the South Pacific Seaplanes chief pilot suspension period had lapsed, and recommended that the chief pilot's approval be cancelled.

The following day the assigned flying operations inspector also recommended to the regional manager that action be taken against the chief pilot's approval.

7/5/98 The regional manager also provided the Managing Director with a Notice of Proposed Action to Cancel Air Operators Certificate No: BK 535224-06 in accordance with subsection 28BA(3) of the Civil Aviation Act 1988. The facts and circumstances upon which he was considering the cancellation of the Air Operators Certificate were similar to those used for the Notice of Suspension issued on the previous day.

7/5/98 The regional manager notified the South Pacific Seaplanes chief pilot that on the basis of the evidence available to him, after the safety audit, he was not convinced that he should not cancel the chief pilot approval, on the grounds that the performance of the chief pilot was not of an acceptable standard.

However, the regional manager also stated that because the South Pacific Seaplanes Air Operators Certificate was under suspension there was no safety requirement demanding that he make a decision concerning the chief pilot approval at that time. However, he also indicated that should the Air Operators Certificate suspension be revoked, he would be required to make a decision regarding the chief pilot's approval.

The South Pacific Seaplanes Managing Director was also advised of the intentions of the regional manager.

8/5/98 The South Pacific Seaplanes chief pilot was notified by the regional manager of additional grounds upon which he would rely when deciding whether to cancel the chief pilot approval. The chief pilot was given until 4.00 p.m., 13 May 1998, to provide the regional manager with reasons why he should not rely on those additional grounds when making his decision as to whether to cancel the chief pilot's approval. Due to an administrative error, that period was extended to 15 May 1998.

10/5/98 The South Pacific Seaplanes chief pilot wrote to the regional manager, providing a detailed response to the facts and circumstances detailed on 8 May 1998. He also made the point that many of the issues raised happened before he became chief pilot.

11/5/98 South Pacific Seaplanes unsuccessfully applied to the Administrative Appeals Tribunal for a 'stay' order to be granted, with regard to the suspension of their Air Operators Certificate. The Tribunal noted that there were no grounds upon which it could 'stay' the suspension, but that it would do what it could to expedite matters.

13/5/98 The South Pacific Seaplanes Managing Director sent an urgent facsimile to the Acting General Manager, Aviation Safety Compliance Branch, advising that the company was in crisis as a result of the Air Operators Certificate suspension. He indicated that the company was now compliant and deserved to have its Air Operators Certificate reinstated, but could not get a response from the regional manager. He stated that the jobs of eight employees and the two principals were in jeopardy and appealed for immediate consideration.

17/5/98 The South Pacific Seaplanes Managing Director was advised by the Acting General Manager that he would not take any action at that time as he understood there was to be a meeting the next day, at Bankstown, between the Managing Director and CASA representatives. He indicated that he would await the results of that meeting with interest.

18/5/98 The regional manager, district flying operations manager, district airworthiness manager, and a legal officer, met the South Pacific Seaplanes Managing Director and chief pilot for an 'Informal Conference'. The matters discussed included the deficiencies listed in the 'show cause' and suspension letters, as well as the performance of the chief pilot. After the Managing Director and chief pilot had departed, the CASA officers concluded that CASA did not have sustainable grounds to cancel the South Pacific Seaplanes Air Operators Certificate, or to continue with the suspension action. However, the regional manager considered that South Pacific Seaplanes should continue to be placed under pressure to remain committed to compliance. He proposed that CASA should set out a number of conditions to which South Pacific Seaplanes were to comply. If the conditions were acceptable to South Pacific Seaplanes they might apply for a fresh stay order in the Tribunal. CASA would not oppose such an order if the Tribunal agreed to make the stay subject to those conditions.

19/5/98 As a result of the meeting on 18 May 1998 CASA officers indicated they would consent to a stay of suspension on the condition that:

1. South Pacific Seaplanes would lodge with CASA by 8 June 1998 a maintenance scheme for its aircraft which was satisfactory to CASA.
2. South Pacific Seaplanes would ensure that aircraft defects would be recorded in the maintenance release in accordance with the Regulations and the Orders.
3. South Pacific Seaplanes would ensure that all its pilots were aware of, and would comply with, the procedure for recording defects on maintenance releases.
4. A revised operations manual for South Pacific Seaplanes would be lodged with CASA by 8 June 1998.
5. South Pacific Seaplanes would have initiated a safety plan acceptable to CASA by 8 June 1998.
6. Until compliance with conditions 4 and 5 above, the South Pacific Seaplanes chief pilot would not be rostered to fly more than 15 hours in any 7-day period.

Those conditions were agreed to by South Pacific Seaplanes.

21/5/98 South Pacific Seaplanes made a new application to the Tribunal for a stay, which was granted, subject to the previously agreed conditions. The wording of condition 4 was changed by the Administrative Appeals Tribunal to read:

> '(d) The applicant will lodge with the respondent a revised operations manual no later than 8 June 1998 which manual is to be satisfactory to the respondent'.

Copies of the stay order, and amended conditions, were provided to South Pacific Seaplanes, and to CASA. South Pacific Seaplanes subsequently recommenced flying operations.

25/5/98 The Manager Safety Audits wrote to the regional manager expressing his extreme disappointment at the decision to allow South Pacific Seaplanes to resume operations. He stated:

> 'The audit team identified a number of serious deficiencies which caused the team to recommend suspension of the AOC. This recommendation was subsequently endorsed by yourself, the responsible DFOM and DAM's and led to the suspension. Thereupon a 'show cause' letter was sent to the MD of South Pacific Seaplanes asking WHY their AOC should NOT be cancelled.

'If CASA felt the deficiencies were serious enough to warrant suspension, surely, we needed to satisfy ourselves that South Pacific Seaplanes had corrected ALL deficiencies and therefore had satisfied CASA that they met the requirements outlined in section 28(1) (a) and (b) of the Civil Aviation Act.

