

*Original file*

**IN THE DISTRICT COURT  
AT QUEENSTOWN**

**CRI-2011-059-000314**

**CIVIL AVIATION AUTHORITY  
Informant**

v

**RODERICK GUNN  
Defendant**

Hearing: 5, 6, 7, 8, 9, 12, 13, 14, 15 March 2012  
2, 3, 4, 5, 6, 9, 10, 11, 12 July 2012  
3 September 2012

Appearances: A F Pilditch and J F Parnell for the Informant  
M A Muir and V Withy for the Defendant

Judgment: 7 March 2013

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**JUDGMENT OF JUDGE K J PHILLIPS**

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*This judgment was delivered by me  
on Thursday 7<sup>th</sup> March ..... at 10 ..... am/pm*

*Registrar/Deputy Registrar*

M. M. McSweeney  
Registrar  
District Court



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## Glossary of abbreviations

[1] Throughout this judgment, the following abbreviations may be encountered:

AGL	Above Ground Level. A reference to height above the terrain. Although generally heights in airline operations are measured in AMSL when it is important to identify the separation between cloud or aircraft and the ground, AGL is used as a measurement of height. References are measurements in feet.
AIP	Aeronautical Information Publication New Zealand. A document containing operating instructions published by the people responsible for managing air space in New Zealand; in this case mainly Airways which is a fully owned subsidiary of the New Zealand Government.
AOC	Air Operations Certificate
AMSL	Above Mean Sea Level. This is a reference to altitude and is measured in feet. Most altitudes, such as the aerodrome, the height of terrain and the altitude of an aircraft are measured in AMSL. Sometimes referred to as QNH.
ATC	Air Traffic Controller. The person in the Air Traffic Control Tower at Queenstown responsible for providing air traffic services including weather information.
ATIS	Automatic Terminal Information Service : An automated service broadcast over the terminal frequencies providing weather and other information to pilots and airport users.
Bowen Three/Bungy Four	Departures procedures designed for Queenstown Runway 23.
CAA	Civil Aviation Authority
CAA 1990	Civil Aviation Act 1990
CARs	Civil Aviation Rules made pursuant to s 28 of the Civil Aviation Act 1990.
Cloud Base/Cloud Ceiling	The cloud base or ceiling is the height above ground level of the lowest layer of cloud covering more than half the sky. A cloud base or ceiling is generally referred to as either “broken

cloud” or “overcast cloud”. It is typically measured in feet AGL.

Cross Winds	All wind comprises a cross wind component and either a head wind or tail wind component which depends on the direction of the wind relative to an aircraft. A cross wind is that component of the wind that comes across or at 90 degrees to an aircraft.
DME	Distance Measuring Equipment
ECT	Evening Civil Twilight. This is a point in time, in the evening, defined as occurring when the geographic centre of the sun is 6 degrees below the mathematical horizon. It is a theoretical model of the sun’s centre being 6 degrees below an ideal horizon.
Exposition	A suite of operating instructions and manuals prepared by Pacific Blue for its own operations as part of its certification requirements.
IAS	Indicated Air Speed
ICAO	International Civil Aviation Organisation
IFR	Instrument Flight Rules : Rules that permit aircraft to be flown in conditions where a pilot may not be able to see the terrain or other aircraft, such as in cloud. The pilot flies the aircraft using instruments and ground-based navigational aids.
IMC	Instrument Meteorological Conditions : Weather conditions that require pilots to fly primarily by reference to their instruments and therefore under IFR. Typically this involves flying in cloud.
km	kilometres
kts	knots
MSA	Minimum Safe Altitude
MLat or MultiLat	A reference to a surveillance system operated on a multi lateration basis which has been designed to provide airways staff in the Queenstown airport control tower with an additional ability to accurately locate aircraft operating in the Queenstown basin.

Pacific Blue	Pacific Blue Airlines
PANS-OPS	ICAO procedures for air navigation services – aircraft operations.
PIC	Pilot in Command
QNH	An altimeter sub-scale setting to obtain elevation when on the ground.
RNAV	Area Navigation
SH	Slope Hill VOR
SID	Standard Instrument Departure
TOLGE	Pacific Blue Airlines description of Tollgate
Tollgate	Waypoint Designation for RNAV purposes. TOLGE and Tollgate are positions on the Bowen Three departure procedure that equate approximately with a position above the gate to the Remarkables access road.
VOR	VHF Omni-directional Radio range
VFR	Visual Flight Rules. Rules that require a pilot to fly an aircraft, avoid terrain and other aircraft, by looking out the windows and being able to see.
V1	Critical engine failure recognition speed or take off decision speed
VOR/DME	VHF Omni-Directional Range/Distance Measuring Equipment A navigation aid that is a component of the Queenstown departure procedures.
ZQN or Queenstown	A reference to Queenstown aerodrome.

## **Introduction**

[2] The defendant, Roderick Gunn, is charged that at Queenstown on 22 June 2010 he operated an aircraft (a Boeing 737-8FE serial number 34015 registration ZK-PBG) in a careless manner. That is an offence under s 43A(1), Civil Aviation Act 1990. He pleaded not guilty. As a result, there has been an extensive hearing into the aircraft's take off from Queenstown on that day.

## **Synopsis of allegations**

[3] The defendant was the PIC of a Boeing 737-800 commercial passenger aircraft on 22 June 2010. In the cockpit with him was First Officer Christian Rush. The aircraft arrived in Queenstown at 3.15 pm on 22 June 2010 as Pacific Blue flight "PBN88". The aircraft, as a scheduled Pacific Blue flight "PBN89", was due to depart from the Queenstown airport to Sydney at 4.30 pm. Owing to inclement weather conditions there were delays in departure. At 5.25 pm as PIC the defendant commenced the take off "roll". Aboard the aircraft were some 64 passengers, four cabin crew and the two pilots. The informant's case is premised on the basis the defendant commenced the take off after the ECT restriction had commenced; that the light was fading; that there were poor weather conditions and poor visibility (the visibility having been further impacted upon by a low cloud ceiling); cross winds, at the time of the decision to take off being made, exceeding the maximum cross winds permitted for the take off; during the initial stages of the flight the defendant, as pilot in command, did not achieve the required altitude at certain points.

[4] In all, the informant says the defendant was careless in his operation of the aircraft and that he occasioned unnecessary endangerment to the passengers, the crew and the aircraft itself.

## **The Law**

[5] Section 43A of the CAA 1990:

**43A Operating aircraft in careless manner**

(1) Every person commits an offence who operates any aircraft in a careless manner.

- (2) Every person who commits an offence against subsection (1) of this section is liable,—
- (a) In the case of an individual, to a fine not exceeding \$7,000;
  - or
  - (b) In the case of a body corporate, to a fine not exceeding \$35,000.
- (3) The provisions of this section shall be in addition to and not in derogation of any regulations or rules made under this Act.

[6] It is clear that whether the defendant, Mr Gunn, flew the aircraft carelessly is a matter of fact to be decided by the Court. The legal test that comes from the decisions is: “Did the defendant exercise the degree of care and attention a reasonable, prudent pilot of a Boeing 737-8FE would exercise in the circumstances as they existed?” *CAA v Imstepf* DC Hamilton CRN 03039005078, 8 November 2004, and *CAA v McKee* DC Auckland CRN 4004501242, 1 July 2005, are authorities to this point and effect.

[7] Judge Maze in *Imstep* said at paragraph [55]:

Whether the defendant flew the balloon carelessly is a matter of fact. Analogy with the authorities relating to careless use of a motor vehicle are appropriate and therefore the test is: did the defendant exercise the degree of care and attention a reasonable, prudent pilot would exercise in those circumstances: (*Simpson v Peat* [1952] 2 QB 24 of 28).

and at paragraph [56]:

The defendant does not challenge that definition, nor the proposition no specific mens rea need be proven (*Civil Aviation Department v McKenzie* [1983] NZLR 78). If the prosecution proves beyond reasonable doubt the elements of the offence, it is for Mr Imstepf to prove absence of fault on the balance of probabilities. Pilots are required to put risk avoidance as a priority in their operations, that being a burden deliberately imposed by Parliament (*Hammond J in Holland v Police* (HC Hamilton AP 26/96, 17 April 1997)). Mr Cooper challenges this applies to s43A offences, but I am satisfied it does.