'Afterall are we not supposed to be looking after the fare paying passengers?'.

25/5/98 In reply to the Manager Safety Audits the regional manager wrote, in part:

'Let me make it clear that I am satisfied that South Pacific Seaplanes meets the requirements to hold an AOC, otherwise I would not have agreed to consent to the stay of the suspension. Your assumption that the company has been given a period of grace in which to meet the minimum standards is not correct. I have not applied a lower standard to South Pacific Seaplanes'.

1/6/98 The Manager Safety Audits queried the regional manager as to whether appropriate personnel would be available to assess all documents which South Pacific Seaplanes were required to submit by 8 June 1998. The regional manager advised that the assigned flying operations inspector had told him that a flying operations inspector would be assisting in assessing the operations manual, with appropriate input from the assigned senior airworthiness inspector.

The Manager Safety Audits pointed out that the senior airworthiness inspector would be on leave during the following week.

1/6/98 Details of developments relating to South Pacific Seaplanes were provided to the CASA Board Safety Committee.

A letter of complaint from a rival organisation was sent to all CASA Board members, regarding CASA's handling of the operations of South Pacific Seaplanes.

5/6/98 The South Pacific Seaplanes chief pilot provided a new operations manual to the assigned flying operations inspector during a meeting at Bankstown.

11/6/98 The South Pacific Seaplanes Managing Director notified the district flying operations manager that the company had met the conditions as agreed at the Administrative Appeals Tribunal on 21 May 1998. As proof of that compliance he listed the actions taken by the company.

The Acting General Manager, Aviation Safety Compliance Branch, was required to provide a briefing on South Pacific Seaplanes developments to the CASA Board Safety Committee on 12 June 1998. Whilst following up on the conditions imposed upon South Pacific Seaplanes he found that the maintenance scheme (condition 1) did not appear to have been assessed by the district office, and expressed his concern to the regional manager.

12/6/98 The Acting General Manager, Aviation Safety Compliance Branch, advised the CASA Board Safety Committee that South Pacific Seaplanes continued to be closely monitored, with particular regard to the term of the conditions to which the company's Air Operators Certificate has been made subject. The operator appeared to be complying with the applicable legislative requirements as well as the additional requirements contemplated by the conditions on its Air Operators Certificate.

He also reported that the assigned flying operations inspector had been seconded to another program for several weeks, and that the assessment of recent amendments to the company's operations manual might be suspended or curtailed until his return.

A Committee member asked if there had been any significant changes, other than the pilot's abode, between the time of withdrawing the Air Operators Certificate and reinstating it. The Acting General Manager, Aviation Safety Compliance Branch, advised the Committee that the main change was attitudinal and that technical advice he had received was consistent with the decisions that had been made.

The Committee expressed concern at the way this matter had been handled.

12/6/98 The Manager Safety Audits wrote to the regional manager, criticising the way in which the South Pacific Seaplanes matter had been handled. He referred to the Seaview Commission of Inquiry's Executive Summary page 51 which stated:

> 'The Commission repeatedly observed situations in which the operator was asked for information or assurances, that were then accepted without either investigation or follow up. That was the approach even when the operator had a clear motive to conceal or misrepresent the truth. Such an absence of skepticism fosters in operators contempt for the regulatory authority'.

He further quoted from page 4 of the same document:

> 'The travelling public have a right to expect that their safety will be protected by the regulatory body'.

The regional manager replied that it was the Manager Safety Audits' job to lead the safety audit of South Pacific Seaplanes, and indicated that the recommendations of the report were accepted and acted upon. The regional manager also stated that it was up to the controlling district office to deal appropriately with any ongoing issues with South Pacific Seaplanes, and that he had every confidence in that office's ability to do that.

15/6/98 The Acting General Manager, Aviation Safety Compliance Branch, wrote to the regional manager advising that he was unable to fully answer questions put to him at the Board Safety Committee meeting on 12 June 1998. He stated:

> 'I trust you will see the basis of my concern:
>
> - CASA acted to suspend this company's [South Pacific Seaplanes] AOC for a number of quite specific reasons.
> - The company sought, but was denied, a stay of that decision in the AAT.
> - CASA then agreed not to object to a stay, if certain conditions were met.
> - You now say these conditions were met-in certain instances, merely by virtue of certain documents having been lodged with CASA.
>
> 'It is still unclear whether the documents that were required to be lodged by a certain time were, in fact, timely lodged… What is of greater concern, however, is that, whilst "compliance" with certain conditions may have been achieved by virtue of certain documents having been lodged, until those documents are assessed, at least on a preliminary basis-and specifically in respect of the matters giving rise to the suspension-how can CASA say that things are any "better" now than when they were when the decision to suspend was given?'.

He further indicated to the regional manager:

> 'I will ask that the substance of SP's submissions be assessed as a matter of urgency, at least against the specific and most critical issues that gave rise to the decision to suspend in the first instance'.

19/6/98 The minutes of the CASA Board meeting show the following:

> '*Aquatic Air Pty Ltd*
>
> 'The Board discussed at length the unorthodox approach relating to the initial suspension, and later reinstatement with conditions, of the operator's AOC.
>
> 'Management was asked to ensure that compliance with the conditions introduced by agreement to the operator's AOC be carefully and closely monitored. In addition, the Board asked that the operations of Aquatic Air continue to be closely scrutinised.

'The Board also asked management to advise whether other seaplane operators have also had recent surveillance and, if so, to be advised of the results. The Board agreed that, if not, surveillance of the other seaplane operations should be undertaken, with a report to be provided to the July Safety Committee meeting'.

30/6/98 The regional manager advised the Acting General Manager, Aviation Safety Compliance Branch, that the maintenance system for South Pacific Seaplanes had been assessed and found acceptable.

6/7/98 The regional manager formally advised the Managing Director of South Pacific Seaplanes that he did not propose to cancel the Air Operators Certificate, although he was satisfied that the matters alleged in his notice of 7/5/98 had occurred and that, in the absence of mitigating factors, there were grounds upon which he could and should cancel the Air Operators Certificate. The regional manager indicated that in taking his decision he had taken into account the matters put to him by the Managing Director of South Pacific Seaplanes by way of explanation, and the corrective actions taken by the company. However, the Air Operators Certificate expiry date would be amended to 30 November 1998.

9/7/98 The district flying operations manager issued Air Operators Certificate No. BK535224-07 to South Pacific Seaplanes. The Air Operators Certificate was to remain in force until 30 November 1998.

10/7/98 The assigned flying operations inspector advised the district flying operations manager that despite his being very interested in being involved in the Airspace 2000 project, his present workload precluded him from being available (for the project) over the next 2 weeks.

In a list of his planned activities for July, the assigned flying operations inspector indicated that the number one item was to assess the South Pacific Seaplanes response to the conditions imposed by the regional manager at the recent stay proceedings, including the evaluation of the revised company operations manual.

20/7/98 The Manager Safety Audits wrote to the Acting General Manager Aviation Safety Compliance Branch reporting that he had recently carried out an audit on another seaplane operator, during which he compared the operations manual of that company with the 'new' operations manual of South Pacific Seaplanes. He subsequently found a discrepancy in the South Pacific Seaplanes manual relating to daily inspection requirements.

The Manager Safety Audits then went on to describe a meeting he had with the regional manager and district flying operations manager, during which the regional manager stated that the review of the South Pacific Seaplanes operations manual had been put on hold as the assigned flying operations inspector had initially been on leave, and had then been seconded to the Airspace 2000 project for the next 2 weeks.

20/7/98 The Acting General Manager Aviation Safety Compliance Branch, requested the regional manager, in response to specific requests for updated information from the Board Safety Committee, to reply to the following questions (in part):

'Has Aquatic Air been, and does it continue to be, closely monitored with a view to ensuring compliance with the terms and conditions of its AOC?

'If not, why not, and to what extent has the company been monitored?

'If so, what are your views in relation to the extent to which the company has complied, and continues to comply, with the terms and conditions of its AOC?'.

21/7/98 The regional manager responded to the request from the Acting General Manager. He stated (in part):

'In order to keep SPS focussed on remaining in compliance [the regional manager] varied the AOC to have it expire at the end of November 1998 instead of expiring at the end of May 1999.

'The monitoring of company's operations has returned to the scheduled ASSP cycle (having regard to the amended expiry date) with the next audit being an operator's meeting (to be held in September 1998). This will be followed by a periodic inspection and assessment of a compliance statement prior to the re-issue of company's AOC in November 1998'.

26/7/98 South Pacific Seaplanes Cessna 185, VH-HTS, crashed near Berowra during a commercial passenger carrying flight.

The CASA Director Aviation Safety gave notice to the South Pacific Seaplanes Managing Director of his decision to suspend Air Operators Certificate BK535224-06 pending an investigation into facts and circumstances that may justify the cancellation of the Air Operators Certificate. He indicated that there may be a serious risk to safety if the Air Operators Certificate was not suspended immediately, pending an investigation into those facts and circumstances.

29/7/98 A preliminary report to the Director Aviation Safety into the Aquatic Air accident by the assistant director, aviation safety compliance, found (in part):

'A preliminary assessment of the Operations Manual by a member of the investigation team on 29 July 1998 (the first occasion on which any member of CASA staff has conducted such an assessment) indicates that the manual is unsatisfactory. Further amendments would be necessary before the manual could satisfy regulatory requirements'.

2. ANALYSIS

2.1 Introduction

The circumstances of this accident were found to be consistent with the aircraft departing from controlled flight and colliding with terrain while manoeuvring after a go-around from an unsuccessful landing approach. The investigation established that the aircraft was capable of normal operation prior to impact. No evidence was found to indicate that the pilot suffered from any pre-existing condition that could have adversely affected his capacity to function normally. Nor was there evidence found to indicate that the actions of the other occupants of the aircraft contributed in any way to the accident.

An analysis of the events and circumstances leading to and surrounding this occurrence, has revealed underlying deficiencies in the safety of commercial flight operations conducted by the operator. Deficiencies were also identified in the oversight of those operations by the safety regulator.

2.2 Unsafe acts

The pilot had been tasked to fly four passengers from Palm Beach to an alighting area at Berowra, in order to lunch at a waterside restaurant. The weather conditions in the area were generally unfavourable for flight in accordance with the visual flight rules. His decision to attempt the flight was apparently based upon his previous experience in the area. The fact that the aircraft was observed to follow the Hawkesbury River, then Berowra Creek, would suggest that the low cloud base necessitated flying over water due to insufficient clearance between the surrounding terrain and cloud.

The decision by the pilot to make a downwind landing approach towards the south-west may have been based on a number of considerations, including:

- worsening weather conditions to the south, inhibiting an approach from that direction;
- minimising flying time;
- shortening the taxiing distance after landing; and
- an incorrect appreciation of the strength of the downwind component.

The aircraft was subsequently observed by witnesses to descend to a height of about 30 ft before commencing a go-around. At that point, the accepted practice would have been to climb ahead, then turn left towards Berowra Waters to provide a greater distance in which to climb, until the aircraft was safely above the surrounding terrain.

However, on this occasion the pilot elected to climb straight ahead into Calabash Bay. Due to the downwind component, the overall climb gradient would have been adversely affected, reducing the ability of the aircraft to outclimb the terrain in that direction. The pilot then turned back, either to avoid terrain, or to land in the opposite direction.