(The underlining emphasis is mine.) I adopt Judge Maze’s findings (inter alia).

[8] Judge Taumanunu in *McKee* said:

[42] Section 43A of the Civil Aviation Act 1990 creates a public welfare regulatory offence.

[43] If the prosecution proved beyond reasonable doubt the elements of the offence, it is for the defendant to prove absence of fault on the balance of probabilities: *Civil Aviation Dept v McKenzie* [1983] NZLR 78.

[44] Both counsel have referred me to the authority of *Simpson v Peat* (1952) 2 QB 24, 27.

[45] The test in respect of the section 43A charges is as follows: did the defendant exercise the degree of care and attention a reasonable and prudent pilot of a hot air balloon would exercise in the circumstances: *Simpson v Peat* (1952) 2 QB 24,28; *Civil Aviation Authority v Imstepf* (Unreported, 8 November 2004, Hamilton District Court, CRN 03039005078-79).

I agree with the above statements. In respect of paragraph [45] of *McKee* as above I insert the words "...a Boeing 737-800 passenger jet aircraft" for the words "a hot air balloon".

[9] The offence created by s 43A of the Civil Aviation Act 1990 is a strict liability offence. I refer to the judgment of Stevens J in *CAA v Van Den Burg* 2008 DCR 531 at paragraph [45]:

[45] Having regard to the statutory context just described and the authorities referred to above, I am satisfied that the correct classification of the offence in s 43A of the Act is one of strict liability. My conclusion is that, properly analysed, the offence created by s 43A falls within the second of the three categories adopted in *MacKenzie*. It is an "offence of strict liability" as identified at [12] in *Tell*.

[46] This conclusion is influenced by the application of two of the three features identified by Richardson J quoted at [30] above. Section 43A is clearly aimed at protecting public safety. It is one of several "safety offences" in Part 5 of the Act and is therefore to be properly viewed as a public welfare offence. However, it should be one that falls in the middle band of the *MacKenzie* categories as the penalties provided are substantial and, while less than those provided in ss 43 and 44, are not such that the offence could be classified as "minor". The third feature of Richardson J's analysis is not applicable to the wording of s 43A. I agree with the submission on behalf of the Authority that the drafting changes to ss 43 and 44 also suggest that this third feature is not applicable to those sections. The same is true of s 65 of the Marine Transport Act which the Court of Appeal in *Tell* held to be a strict liability offence.

[47] There were two other factors mentioned by Richardson J, in the passage quoted at [29] above, which are relevant as to why this is not a category one offence, that is, one requiring proof of *mens rea*. The first is the highlighted passage emphasising that it is artificial to speak in terms of *mens rea*. Liability under public



welfare legislation of this type rarely turns on the presence or absence of a particular state of mind. It is compliance with an objective standard of conduct that is critical. The second factor is that the defendant would ordinarily know far better than the prosecution how the breach occurred and what he had done to avoid it. I agree with counsel for the Authority that both of these factors are applicable to s 43A of the Act.

[48] Applying the approach adopted by the Court of Appeal in *Tell*, quoted at [35] above, produces the same answer. The essential point is whether, in the context of an alleged breach of s 43A, the pilot must know, or be reckless as to whether, his manner of operation fell below the standard of a reasonable and prudent pilot. I agree with the submission on behalf of the Authority that there is a clear and necessary implication from the terms of s 43A and the statutory context surrounding it, that such knowledge or recklessness is not a necessary ingredient of the offence. The absence of any reference to knowledge or recklessness in s 43A is not of itself decisive. However, the method of expression used in the section leads to the conclusion that the subjectivity of the offence is confined to the element of “operates any aircraft”. The question of whether the manner of operation fell below the standard of a reasonable and prudent pilot must be judged from an objective viewpoint.

### **Case for the informant**

[10] The position of the informant is that the defendant operated the aircraft carelessly and that the allegation of carelessness is established to the required level of proof on a number of “...inter-related failings” (closing submissions on behalf of informant at paragraph 1.1). These factors are said to be as follows:

- i. The Exposition directed the defendant to depart “at least” 30 minutes prior to ECT. ECT being 5.44 pm on 22 June 2012. The defendant was bound to conform with the Exposition in accordance with CAR 121.7. The defendant departed from Queenstown at approximately 5.25 pm.
- ii. Cross-wind : The Exposition prohibited its aircraft from taking off from Queenstown if the cross winds exceeded 16 kts on a wet runway. The informant alleges the ZQN runway was wet on the day; and that prior to departure the ATC and ATIS information detailed cross winds in excess of 16 kts with averages and gusts exceeding the take off minima for ZQN.
- iii. Cloud base : The defendant was required to be assured before take off that he was able to meet the requirement to maintain visual reference to ground from take off to the crossing altitude at Tollgate. When he took off the cloud base

was 1500 feet AGL and therefore lower than the minima of 2300 feet AGL as required by the NZAIP for ZQN operations. This, in combination with the requirement to fly visually for the visual segment of the departure to an altitude of 4400 feet AMSL (as required by the Exposition), meant the cloud base was lower than the minimum needed to ensure that the defendant as PIC could fly visually to the required altitude at Tollgate.

- iv. Operation after take off : The defendant, because of the cloud conditions being below minima and the take off being within the prohibited ECT period, had to fly at approximately 1000 feet to avoid entering low cloud in the Frankton Arm area. He was not able therefore to maintain 500 feet of vertical separation as required by CAR part 91.301. The aircraft then descended by 300 feet to 700 feet above Lake Wakatipu triggering alerts (mainly a “don’t sink”); with flaps extended at flap setting 15 with a 200 kt speed limit applying. The informant says the defendant flew in such a manner that the plane approached speeds coming close to exceeding the 200 kt limit with the First Officer then calling “speed speed”. As a result the defendant reduced speed by reducing thrust which resulted in an inability to engage the auto pilot because the plane was untrimmed. The plane banked sharply and excessively in order to turn round the “Deer Park Heights”. The bank angle increased beyond 35 degrees. The Flight Management System then sounded an alert to get the defendant to bring the aircraft back within a normal range of bank. It is the informant’s case that all of this occurred at low altitude at a critical phase of the flight and that it came about as a result of the decision of the defendant to take off when the conditions did not exceed the minima.
- v. Behind Deer Park Heights the plane was flown into IMC when he was required to maintain visual reference under IFR. Alternatively, the situation was such that there was a high level of unnecessary risk of entering IMC.
- vi. That the correct crossing altitude at Tollgate in terms of the Exposition required the aircraft to be at an altitude of 4400 feet because there was a potential need for the aircraft anti-ice systems to be used in respect of both

the engines and the wing. Therefore 1100 feet had to be added to the required crossing altitude at Tollgate in terms of the Exposition Bowen Three departure table. The actual crossing height of the aircraft at Tollgate on the day is as agreed fact, namely, 4000 feet AMSL. The informant says this is 400 short of the required minimum crossing altitude.

[11] It is the informant's case that the above particulars of careless operation are such that any one particular in isolation would meet the test for careless operation of an aircraft in that it would result in a finding that the defendant did not exercise the degree of care and attention that a reasonable and prudent pilot of a large passenger jet aircraft carrying members of the public would exercise. The informant further alleges that any one of the particulars in conjunction with another particular would lead to the same conclusion (see closing submissions of informant at paragraph 1.4).

[12] The informant submits that once each particular has been considered by the Court, then the Court should consider the circumstances of the departure in totality and then apply the carelessness test as detailed.

### **Case for the defendant**

[13] Counsel for the defendant submits the Court must focus on the legal test (paragraph 3.14 of the closing submission for the defendant). Mr Muir for the defendant said:

The issue for the Court is always whether the degree of care and attention exercised by the pilot in question fell below that of a reasonable and prudent pilot in the circumstances.

[14] He submitted the Court was required to make a determination in respect of three matters, namely:

- i. what were the actual circumstances;
- ii. what was the actual care and attention exercised by the pilot in those circumstances;

- iii. was the actual care and attention exercised by the PIC exercised to the stand or level that a reasonable pilot would have exercised in the circumstances as found to exist.

Upon completion of those determinations, the Court is then further required to assess whether the defendant has been careless which must be a question of fact and degree. The expert evidence available to the Court is to be used in making that assessment. The defendant disputes that any breach of the Exposition occurred but, even if an Exposition breach was established on the evidence, that does not equate to carelessness.

[15] Counsel for the defendant in his opening at paragraph 24 referred to the wording of the ECT requirement in the Flight Crew Route Guide (which is part of the Exposition) and the words at the end of the "...operational limitation ... to allow for visual manoeuvring". The defendant's position is premised on the basis that the particular departure planned and briefed did not involve a return to Queenstown for planned emergencies such as the loss of engine on take off and that, therefore, there were no difficulties in respect of ECT and the daylight remaining at the time of the departure as the only visual manoeuvring was on the visual segment of the departure.

[16] The defendant submits that the Bowen Three departure requires terrain clearance/visual reference down the Frankton Arm and behind Deer Park Heights; that the visibility and take off minima requirements in the Exposition - Flight Crew Route Guide 3 is visibility of 10 kilometres within the Queenstown basin and IFR take off minima is 2300 feet AGL.

[17] The defence raises issues of a factual nature between the case for the informant and the defendant as to:

- i. "...the required set heading height at Tollgate"
- ii. the actual altitude of the aircraft at this fix;

- iii. the standard circuit height, as argued for the informant, at 4000 feet QNH (2800 AGL) (the defence submits 2700 feet QNH as per the Exposition)
- iv. the pilot's own observation as regards to cloud conditions as against the ATIS report (which the defence says was incorrect);

(The defence submits in respect of the cloud base that the reported cloud level was wrong and that the aircraft was visible as it crossed Tollgate at an altitude higher than the reported overcast layer.)

- v. on the cross wind issue, the defence argues the differences in the Exposition and the data in the "Boeing Flight Crew Operational Manual" for the 737-800 series aircraft; that the take off with 16 kts of cross wind complied with the "A1 Flight Crew Operating Manual" limit; in any event, the defence says the 16 kt limitation is not determinative of carelessness as the question for the Court is whether any established breach of such limitation establishes to the required standard that the defendant did not exercise the degree of care and attention of a reasonable and prudent pilot in a general sense when regard has been made to the higher Boeing cross wind guidelines as against Pacific Blue's 16 kt limitation.
- vi. in respect of the minimum altitude at Tollgate, the defence argues that in the Exposition the required altitude is specified and is determinative. It is an agreed fact that the aircraft was at 4000 feet QNH over Tollgate. The defence says the required altitude was 3600 feet QNH allowing for bleed plus an increment of 300 feet for engine anti ice. This is against the informant's position of 4400 feet QNH being required allowing for an increment of 1100 feet for engine and wing anti ice. The issue is whether or not there is a need to include wing anti ice in pre take off calculations.
- vii. in respect of the alerts and the speed call, the defendant says that the speed call indicated situational awareness only and the alerts were unremarkable.

[18] In assessing these competing claims I must refer to the test that I am required to use, (ie), an objective test of whether or not the defendant has exercised the degree of care and attention a reasonable and prudent pilot of a Boeing 737-8FE aircraft would exercise in the circumstances pertaining at the time prior to, at and after the departure of the aircraft from Queenstown. That reasonable and prudent pilot putting risk avoidance as a priority.

[19] I refer once again to Stevens J in *CAA v Van Der Burg* at paragraph [48]:

...However, the method of expression used in the section leads to the conclusion that the subjectivity of the offence is confined to the element of “operates any aircraft”. The question of whether the manner of operation fell below the standard of a reasonable and prudent pilot must be judged from an objective viewpoint.”

[20] I remind myself that if the prosecution proves beyond reasonable doubt the elements of the offence, it is then for the defendant to prove absence of fault on the balance of probabilities.

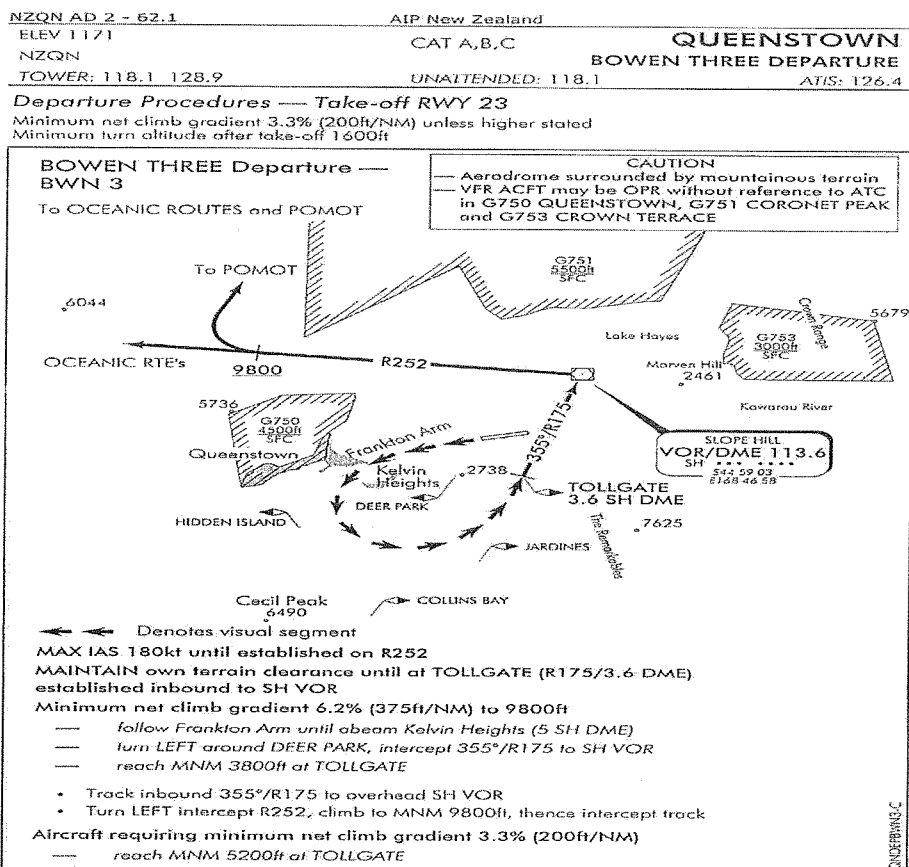
### **Background Details**

[21] The scheduled flight PBN89 was due to depart Queenstown for Sydney at 4.30 pm on 22 June 2010. This required a reasonably speedy turnaround of both aircraft and passengers with the aircraft arriving at 3.15 pm.. At the time the aircraft arrived in Queenstown the weather conditions were poor, with low cloud, rain and wind affecting ZQN. Some scheduled flights in and out of ZQN had been cancelled due to the poor weather. The weather at the scheduled departure time of 4.30 pm was not suitable for departure. However, the crew and the passengers remained onboard the aircraft as the cockpit crew watched and waited upon a change in the weather.

[22] During this period of waiting time there were various communications between the defendant as PIC, First Officer Rush, and the Queenstown ATC. The communications included (amongst other things), ECT, the cloud ceiling, and wind generally but including cross winds. ATIS automated messages were also received by the cockpit crew. The defendant requested permission to taxi to the end of runway 23 ready for take off and by 17:24:34 the aircraft was positioned facing

down the runway. Further checks were made in relation to the cloud ceiling and cross winds. The take off roll had begun by 5:25:09. The departure procedure confirmed for flight PBN89 was the Bowen Three procedure. This required a departure to the west on runway 23 with a left turn and ascent to the south and southeast before the aircraft was to begin its ascent to the north between Deer Park Heights and the Remarkables Mountain Range.