Observers noted that the aircraft commenced to turn near the middle of the bay, briefly to the right, then predominately to the left, effectively decreasing the area available for manoeuvring. The downwind component would also have had the effect of increasing the radius of turn. In addition, mechanical turbulence and downdrafts in the area were likely to have adversely affected the performance and controllability of the aircraft.

The width of the area where the aircraft was seen to turn was about 500 m. As the calculated turning radius of the aircraft at the observed angle of bank was about 153 m, it is possible that the turn could have been completed successfully if the pilot had adopted a procedure that utilised all of the area available. Although the final few seconds of the flight were not witnessed, it is likely that the aircraft stalled during the turn at a height too low to permit the pilot to regain control before colliding with terrain.

The decision by the pilot to attempt to turn back, and the manner in which he executed that manoeuvre were the culminating unsafe acts contributing directly to this occurrence.

2.3 Local factors

The following local factors identified during the investigation are considered to have had a direct influence on the decisions made by the pilot.

2.3.1 Pilot knowledge and skills

The pilot was regarded by other company pilots as being competent and having good aircraft handling skills. He had been provided with conversion training by the chief pilot to allow him to operate the Cessna 185. That training comprised 0.4 hours, and reportedly included basic handling, low-level flying, landings and moderate turns. It is unlikely that that amount of training would have been sufficient to permit a comprehensive introduction to the aircraft type, particularly when considering the type of intended operation. There was no provision for steep turning or stall recognition and recovery, nor is there any evidence to indicate that the pilot subsequently received training or practice in these procedures.

When the incumbent chief pilot of South Pacific Seaplanes resigned on 23 September 1997, rather than cease operations, the Managing Director arranged to continue operations under the Air Operator Certificates of two other companies until a replacement chief pilot could be approved. The chief pilot of Air Pioneer, who held responsibilities under the Civil Aviation Orders for the supervision of operations authorised by that Air Operators Certificate, did not visit South Pacific Seaplanes, nor did he assess the proficiency of the pilots of that organisation. Because the chief pilot of Air Pioneer was based in another state, it is unlikely that he could have been aware of the actual standard of flight operations conducted by South Pacific Seaplanes. Thus it is likely that the proficiency of the pilot was not assessed before he commenced operating into Berowra on 5 October 1997.

When a new chief pilot was subsequently appointed, the pilot was already operating into Berowra and his proficiency to operate at that location was not subsequently reviewed. Moreover, there is no documented evidence that the proficiency of the pilot to operate into Berowra was ever checked, a location described by the majority of pilots interviewed as being a very difficult, or the most difficult of alighting areas used by South Pacific Seaplanes.

As a result, it is unlikely that the pilot had an adequate knowledge of the handling capabilities of the aircraft when deciding to carry out a steep turn within a confined area, in adverse conditions. Furthermore, it is likely that the capability of the pilot to safely operate at Berowra had not been assessed by the operator.

2.3.2 Company procedures at Berowra

The South Pacific Seaplanes operations manual failed to provide information designed to offer guidance to company pilots operating at specific locations, including Berowra.

CAAP No. 215-1(0) recommended a section A6.13 to provide for 'operations at selected locations'. However, the South Pacific Seaplanes operations manual (1 June 1998), which

complied with the format of the CAAP, and had ben accepted by CASA, had section A6.13 listed as Reserved.

The ALA register, which had been a constant problem since the inception of South Pacific Seaplanes, was designed to identify the location of alighting areas used by the company, together with such things as dimensions, obstacle clear areas, powerlines and other information primarily relating to operations on the water surface.

However, there was no information provided to company pilots as to what procedures and guidelines needed to be followed at Berowra or other locations to operate safely. Such information should have been included in section A6.13 of the operations manual, to give guidance on a number of matters including:

- weather minimums;
- standard entry and departure routes;
- approach procedures;
- take-off and landing procedures;
- missed approach procedures;
- decision points;
- terrain avoidance; and
- abnormal operations.

The absence of such information became evident during the investigation when past and present company pilots all described differing procedures when operating at Berowra.

In the absence of any company guidance, the pilot had to make a series of operational decisions relying on his previous experience. His decision to make a downwind approach, under the prevailing conditions, placed the aircraft and its occupants at risk. When the pilot eventually decided to carry out a go-around it was likely that, up to that point, he had not considered the options available to him. Without adequate knowledge, experience or procedures, he was unable to develop and execute a suitable action plan, resulting in the accident.

2.3.3 Weather conditions

The flight was carried out in an area under the influence of a moist north-easterly airflow, causing areas of rain and showers, with associated low cloud and reduced visibility. The effect of that was to significantly reduce the options available to the pilot when deciding how he would conduct the approach to Berowra.

2.3.4 Commercial pressures

The type of charter operations conducted by South Pacific Seaplanes catered for a niche market that relied heavily on providing a unique service, particularly when flying people to waterside restaurants. Many people would have looked forward to such a special occasion. Preparations probably would have included restaurant bookings and other arrangements. A last-minute cancellation of the flight could have caused disappointment and a loss of revenue to the restaurant and South Pacific Seaplanes. Every pilot involved with the operation would have been aware of that, and been more likely to attempt to complete a flight.

There was no evidence to suggest that the management of South Pacific Seaplanes directly influenced the pilot's behaviour on the accident flight. The decision of the pilot to attempt that flight was more likely to have been influenced by self-imposed pressures, and by the safety culture of the company.

2.4 South Pacific Seaplanes organisational deficiencies

A number of pre-existing deficiencies arising from the managerial actions and policies of the company were identified during the course of the investigation. Although such organisational deficiencies did not have an immediate adverse effect, they were nevertheless considered to have contributed to the promotion of local factors or increased the likelihood of unsafe acts.

2.4.1 Inappropriate safety culture

An examination of the history of this company revealed a series of events reflecting adversely on the standard and safety of its operations, and the quality of its association with the safety regulator. In isolation, each of those events could be attributed to a variety of differing reasons. Solutions to 'fix' those problems were often devised and implemented. However, attempting to find individual solutions was most likely to be unsuccessful as the environment or culture that promoted those events remained generally unchanged. Although the solution was to change the culture of the organisation, that concept went unrecognised.

The culture which determined how the company carried out its business was largely influenced by the values and beliefs of the company directors. Those values and beliefs appear to have been more directed towards economic or commercial imperatives rather than operational considerations, as evidenced by a number of complaints from ex-employees concerning scheduling of flights, overloading of aircraft, and pressure to continue flying operations in adverse weather. The operator's lack of previous commercial aviation experience also influenced the way things were done.

In such an organisation, employees quickly become aware of the prevailing culture, and in most situations adapt their behaviour to comply with what they believe is expected of them. Were South Pacific Seaplanes a non-operational organisation, its culture might have been appropriate; as things stood, its culture had the effect of adversely influencing the safety of flight operations.

2.4.2 Poor flight operations procedures

The type of commercial flight operations conducted by the company involved operating small single-engine floatplanes in a more hazardous environment than a similar land-based operation. Those additional hazards included such things as: low-level flight within confined areas, unregulated alighting areas, reduced aircraft performance, adverse wind conditions, changeable surface conditions, and restricted missed approach areas.

The operator had a responsibility to provide policies and procedures designed to safeguard the conduct of flight operations and the safety of fare-paying passengers. A critical element was the management of human error. Clear and specific procedures, designed to facilitate safe operations at specific locations by minimising the occurrence and consequences of human error, were not provided by South Pacific Seaplanes. The effect of that omission was to oblige pilots to make potentially crucial decisions, at critical stages of a flight, without adequate information upon which to make and give effect to those decisions. That deficiency also went unrecognised by the safety regulator.

2.4.3 Inadequate training and proficiency checking

When the Cessna 185 was introduced to South Pacific Seaplanes operations, the operator had a responsibility to ensure that pilots were familiar with all normal and emergency systems and procedures of the aeroplane to be flown, as well as possessing sufficient recent experience or training in the aeroplane type to safely complete a proposed flight. A similar obligation was imposed on a pilot in command.

The adequacy of the conversion training provided to South Pacific Seaplanes pilots was questionable, as evidenced by the brief conversion training provided to the pilot. Of the pilots interviewed, not one recalled ever having attempted stall recovery manoeuvres during conversion training, nor having performed steep or maximum rate turns, either when training or during subsequent proficiency checks. There was also no evidence that go-around manoeuvres were practised or assessed.

By its very nature, the type of flying undertaken by South Pacific Seaplanes often required the aircraft to be flown to alighting areas located in confined spaces, where the potential for low-level manoeuvring was significantly increased. CAAP 92-1(1) described the recommended guidelines for water alighting areas, and indicated that the application of those guidelines would enable a take-off or landing to be completed safely, provided that the pilot in command had sound piloting skills and displayed good airmanship.

It is likely that the conversion training, and subsequent proficiency checking provided by South Pacific Seaplanes, did not fully equip company pilots with the sound piloting skills necessary to safely operate the Cessna 185 aircraft in all foreseeable circumstances.

2.4.4 Incompatible goals

The standard of South Pacific Seaplanes flight operations and aircraft maintenance appeared to have been adversely influenced by commercial considerations. The effect of that was demonstrated by a poor history of compliance with CASA requirements.

Although, at times, there was an apparent willingness by the company to meet regulatory requirements, it became evident by continuing episodes of non-compliance that those efforts were largely ineffectual. The company culture appeared to discourage any significant change to the way in which things were done. As a consequence, there was an incompatibility between the commercial goals of the operator and of the safety requirements of commercial flight operations.

2.5 Civil Aviation Safety Authority

CASA is the authority responsible for the safety regulation of civil air operations in Australia. As a routine part of the investigation, the role of CASA was evaluated.

2.5.1 Effectiveness of surveillance

The normal frequency of periodic surveillance for a non-scheduled charter operator was 18 months for a flying operations inspection, and 24 months for an airworthiness inspection. Although South Pacific Seaplanes was a non-scheduled charter operator, the nature of its flight operations could be regarded as more hazardous than a similar land based operation. Since the company commenced operations in 1994 there had been only two periodic flying operations inspections carried out. However, in response to a constant stream of adverse reports and complaints, CASA inspectors made numerous unscheduled visits to South Pacific Seaplanes. In the main, those visits identified safety deficiencies requiring corrective action by the operator.

In general, the speed of response, and the conduct of unscheduled inspections, was sound. However, most actions taken by CASA were in reaction to past events. The problem with such unscheduled visits was that they were associated with some form of problem. In other words, the arrival of CASA officers usually heralded trouble for the operator.

The relationship between the Managing Director and the assigned flying operations inspector had not been very good, as evidenced by the Managing Director's efforts to have the assigned flying operations inspector replaced during 1996, and the apparent breakdown in communica-

tions between them. However, there is no evidence that the conduct of the assigned flying operations inspector was other than fair and professional. The Managing Director claimed that the assigned flying operations inspector had indicated that CASA was not a teacher. The Managing Director also said that, as an Air Operators Certificate holder, he had not been provided with any guidance regarding what was expected of him, and felt that CASA could improve liaison by fostering closer, more informal relationships with the industry.

As indicated earlier, CASA inspectors responded promptly and properly to reports concerning South Pacific Seaplanes. However, in hindsight, a more proactive, less formal approach by the regulator could have seen a greater frequency of scheduled and unscheduled inspections, which were not exclusively reactions to identified deficiencies. Such surveillance activities would also have been more effective if they had focussed upon evaluating the company's safety culture and identifying its underlying systemic deficiencies, rather than the symptoms of such deficiencies.