[23] The Bowen Three departure is better depicted in the following diagram which is taken from the NZAIP. Within the document the minimum climb gradient is detailed (the minimum climb gradient is the rate at which the aircraft must gain altitude in order to achieve a safe departure and is a rate of the vertical increase in feet per each nautical mile of distance travelled). In this particular instance the minimum climb gradient was required in order to clear the terrain and to gain sufficient altitude to enable the aircraft to ascend to a height above the mountains of the Southern Alps surrounding the Wakatipu Basin.



Effective: 29 JUL 10

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**QUEENSTOWN**  
**BOWEN THREE DEPARTURE**

## **The Civil Aviation Act and the Rules (CAA 1990, CARs)**

[24] The CAA 1990 contains the rules of operations within the New Zealand Civil Aviation system. The CAA 1990 details the obligation to promote safety in aviation in the interests of the general public. The CAA 1990 does this by the creation and enforcement of the CARs. The CARs provide the framework for the operation of the civil aviation system. The CARs set minimum standards of safety to ensure that all participants and users of aviation services are kept safe to the extent possible in aviation.

### **The CARs:**

[25] The Civil Aviation Rules provide: (inter alia)

- i. Part 91 of the CARs provides the general operating and flight rules that apply to all pilots who operate aircraft in New Zealand, whether private, recreational or commercial.
- ii. Part 119 of the CARs applies to all commercial air operations. The CARs (in conjunction with the CAA 1990) impose a responsibility on commercial operators to provide commercial air transportation with the highest possible degree of safety. A commercial passenger airline has to hold an AOC issued under the CARs. The certification process ensures that the AOC holder understands the obligations and is capable of fulfilling the responsibilities then imposed upon it.
- iii. Part 121 of the CARs embodies the rules applicable to commercial air operations conducted in large aeroplanes such as the Boeing 737-800. That Part imposes specific safety requirements on large commercial airline flights.

[26] Flight PBN89 was subject to the CAA 1990 and Parts 91, 119 and 121 of the CARs. Therefore the PIC and his crew had imposed upon them a number of operational requirements and limitations relevant to the operation of the aircraft at, on or from ZQN.



[27] It was not at issue during the course of the hearing that s 13 of the CAA 1990 applied.

### **13 Duties of pilot-in-command**

The pilot-in-command of an aircraft shall—

- (a) Be responsible for the safe operation of the aircraft in flight, the safety and wellbeing of all passengers and crew, and the safety of cargo carried; and
- (b) Have final authority to control the aircraft while in command and for the maintenance of discipline by all persons on board; and
- (c) Subject to section 13A of this Act, be responsible for compliance with all relevant requirements of this Act and regulations and rules made under this Act.

The defendant as PIC was therefore responsible for the safe operation of the aircraft in flight; the safety and wellbeing of all passengers and crew. The defendant had the final authority to control the aircraft while in command and for the maintenance of discipline. In terms of s 13(c) he was responsible for compliance with all requirements of the Act, Regulations and Rules.

### **Queenstown Airport**

[28] ZQN is located in the Wakatipu Basin. It is situated at 1171 feet AMSL. The airport is surrounded by mountainous terrain which includes the Remarkables Mountain Range which is located less than 5 nautical miles to the southeast of the runway. The airport is used by a high volume of traffic. That fact allied with the surrounding terrain provides a challenging aviation environment. It is designated as a “Category X” aerodrome and is therefore subject to special operational considerations. It was not at issue during the course of the hearing that the runway was 30 metres in width in some areas which is assessed as a ‘narrow’ runway and that it did not have runway lights to enable night time or poor visibility operations.

[29] The nature of the airport and its location results in clearly documented landing and take off procedures. These control all take offs and landings. The flight paths, operational requirements and limitations are specified and detailed. Each of

the specific departures that aircraft are permitted to leave the airport on are professionally designed, rigorously tested and documented. The requirements and limitations have been designed to optimise safety. Strict compliance to the procedures is required not only by the CAA, the CARs and the Exposition, but also by the use of commonsense and judgement.

[30] The “Bowen Three” procedure was the relevant departure procedure for PBN89 on 22 June 2010.

### **NZAIP**

[31] This is one of the two sources of the operational requirements and limitations for the Bowen Three departure. In the terms of the departure process, the applicable procedures must be followed as detailed in the NZAIP when preparing, submitting and adhering to a flight plan created in accordance with CAR 91.409. CAR 91.413 expressly prohibits a pilot in command of an aircraft from taking off from an aerodrome unless the weather conditions are at or above the weather minima published for that take off and aerodrome in the NZAIP. PBN89 was being operated under IFR on 22 June 2010.

[32] In respect of the Bowen Three departure the NZAIP imposes the following requirements and limitations:

- i. A pilot in command is required to maintain visual reference with the surrounding terrain for the first segment of the flight, from take off until reaching “Tollgate”. (That part of the departure is described as “the visual segment”) The Tollgate position is identified on the departure chart with the required height for that crossing position. In terms of the Bowen Three departure the minimum height required at Tollgate is 3800 feet.
- ii. The maximum speed the aircraft can reach in the visual segment up to the position described as “R252” is 180 kts. (This is included as a limitation because the aircraft is required to make ‘manoeuvre’ turns between

mountains and the greater the speed the aircraft is travelling at the more space the aircraft requires for such manoeuvre turns.)

- iii. The minimum weather conditions required are a cloud ceiling of 2300 feet AGL and 5 kilometres lateral visibility.

[33] The informant's case is that the Bowen Three departure procedure for flight PBN89 required the defendant as PIC to be able to see the surrounding terrain during the visual segment of the departure from the take off roll until the time the aircraft had reached the Tollgate position and that the defendant was not permitted to depart using the Bowen Three departure unless the cloud ceiling was at least 2300 feet AGL because otherwise his ability to maintain visibility would have been compromised. He was also not permitted to allow the aircraft to exceed 180 kts in the initial stages of the flight.

#### **Pacific Blue Exposition: NZAIP: Discussion**

[34] CAR 119 requires an operator wanting to conduct commercial air transport to prepare and submit for approval an Exposition documenting operating safety procedures and controls applicable to that operator. The Exposition contains safety standards that meet the expectations of the CAA. The Exposition is not in substitution for the NZAIP. The NZAIP must still be followed but with the further requirements detailed in the Exposition. The Exposition co-exists with the NZAIP and is a document specific to the operator's operations. CAR 121 requires each pilot of any large commercial air transport operation to conform with all procedures specified in the Exposition. Pacific Blue's Exposition was approved by CAA as part of the AOC requirements under CAR 119.

[35] Pacific Blue, being a commercial airline operating from Queenstown, had within its Exposition a section in respect of its Queenstown aerodrome operations containing the operational requirements and limitations for departures from Queenstown specific to Pacific Blue's operations.

[36] In the Exposition under “Definitions” was a definition of the word “warning”. A “warning” in the Exposition was defined as information which, if not carefully followed, may result in personal injury or loss of life. Further, the Exposition incorporated the Bowen Three departure procedure but added specific operational limitations relating to PBN89’s departure, namely:

- *Departures could only occur in daylight hours*

Departures could only occur, therefore in terms of ECT, at least 30 minutes prior to ECT. The Exposition was worded in this way:

Daylight operations only. All take offs must occur at least 30 minutes prior to Evening Civil Twilight to allow for visual reference manoeuvring.

ECT is published for each aerodrome in the NZAIP. It was accepted by the parties in this case that on 22 June 2010 ECT was 5.44 pm.