2.5.2 Ineffectual use of compliance and enforcement procedures

An examination of the regulatory compliance history of South Pacific Seaplanes would raise the question as to how far CASA would let the company go before their Air Operators Certificate was cancelled. Numerous reports by CASA inspectors detailing safety deficiencies, the issuing of non-compliance notices and aircraft survey reports, and a long history of non-compliance all strongly suggested that the company represented a significant threat to the safety of its fare-paying passengers.

Initially, the response by CASA was to adopt a 'graded compliance path' to try to achieve adherence to regulatory standards, in keeping with the policies and procedures of CASA. On one occasion the South Pacific Seaplanes Air Operators Certificate was renewed for 3 months, and once for 2 months, in order to enable the operator to comply with regulatory standards. The issuing of an Air Operators Certificate for a limited period, solely to give an errant operator time to meet requirements, was not in accordance with the provisions of section 28 (1) of the Act, nor with the advice provided to Delegates at para 2.3.1 of the Air Operators Certification Manual (vol. 1).

A number of recommendations were made by district inspectors, and a safety audit team, for stronger actions to be taken against the company, including suspension and/or cancellation of the Air Operators Certificate or chief pilot approval.

Despite those recommendations it appeared that there was a diminution of resolve to carry through more rigorous enforcement actions, particularly at the regional level. This is detailed in the summary at subsection 1.22. In general, the operator would be given notice to undertake certain remedial actions. The operator would then give certain undertakings that would be accepted by the regulator.

However, it was not unusual for such undertakings to fall by the wayside, only to arise again at some later stage because the deficiencies that the operator had undertaken to correct had not been rectified in practice. For example, certain deficiencies identified during the safety audit in April 1998 had been the subject of a 'show cause' action in April 1997. In May 1997 the regional manager wrote to the South Pacific Seaplanes Managing Director advising that CASA would not take any further action to suspend or cancel the South Pacific Seaplanes Air Operators Certificate at that time. He wrote:

> 'I would expect to see an improvement in the performance of your company with regard to its compliance with its obligations under the Civil Aviation Act and Regulations'.

At that time, the operator was not asked to enter into any formal agreement with CASA regarding corrective actions.

It was not the objective of this investigation to determine whether the decision of the regional manager not to oppose a 'stay of suspension' in the Administrative Appeals Tribunal on 21 May 1998 was appropriate. That matter is the subject of a separate, internal CASA inquiry. However, it is clear that the regional manager, when he made that decision, was satisfied that South Pacific Seaplanes could meet the requirements to hold an Air Operators Certificate, subject to meeting the conditions imposed by the Administrative Appeals Tribunal.

Compliance with three of the conditions imposed on the company was required by 8 June 1998. However, South Pacific Seaplanes re-commenced operations on 21 May 1998. The only conditions immediately applicable were:

- Aircraft defects were to be recorded in the maintenance release.
- The company would ensure that all pilots were familiar with, and would comply with, the procedure for recording defects on maintenance releases.
- The chief pilot would not be rostered to fly more than 15 hours in any 7 days, until a revised operations manual had been lodged with CASA by 8 June 1998, and the initiation, by the same date, of a safety plan acceptable to CASA.

It is difficult to see how the safety of flight operations conducted by South Pacific Seaplanes, between 21 May and 8 June 1998, would have been improved by the imposition of the above conditions, when compared to the standard of operations that gave rise to the original 'show cause' action.

However, there was then a failure at the regional level to adequately followup on whether South Pacific Seaplanes had in fact complied with the stay conditions. That follow-up process is described at subsection 1.22. In that context it is also worthwhile reconsidering recommendation 7 of the Seaview Commission of Inquiry regarding the effectiveness of CASA's enforcement policy (see subsection 1.20.4).

These events only came to light because of the accident on 26 July 1998. Experience would suggest that CASA has had, and continues to have, similar albeit unquantifiable problems with other operators. Of the various enforcement actions taken by CASA in the two years from 1 July 1996 to 31 July 1998, there were only two Air Operators Certificates cancelled, yet the total number of Air Operators Certificates was in the order of 900. It is difficult to accept there was such a low incidence of non-compliant Air Operators Certificate holders during that period.

2.5.3 Poor division of responsibilities

The Acting General Manager Aviation Safety Compliance Branch, was responsible for coordinating compliance and enforcement related activities. Branch accountability for those functions was facilitated at the local level through three regional managers who reported directly to him. However, he indicated he did not have the staff, nor the delegations, to adequately oversight the actions of regional managers.

As a result, the local regional manager took control of the actions taken against South Pacific Seaplanes in May 1998, and negotiated the subsequent stay of proceedings. However, the acting general manager, Aviation Safety Compliance Branch, became concerned about whether the stay conditions imposed on South Pacific Seaplanes had been complied with, and asked the regional manager to assess, as a matter of urgency, the substance of the South Pacific Seaplanes submissions. The Board Safety Committee also expressed concern at the way the South Pacific Seaplanes matter had been handled.

Although responsible for co-ordinating the compliance and enforcement related activities of the Aviation Safety and Compliance Branch, in reality the Acting General Manager had little or

no authority to ensure that the outcomes from those activities were in accordance with the objectives of CASA.

2.5.4 Organisational learning

An essential characteristic of most successful organisations is their ability to learn and improve their processes in relation to the demands of their operating environment, and on their past performance.

> 'A Learning Organisation is an organisation skilled at creating, acquiring and transferring knowledge, and at modifying its behaviour to reflect new knowledge and insights… Without accompanying changes in the way work gets done, only the potential for improvement exists'.
>
> —David Garvin, 'Building a learning organisation', *Harvard Business Review*, July–August 1993.

Once a safety deficiency had been identified to, and accepted by CASA, it could be expected that a change process to address such deficiency would be implemented, in order to minimise the likelihood of a recurrence. However, it would appear that CASA has been ineffectual in accomplishing such change.

Some of the organisational safety deficiencies associated with CASA's performance that were identified in this investigation, had also been found in previous investigations and inquiries. Responses from CASA to the recommendations listed below, indicated that the recommendation was either accepted or changes were being implemented to address the deficiency concerned. However, the related safety deficiencies, and BASI recommendations that were issued, include:

- **poor division of responsibilities between staff**
  - BASI Investigation Report – 9301743
  - BASI Interim Recommendation – IR940258
  - Plane Safe Recommendation (k)
  - BASI Investigation Report – 9401043
  - BASI Interim Recommendation – IR940258 (a)

- **poor procedures in relation to the issuing of AOCs**
  - BASI Investigation Report – 9301743
  - BASI Interim Recommendation – IR930224
  - BASI Investigation Report – 9403038
  - BASI Recommendation – R960073
  - BASI Investigation Report – 9402804
  - BASI Interim Recommendation – IR950061

- **poor procedures in relation to surveillance of operators**
  - BASI Investigation Report – 9301743
  - BASI Interim Recommendation – IR930244
  - BASI Investigation Report – 9402804
  - Commission of Inquiry into relations between the CAA and Seaview Air Report of the Commissioner Recommendations 8, 9, 10, 23, 24, 25, 26, 27 28 29, and 32
  - BASI Investigation Report – 9401043
  - BASI Interim Recommendation – IR940258(b)
  - BASI Investigation Report – 9600094
  - BASI Interim Recommendation – IR960127 (i) and (ii)

- **inadequate review of operations manuals due to 'acceptance' rather than 'approval'**
  - BASI Investigation Report – 9401043
  - BASI Investigation Report – 9402804
  - BASI Interim Recommendation – IR950074
  - BASI Investigation Report – 9403038
  - BASI Investigation Report – 9503057
  - Recommendation from the Coronial Inquiry into the Accident involving VH-NEJ at Tamworth (BASI Investigation Report – 9403057)

- **inadequate legislation to prevent use of 'borrowed' AOCs**
  - BASI Investigation Report - 9402804
  - Commission of Inquiry into relations between the CAA and Seaview Air Report of the Commissioner (September 1996) – Recommendations 18 and 19

- **poor procedures for the assessment and approval of chief pilots.**
  - BASI Investigation Report – 9600094
  - BASI Interim Recommendation – IR960127 (iii) and (iv)

2.6 Inadequate or absent safety defences

Safety defences that should have prevented this accident were inadequate or missing from the aviation system within which South Pacific Seaplanes conducted its commercial operations.

The company appeared to rely exclusively on pilot judgement as its defence for ensuring safe operational decisions in difficult environments. Such an approach was prone to failure, particularly when the company did not ensure that quality experience, gained from earlier floatplane operations, was transferred to its last group of pilots

The conduct of flight operations should have been safeguarded by procedures and guidelines designed to provide company pilots with the knowledge to operate safely at the various locations serviced by South Pacific Seaplanes. Such procedures and guidelines should have also provided a system of layered defences designed to promote an awareness of hazards, how to minimise those hazards, the provision of safety barriers to contain hazards, and escape mechanisms should other defences fail.

The absence of such a basic defence system remained unrecognised by the operator, and by CASA officers. Numerous articles and occurrence reports dealing with the principles and practical application of system safety have been published by BASI in the past. That material has been widely disseminated throughout the aviation industry.

3. CONCLUSIONS

3.1 Findings

1. Aquatic Air Pty Ltd, trading as South Pacific Seaplanes, held a valid Air Operators Certificate authorising charter operations in Cessna A185E floatplane aircraft.
2. The pilot held a valid commercial pilot licence, endorsed for float operations on the type of aircraft being flown.
3. The pilot held a valid class 1 medical certificate.
4. The pilot occupied the left control seat.
5. The pilot had received pre-flight information relating to the area of intended operation, including appropriate weather forecasts.
6. There was no evidence found to indicate that the performance of the pilot was adversely affected by any abnormal pre-existing physiological or psychological conditions.
7. There was no documented evidence found to verify that the proficiency of the pilot to use the Berowra water alighting area had been assessed by South Pacific Seaplanes.
8. The aircraft had been issued with a valid maintenance release.
9. The Certificate of Registration of VH-HTS had not been transferred from Outback Air Pty Limited to South Pacific Seaplanes.
10. The weight and balance of the aircraft were within specified limits.
11. The aircraft carried sufficient fuel for the intended flight.
12. The physical characteristics of the water alighting area at Berowra complied with the recommendations of CAAP 92-1(1).
13. The weather conditions affecting the route from Palm Beach to Berowra were considered marginal for flight in accordance with the visual flight rules.
14. There were no specific procedures and guidelines contained within the operations manual, or any other South Pacific Seaplanes document, to provide information to pilots as to how to operate safely at Berowra, or other locations used by the company.
15. The direction chosen by the pilot for a landing approach was inappropriate for the prevailing wind conditions.
16. Following an unsuccessful landing approach to the south-west, the pilot attempted to undertake a go-around procedure that took the aircraft into the confines of Calabash Bay. During an attempt to turn back, the pilot lost control of the aircraft, which then collided with terrain before control could be regained.
17. At the time of impact, the aircraft was capable of normal flight.
18. The likelihood of the pilot and passengers surviving the accident was reduced by:
    (a) a lack of, or failure to use, upper body restraints; and
    (b) the incorrect fitment and subsequent failure of the rear bench seat, inboard seat-belt attachment bolt.