- *Departures could only occur if the cross wind maximum specified in the Exposition was not exceeded*

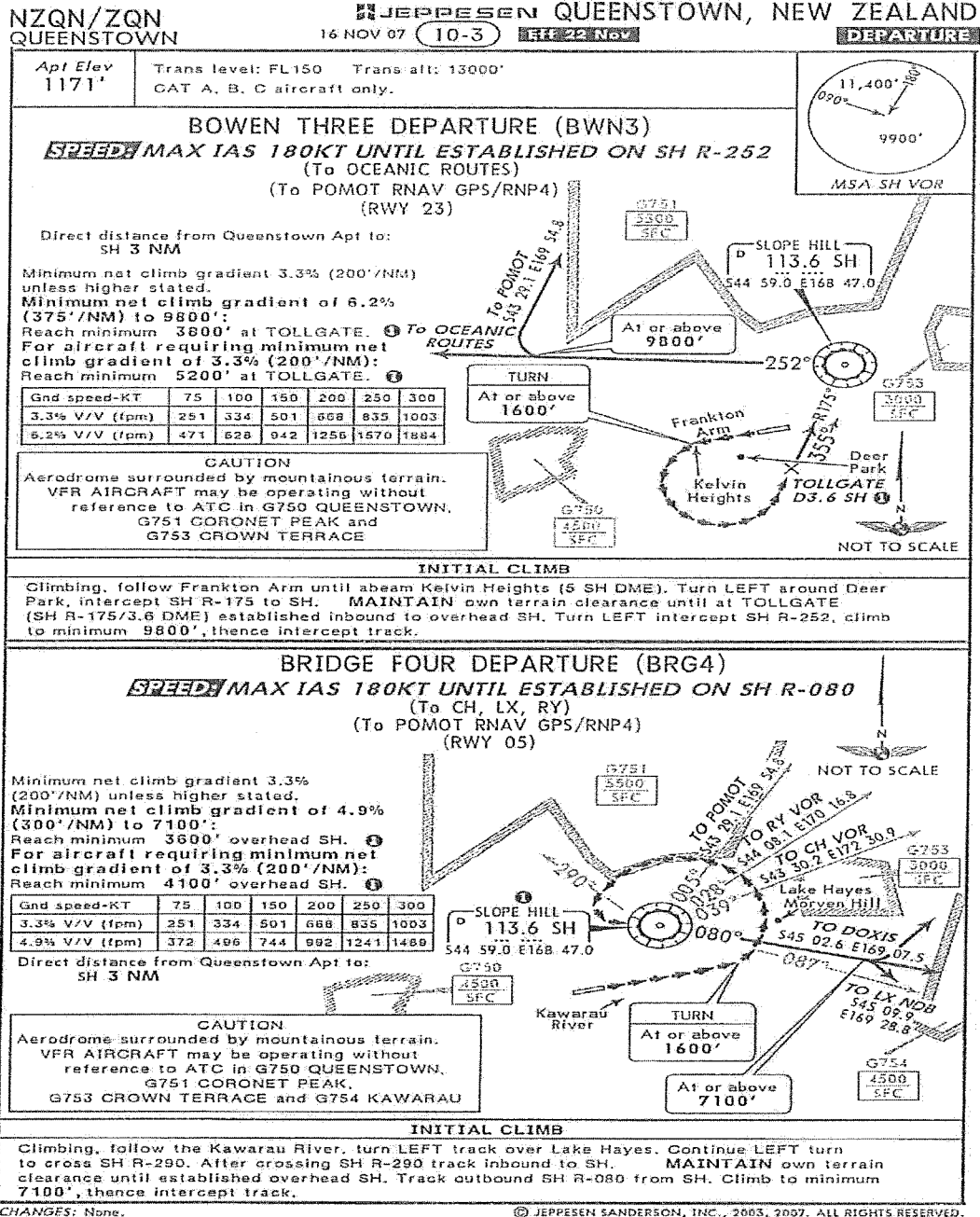
Cross wind limitations relate to the width of the runway and whether a runway was wet or dry. The Exposition set the limitations to a maximum of 27 kts in dry conditions and 16 kts if the runway was wet.

- *Visibility had to be maintained through the visual segments*

The Exposition relates this as the maintenance of visual reference until the minimum crossing altitude is reached. The cloud ceiling reference in the NZAIP and the “visual reference” detailed in the Exposition are the same requirements. The pilot needs to be able to see the terrain to navigate the aircraft.

The correct altitude is determined by the minimum crossing altitude specified in the Bowen Three departure chart in the AIP or the altitude specified in the Bowen Three departure table in the Exposition – whichever is the higher.

The altitude corresponds to the height to which visual reference had to be maintained during the visual segment. In the Exposition (and set out below) is a chart detailing the minimum altitude required to achieve at Tollgate which is therefore the height to which visual reference has to be maintained.



(I refer to documentation Exhibits Folder 2, Tab 33)

[37] The minimum altitude as specified is dependent on such factors as to the weight of the aircraft and factors that would impact upon the aircraft's ability to climb. Once the correct altitude at Tollgate was achieved, the defendant was then able to enter IMC and fly under IFR. Should the weather conditions as reported to the pilot not permit visual reference to be maintained until the correct altitude was reached at Tollgate, the Exposition requires the pilot to remain at the Queenstown airport.

[38] The Exposition detailed that if there was an engine failure prior to the aircraft reaching Tollgate or the aircraft failing to reach the altitude required at Tollgate, the pilot was then required to enter into a Figure 8 circuit within the Wakatipu Basin to prepare for an emergency landing at Queenstown airport. Visual reference and a height of 4000 AMSL (2829 feet AFL) is required for this procedure.

[39] The Category X airport classification of ZQN and the Exposition appear to go along together. The Exposition requires the pilot to be able to see surrounding terrain to safely navigate should an engine fail or other such similar malfunction occur. Entering the Figure 8 circuit or performing an emergency landing, the aircraft is surrounded on all sides by terrain higher than the aircraft, thus visual reference is critical.

#### **Achieving the correct altitude at Tollgate**

[40] Both the minimum altitude and the specific minimum climb gradient are required to be met to ensure that the aircraft will be able to climb to a safe altitude and then divert to an alternate aerodrome or return to Queenstown if there is a malfunction prior to Tollgate.

[41] The achieving of the minimum altitude at Tollgate is to provide assurance that even if there is an engine failure after Tollgate there is sufficient climb performance to clear the mountains and reach a safe altitude. The altitude of 3800 AMSL detailed in the NZAIP has further requirements as to minimum altitude requirements put on it in the Exposition. When anti-ice is applied to the engines and wings there is a reduction in the performance of the engines in respect of climb as

power is diverted to the anti-ice function. A higher altitude at Tollgate is then required to be achieved in order to ensure that even with engine and wing anti-ice on the aircraft would have sufficient performance on one engine to meet the required climb gradient to 9800 feet AMSL and above.

[42] In general terms, therefore, the operational limitations are imposed through the NZAIP and the Exposition. If there are differences the informant's position is that the requirements of the Exposition prevail. In this case the operational limitations relevant are those that relate to the ability of the PIC to see the surrounding terrain during the initial stage of the departure and to be able to successfully navigate in an emergency in the event of any aircraft malfunction prior to the Tollgate position. The Exposition also imposes limitations in relation to cross-winds (particularly the cross-wind exceeding 16 kts on a wet runway) to ensure that the take off is safe. The Exposition imposes speed and altitude limitations that require the PIC to be able to climb to altitudes at the Tollgate position (but not to exceed the maximum speed) to ensure that the necessary rate of climb after Tollgate is available, even if an engine failed.

### **Relevant parts of documents**

[43] The following extracts are from the -

**Pacific Blue  
Operations Manual Suite  
(Part A)  
Volume A1 :  
Flight Crew Operating Manual**

## **O ORGANISATION**

### **0.12.5 Adherence to Legislation, Regulations and AIP's**

All Pacific Blue operating crew members and ground support staff with operational duties, are required to comply with the provisions of all applicable aviation legislation, and all associated rules or regulations including the provisions and requirements specified in the different States' Aeronautical Information Publications (AIPs) whose jurisdictions we operate within.

### **0.12.6 Adherence to Operations Manual Suite**

The rules, regulations, procedures and operational instructions contained in the operations manual shall be adhered to by the relevant Pacific Blue personnel at all times. ...

### **3 FLIGHT CREW GENERAL OPERATIONS**

#### **3.1.2 Operating Policy**

(a) ...

(b) It is general Pacific Blue policy to use the aircraft manufacturer procedure wherever practicable. In the case of a discrepancy between documents, the Pacific Blue Manuals take precedence.

(c) ...

(d) All flight crew must adhere to the Standard Operating Procedures (SOPs). However, Pacific Blue recognises that SOPs cannot cater for all situations and hence, in exceptional circumstances, the captain may elect to act as required by the situation. The Pilot-in-Command must thoroughly brief the First Officer when deviating from standard procedures in accordance with the principles of this clause, and submit an Occurrence Report.

...

## **7 BOEING 737 STANDARD OPERATING PROCEDURES**

### **7.1 B737 LIMITATIONS**

#### **7.1.4 Aeroplane Systems**

The dispatch from/to runways less than 45 metres wide is not permitted in case of nose gear, steering inoperative or one thrust reverser inoperative. If an alternate airport is available with a runway at least 45 metres wide, diversion to that alternate shall be performed in case of jammed or restricted flight controls, trailing edge flap asymmetry, leading edge flap/slat asymmetry, single engine inoperative, or loss of system A or B hydraulics.

#### **7.1.8 Company Crosswind Limitations**

Pacific Blue approved crosswind limitations (in kts) are as follows:  
... 30 metre runway width, wet, 16 kts.

### **7.2 B737 NORMAL OPERATING PROCEDURES**

#### **7.2.1 Policy**

(a) ...

(b) In case of a discrepancy between documents, the priorities are as follows:

- Pacific Blue's Volume A1 : *Flight Crew Operating Manual*
- Boeing's B737 *Flight Crew Operations Manual (FCOM)*;
- Boeing's B737 *Flight Crew Training Manual (FCTM)*.

(c) All pilots must adhere to the SOPs. However, the company recognises that SOPs cannot cater for all situations and hence in exceptional circumstances, the Captain may act as required by the situation.

#### **7.2.4 30 m Wide Runway Operations**



- (a) Pacific Blue aircraft, have been issued with an Airplane Flight Manual (AFM) supplement authorising operations to narrow runways, (that is runways of less than 45 m but not less than 30 m in width).
- (b) ...
- (c) Attention is drawn to the following issues:
  - There are specific crosswind limitations for the B737-800 (there are no variations in the crosswind limits because of winglets).

[44] The following extracts are from –

**Pacific Blue  
Operations Manual Suite  
Volume C1 :  
Flight Crew Route Guide**

**3 AIRPORT INFORMATION**

**3.2 New Zealand Airports**

**3-ZQN Queenstown (NZQN)**

**3-ZQN-1 INTRODUCTION**

...

ZQN is classed as a Category X airport for Company operations. ...

**3-ZQN-2 GENERAL INFORMATION**

...

The airport is surrounded by steep ranges and mountain peaks. To the south-southwest 3 km from the airport, Peninsula Hill rises to 2740 ft above mean sea level. To the east and southeast the Remarkable Range rises to over 7600 ft approximately 7 km from the airport. Approximately, 2 to 3 km to the north and northwest of the airport hills rise to 2000 ft with peaks to over 5400 ft further north.

East-northeast of the airport is the Kawarau Gorge and the Crown Range at a distance of 15 km. Consequently, the airport receives considerable orographic sheltering from precipitation and low cloud in all directions except from the south to southwest.

**3-ZQN-5.2 Wind Characteristics**

...

Observations from the several windsocks show little consistency in the direction of the wind on the airport. Experience has shown that the wind at the anemometer is not very representative of the surface wind at other points on the airport.

There is a good sequence of visibility marks at or near the airport and an excellent range of cloud height marks is available from the surrounding terrain.

**3-ZQN-5.3 Turbulence**

...

In strong southwest airstreams frequent turbulence occurs on the approach to the airport from the northeast particularly if the flow is nonlaminar. Down draughts caused by the presence of Peninsula Hill to the south-southwest may be experienced over the Shotover River and on the climb out from the airport.

...

[45] The following extract is from -

**Pacific Blue  
Operations Manual Suite  
Volume C1 :  
Flight Crew Route Guide - Preamble**

**1.1.7 Terminology**

Throughout this manual the three headings, WARNING, CAUTION and NOTE are used. They are used in the following manner:

**WARNING:**

INFORMATION WHICH IF NOT CAREFULLY FOLLOWED MAY RESULT IN PERSONAL INJURY OR LOSS OF LIFE.

**CAUTION:**

INFORMATION WHICH IF NOT CAREFULLY FOLLOWED MAY LEAD TO DAMAGE OR DESTRUCTION OF AIRCRAFT.

**SPECIFIC QUENSTOWN PROCEDURES:**

**3-ZQN-6.2 Light Aircraft**

...

**WARNING:**

**AIRSPACE**

CLASS D AIRSPACE.

NO RADAR COVERAGE.

**OPERATIONAL LIMITATIONS**

DAYLIGHT OPERATIONS ONLY.

ALL TAKE OFFS MUST OCCUR AT LEAST 30 MINUTES PRIOR TO EVENING CIVIL TWILIGHT TO ALLOW FOR VISUAL MANOEUVRING.

...

**ADVERSE CONDITIONS**

SEVERE TURBULENCE, DOWNDRAUGHTS AND WINDSHEAR CAN BE EXPERIENCED WITHIN THE QUENSTOWN BASIN BELOW 4000 FT.

**TERRAIN**

QUEENSTOWN AERODROME IS SURROUNDED BY MOUNTAINOUS TERRAIN. REMARKABLES RANGE TO THE SOUTH-EAST OF THE AERODROME INFRINGES THE CIRCLING AREA. EGPWS ALERTS MAY BE EXPERIENCED DUE TO THE CLOSE PROXIMITY OF HIGH GROUND.

**3-ZQN-7.2 Visibility and Minima Requirements**

The Company requirement is a minimum visibility of 10 km within the Queenstown basin. The IFR take off minima is, therefore, 2300 ft (AGL) and 10 km.

...

**3-ZQN-7.9 Crosswinds Limitation**

Maximum cross wind in dry conditions is 27 kts and 16 kts if the runway is wet.

**3-ZQN-10 DEPARTURES**

Set heading weight and altitude requirements for each SID departure are published in the special takeoff procedure for the appropriate runway for both bleeds on and bleeds off. These weight/altitude requirements must be adhered to as the minimum for IMC entry on departure.

**3-ZQN 10.1 Engine Failure After Take off**

In the event of an engine failure after take off, manoeuvre via the figure 8 special procedure circuit until all of the necessary checklist items are completed. This may require the completion of more than one circuit.

[46] The following extract is from –

**Pacific Blue  
Operations Manual Suite  
Volume C1 : Flight Crew Route Guide**

**ANNEX 3A - ZQN TRAINING PROGRAM**

**3A.1 SIMULATOR TRAINING ...**

**3A.2 AIRCRAFT LINE TRAINING**

- 1 PRE-FLIGHT ...
- 2 ROUTE STRUCTURE AND TERRAIN ...
- 3 WEATHER ...
- 4 ARRIVAL AND LANDING ...
- 5 DEPARTURE

- ...

- Difficulty in assessing weather conditions when on the ground looking up into mixed layers.

- Difficulty of assessing actual airborne visibility in rain conditions.
- No takeoff without clearly having enough visibility to comfortably manoeuvre back to land. (This may sound basic but aircraft must not be forced into a prematurely IMC departure from a difficult position.)
- ...
- Consideration of engine failure after IMC departure and the use of the 080 radial as best option from a low altitude.

#### **4.4.4 Alternate aerodrome**

##### **4.4.4.1 General**

- (a) An Alternate Aerodrome is ‘an aerodrome specified in the flight plan to which a flight may proceed when it becomes impossible or inadvisable to land at the aerodrome of intended landing’.

...