19. Latent organisational deficiencies identified within South Pacific Seaplanes included:
    (a) a safety culture not conducive to the safety of flight operations;
    (b) inadequate guidance to pilots when operating at specific locations;
    (c) inadequate training and checking of company pilots; and
    (d) incompatible goals that placed commercial considerations ahead of the safety of fare-paying passengers.
20. Latent organisational deficiencies identified within CASA included:
    (a) surveillance activities more directed to dealing with safety symptoms rather than underlying systemic issues;
    (b) ineffective use of regulatory compliance and enforcement procedures in the face of overwhelming evidence that the operations of the company did not meet minimum safety standards; and
    (c) an ineffective division of regulatory responsibilities between the Acting General Manager Aviation Safety Compliance Branch and the regional manager.

3.2 Significant factors

1. The water alighting area at Berowra was surrounded by steep-sided, relatively high terrain, offering limited space for aircraft to be safely manoeuvred in flight.
2. The area was adversely affected by poor weather conditions, with strong winds, low cloud, rain showers and areas of reduced flight visibility.
3. The South Pacific Seaplanes operations manual did not provide guidance to pilots for the safe operation of company aircraft at the Berowra alighting area.
4. It is likely that the pilot's decision making was influenced by the commercial considerations of the intended flight.
5. The pilot elected to make a landing approach in a direction inappropriate for the prevailing wind conditions.
6. Without adequate knowledge, experience and procedures to develop and execute a suitable action plan, the pilot attempted to carry out a go-around procedure into a confined area. Limited conversion training and checking did not adequately provide the pilot with the skills to safely manoeuvre the aircraft within that area.
7. There were serious organisational deficiencies in the management and conduct of charter operations by South Pacific Seaplanes.
8. Although aware of significant safety deficiencies existing within South Pacific Seaplanes, CASA was ultimately ineffective in ensuring that those deficiencies were rectified, and that the company operated safely. However, the key deficiency of a lack of guidance for operations at specific locations remained unrecognised.

4. SAFETY ACTIONS

4.1 Recommendations

R980277

The Bureau of Air Safety Investigation recommends that the Civil Aviation Safety Authority:

(i) more appropriately define the minimum flight experience requirements for a chief pilot applicant of an organisation engaged in the carriage of fare-paying passengers, by clearly defining the relevance of particular types of experience to the nature of the operation; and

(ii) develop a process to assess the ability of a chief pilot applicant to administer and manage regulatory and safety compliance.

R980279

The Bureau of Air Safety Investigation recommends that the Civil Aviation Safety Authority:

(i) formulate requirements for inclusion into the documentation of Air Operators Certificate holders conducting in command under supervision training flights, specific instructions relating to the conduct of those flights; and

(ii) specify the minimum levels of relevant type experience, training and approval of pilots conducting the supervisory element of in command under supervision flights.

R980280

The Bureau of Air Safety Investigation recommends that the Civil Aviation Safety Authority:

(i) formulate requirements for all operators conducting fare-paying passenger flights to develop and publish procedures, for the guidance of crews, that permit the safe operation of aircraft from those locations that do not meet the minimum physical characteristics of licensed aerodromes;

(ii) require initial and routine checks of competency of crews operating into those locations, or locations with similar physical characteristics; and

(iii) record these checks in company training records.

R980284

The Bureau of Air Safety Investigation recommends that the Civil Aviation Safety Authority:

(i) as a matter of some urgency, issue CAR 119. The Civil Aviation Safety Authority proposed this action in its 14 July 1995 response to Interim Recommendation 950074.

[The response stated (in part): 'Proposed new CAR part 119 dealing with operator certification will make it clear that operations manuals must be approved prior to issue of an AOC'.]

(ii) also approve subsequent amendments to operations manuals before the amendments become effective, as it currently does with maintenance manuals and training and checking manuals.

4.2 Local safety action by CASA

During the course of the investigation it was revealed that South Pacific Seaplanes, at a time when the company was without a chief pilot, had continued to operate under the Air Operators Certificate of another organisation. Inadequate supervision of flying operations during that period may have contributed to this accident.

The use of 'borrowed' Air Operators Certificates, or 'Air Operators Certificates of convenience', had been identified as a safety issue by the Bureau of Air Safety Investigation in previous investigation reports.

Following the loss of Aero Commander, VH-SVQ, en route between Williamtown and Lord Howe Island on 2 October 1994, a Commission of Inquiry was established to investigate the relationship between the then Civil Aviation Authority and Seaview Air. In his report, the Commissioner specifically addressed the issue of an operator 'borrowing' the Air Operator Certificate of another operator.

Recommendation 18 of that report stated:

> 'That the Civil Aviation Regulations be examined, and if necessary amended, to prevent sham arrangements involving the use of another operator's AOC'.

On 30 September 1998, amendment 28 to section 82.0 of the Civil Aviation Orders was notified in the Commonwealth Gazette, and came into effect on 1 October 1998. This amendment incorporated a new subsection 3 'Conditions Relating to Borrowed Certificates' to legislate the use of 'borrowed' Air Operators Certificates.

4.3 Other safety action

As a result of this and other investigations the Bureau of Air Safety Investigation is currently developing recommendations in relation to training and checking procedures of all pilots engaged in fare-paying passenger flights, in order to evaluate proficiency on aircraft type.

Additionally, as a result of this investigation the Bureau of Air Safety Investigation is currently developing a recommendation relating to the provision and use of upper body restraint to all occupants of aircraft used in fare-paying passenger flights. It is further examining perceived safety deficiencies in relation to the adequacy of maintenance procedures of aircraft modified by Supplemental Type Certification that change the original role and operating environment of the aircraft.

Any safety output issued as a result of this analysis will be published in the Bureau's Quarterly Safety Deficiency Report.