#### **4.5 ALTERNATE AERODROMES POLICY**

##### **4.5.1.2 Pacific Blue B737-800 (26K) Primary Aerodrome – Departure Alternatives**

[47] It is noted that 4.5.1.2 lists the primary aerodrome departure alternative for B737-800 aircraft. At this portion of the document Queenstown is noted as a departure aerodrome and has Christchurch, Dunedin, Invercargill and Wellington as departure alternates; but no aerodrome in New Zealand has Queenstown as a departure alternate.

#### **Pacific Blue Operations Manual Suite**

##### **Volume C7.2 :**

##### **B737-800W Airport Analysis**

#### **ZQN SPECIAL PROCEDURES – QUEENSTOWN (ZQN)**

##### **ZQN-3 ALL ENGINES OPERATING – RWY 23**

##### **BOWEN THREE, BUNGY FOUR and CROWN FOUR**

##### **Departures**

- At shoreline, turn LEFT track 220°M along Frankton Arm;
- Abeam Kelvin Heights (5.0 SH DME), turn LEFT, track via the visual segment for the SID;
- Visual reference must be maintained until reaching the altitude AND fix from table below;
- Commence Flap retraction to achieve a Flap setting not greater than Flap 5 by TOLGE;
- Track 355°M (SH 175°R) from TOLGE toward SH VOR;
- Initiate and contain turn onto specified SID radial within a radius of 2 SH DME;

- Maintain Flap 5 until established outbound from SH VOR.

CAUTION:

MAX. SPEED IN TURNS: 180 KT.

**BOWEN THREE Departure**

Altitude overhead TOLGE (ft QNH) ACCEL ALT 6100 ft QNH

Aircraft Weight (Tonnes)

CONFIG	72.0	70.0	68.0	66.0	64.0	62.0
Bleed ON	4800	4600	4200	3900	3600	3300
Bleed OFF	4800	4500	4200	3800	3500	3200

For Anti-ice Engine Only ADD 300 ft to the above altitudes.

For Anti-ice Engine & Wing ADD 1100 ft to the above altitudes.

Set out below is the chart from the Special Procedures setting out the Figure 8 special procedure. I refer also to Exhibit Folder 2, Tab 33. (Underlining added.)

**Pacific Blue**

**SPECIAL PROCEDURES - QUEENSTOWN (ZQN)**

**ZQN-4**

**ENGINE INOPERATIVE - RWY 23**

If Engine fails prior to TOLGE and/or below Altitude from table.

- After passing shoreline, turn LEFT track 220°M along Frankton Arm;
- Abeam Kelvin Heights (5.0 SH DME), turn LEFT around Deer Park to overhead TOLGE, join the figure 8 as depicted below.

**CAUTION:**

**SPEED & BANK ANGLE LIMITS:**

1. MAX IAS 160 KT WITH 15° ANGLE OF BANK, OR
2. MAX IAS 180 KT WITH 25° ANGLE OF BANK.

- Level off and reduce thrust at 2700 ft QNH.

If Engine fails after TOLGE:

- Set MCT and continue tracking via SID;
- Initiate and contain turn onto specified SID radial within a radius of 2 SH DME;
- Established outbound on specified SID radial and at or above the acceleration altitude (ACCEL ALT) specified on the table, accelerate retract flaps on schedule;
- Climb to MSA at flaps up speed.

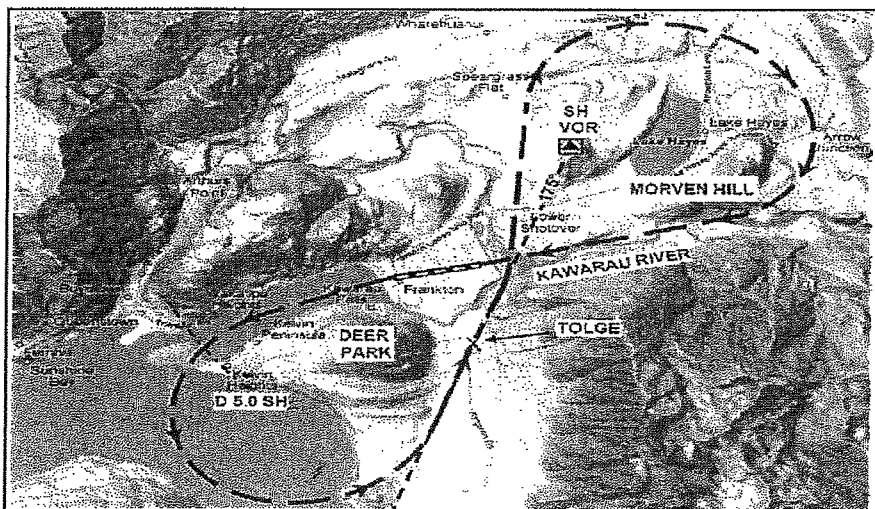


FIGURE 8 - RWY 23.pdf

[48] The following extracts are from :

**Boeing Flight Crew Operations Manual Virgin Blue/Pacific Blue**

<b>Preface</b>	<b>Chapter 0</b>
<b>Introduction</b>	<b>Section 2</b>
<b>General</b>	

This Flight Crew Operations Manual (FCOM) has been prepared by The Boeing Company. The purpose of this manual is to:

- provide the necessary operating limitations, procedures, performance, and systems information the flight crew needs to safely and efficiently operate the 737 airplane during all anticipated airline operations.

...

<b>Limitations</b>	<b>Chapter L</b>
<b>Operating Limitations</b>	<b>Section 10</b>

Narrow Runway (less than 45m) Operation the document states:

...

If an alternate airport is available with a runway at least 45-meters wide, diversion to that alternate shall be performed in case of jammed or restricted flight controls, trailing edge flap asymmetry, leading edge flap/slat asymmetry, single engine inoperative or loss of system A or B hydraulics.

[49] 7.1.4 of these Standard Operating Procedures already detailed is much to the same intent and purpose for the Pacific Blue Operations Manual.

<b>Supplementary Procedures</b>	<b>Chapter SP</b>
<b>Cold Weather Operations</b>	

...

Icing conditions exist when OAT (on the ground) or TAT (in flight) is 10°C or below and any of the following exist:

- visible moisture (clouds, fog with visibility of one statute mile (1600m) or less, rain, snow, sleet, ice crystals, and so on) is present,  
or
- ice, snow, slush or standing water is present on the ramps, taxiways or runways.  
**CAUTION: Do not use engine or wing anti-ice when OAT (on the ground) or TAT (in flight) is above 10°C.**

[50] At page SP.16.4:

**Engine anti ice operation on the ground**

Engine anti ice must be selected ON immediately after both engines are started and remain on during all ground operations when icing conditions exist or anticipated.

**WARNING:** Do not rely on airframe visual icing cues before activating engine anti-ice. Use the temperature and visible moisture criteria because late activation of engine anti-ice may allow excessive ingestion of ice and result in engine damage or failure.

**CAUTION:** Do not use engine anti-ice when OAT is above 10°C.

[51] At page SP.16.5:

### **Wing Anti-ice Operation – On the Ground**

Use wing anti ice during all ground operations between engine start and takeoff when icing conditions exist or anticipated unless the airplane is, or will be protected by the application of Type II or Type IV fluid in compliance with approved ground de-icing programme.

**WARNING:** Do not use wing anti-ice as an alternative for ground de-icing/anti-icing. Close inspection is still needed to ensure that no frost, snow or ice is adhering to the wing, leading edge devices, stabilizer, control surfaces or other critical airplane components at take off.

**CAUTION:** Do not use wing anti ice when OAT is above 10°C.

[52] At page SP.16.9:

### **Engine Anti-Ice Operation - In Flight**

Engine anti-ice must be ON during all flight operations when icing conditions exist or are anticipated, except during climb and cruise when temperature is below -40°C SAT. Engine anti-ice must be ON before, and during descent in all icing condition, including temperatures below -40°C SAT.

When operating in areas of possible icing, activate engine anti-ice before entering icing conditions.

[53] **Manual of Air Traffic Services (Exhibit 5)**

21.1 ...

*An ATC clearance does not absolve the pilot from compliance with Civil Aviation rules or any procedures established for ensuring the safety of flight or for any other purpose.*

...

**6 WIND**

## 6.1 PERIOD OF OBSERVATION

Wind direction and speed shall be averaged over a two minute period for reports for take-off and over a ten minute period for reports disseminated beyond the aerodrome such as METAR and VOLMET.

Instantaneous wind values or averages over a lesser period should be used when the two or ten minute average would give a false impression, such as following a marked wind change.

Gusts shall be reported where the wind speed rises momentarily to a value 10 kt or more above the mean speed.

Lulls shall be reported where the wind speed decreases momentarily to a value 10 kt or more below the mean speed, and are normally accompanied by the maximum speed attained. Lulls are not reported in METAR or SPECI reports.

## 6.2 WIND DIRECTION

The wind direction in take-off and landing reports and in ATIS broadcasts shall be given in degrees magnetic.

...

## 6.4 MULTIPLE ANEMOMETERS

Where more than one anemometer is installed readings from the anemometer located nearest to the lift-off or touchdown point (primary), as appropriate, shall be used.

When the readings from another anemometer (secondary) indicate:

a "variation" between the readings of 30 degrees or more in direction and/or 10 kt or more in speed, or

the direction of take-off or landing has downward component, -

readings from both anemometers shall be passed to the aircraft.

Readings from both anemometers shall be passed when requested by a pilot.

Supplementary information from the secondary anemometer shall be identified. e.g. "WIND NORTHERN END ..... (etc)".



## **The duty on the PIC to comply with the Exposition**

[54] The informant alleges as part of its case against the defendant that he decided to take the aircraft off the Queenstown airport when the cross wind limitation of 16 kts on a wet runway could not be met.

[55] The “Flight Crew Route Guide” at p 3-ZQN-7 (Exhibit Folder 3 : Tab 2) states:

### **3-ZQN-7.9 Crosswind Limitation**

Maximum cross wind in dry conditions is 27 kts and 16 kts if the runway is wet.

[56] Paragraph 3-ZQN-7 of the “Flight Crew Route Guide” is headed “Operating Requirements”. The other sub-paragraphs provide strict controls in relation to fuel, visibility and minima requirements; landings and take offs are “...limited to Captains only..”; a requirement that retardation devices must all be serviceable; speed limitations and similar such matters relating to Queenstown’s operation.

[57] There is no issue that on the day in question the Queenstown runway was wet. The CCTV footage clearly establishes that as a fact to my satisfaction.

[58] The defence expert witness, Captain Julian, when being questioned by Mr Pilditch about the cross wind limit, suggested that the Exposition was there for “...use and guidance...” (as he put it). Although he would expect a pilot to obey and follow that 16 kt limitation as it was part of the Exposition it was therefore for “...use and guidance in accordance with the Exposition title ..”.

[59] The starting point in having regard to this issue is to refer to section 12 of CAA 1990:

12(1) Every person who does anything for which an aviation document is required (in the succeeding provision of this section called a participant) shall ensure that the appropriate aviation documents and all the necessary qualifications and other documents are held by that person.

12(2) Each participant shall comply with this Act, the relevant Rules made under this Act, and the conditions attached to the relevant aviation documents.

12(3) Every participant shall ensure that the activities or functions for which the aviation document has been granted are carried out by the participant, and by all persons for whom the participant is responsible, safely and in accordance with the relevant prescribed safety standards and practices.

12(4) Every participant who holds an aviation document that authorises a provision of a service within the Civil Aviation system –

- (a) shall, if so required by rules made under this Act, establish and follow a management system that will ensure compliance with the relevant prescribed safety standard and the conditions attached to the document; and
- (b) shall provide training and supervision to all employees of the participant who are engaged in doing anything to which the document relates, so as to maintain compliance with the relevant prescribed safety standards and the conditions attached to the document and to promote safety; and
- (c) shall provide sufficient resources to ensure compliance with the relevant prescribed safety standards and the conditions attached to the document.

(The underlining emphasis is mine)

[60] Section 13 of the CAA sets out the duties of PIC.

13 The Pilot in Command of an aircraft shall –

- (a) be responsible for the safe operation of the aircraft in flight, the safety and well-being of all passengers and crew, and the safety of cargo carried; and
- (b) have final authority to control the aircraft while in command and for the maintenance of discipline by all persons onboard; and
- (c) subject to section 13(A) of this Act be responsible for compliance with all relevant requirements of this Act and regulation and rules made under this Act.

[61] On 23 January 2009 Pacific Blue Airlines (NZ) Limited were granted an Airline Air Operator Certificate. That Certificate (see tab 28 Volume 2 of Exhibits) certified that the company, Pacific Blue Airlines (NZ) Limited trading as Pacific

Blue was authorised under the provisions of CAR Part 119 to perform air operations and other associated activities in accordance with CAR Part 121 as defined “...in the Operation Specifications and the organisation’s Exposition...”

[62] The “Operation Specifications” document for Pacific Blue Airlines (NZ) Limited (tab 29, Volume 2 of the Exhibits bundle) specifically refers to the Exposition and notes at page 7 under “RNAV (RNP0.3 Approval)” paragraph 1 that:

All operations will be conducted in accordance with the Pacific Blue Exposition.

At the beginning of the “Operators Specifications” there is recorded in respect of that document:

It also references the operator’s Exposition policies, procedures and other details as accepted and held by the Directors. Any changes to these details require prior acceptance by the Director. (ref CAR 119.165)

[63] The CARs have their genesis in CAA 1990 (Part 3). The CARs are quite clearly rules representing minimum standards of safety. I accept the submission made on behalf of the informant that CARs 121.7 and 121.153 are of major significance to the issues raised in this case.

[64] CAR 121.7 states:

#### Procedure compliance

Each person performing an air operation shall conform with the applicable procedure specified in the exposition of the holder of an air operator certificate that authorises the operation.

[65] CAR 121.153 states:

#### Meteorological Information

- (a) A person performing an air operation must plan, perform and control a flight using meteorological information provided for aviation purposes by
  - (i) Subject to paragraph (b) for a flight sector originating within New Zealand, the holder of an aviation meteorological service organisation certificate issued in accordance with Part 174.

...

[66] There is no issue in this case that the Queenstown ATC was the body charged with providing meteorological information to PBN89.

[67] It is a plank of the defence argument that the status of the Exposition is to do no more than detail directions, policies and procedures for the “use and guidance” of flight and cabin crew in performing their duties and that the provisions of CAR 121.7 is not in prescriptive language because the terms “...must comply..” are not used.

[68] The argument raised by the defence is that the PIC is the person responsible for ensuring the safe operation of the aircraft. To that end the meaning of the word “conform” is a lesser requirement than the word “comply”.

[69] The Concise Oxford Dictionary (Eleventh Edition) defines the word ‘conform’ as (inter alia) to “comply with rules, standards or laws”. The same dictionary defines the word ‘comply’ as “act in accordance with a wish or command”. I find that in reality there is very little significance and no real difference in the terminology employed and hold against the argument put by the defendant.

[70] CAR 121.7 requires a person performing an air operation to carry out such operations in accordance with the applicable procedure specified in the Exposition. The insertion of the word “shall” before the word “conform” in CAR 121.7 reflects the mandatory nature of the requirement. I hold that CAR Part 121.7 requires strict compliance with the applicable procedures of the Exposition when performing an air operation.

[71] In relation to CAR 121.153, “meteorological information”, I find that the use of the word “...must..” puts a mandatory requirement on the person planning, performing and controlling a flight. In this case the defendant was PIC. That mandatory obligation relates to the planning, performance and control of a flight. It is in respect of the use by him of meteorological information provided by the certified aviation meteorological service, in this case the ATC at Queenstown.

[72] The defence, at paragraph 6.10 of Mr Muir's closing submissions, argued that the word "use" in this CAR means that the PIC is required to do no more than to take such meteorological information into account. It is the submission by the defendant that to put any higher duty on the PIC would be to "trespass" upon the PIC's ultimate judgment.

[73] The defence argues that the word "use" simply means to take into account. Again I refer to the Concise Oxford Dictionary (Eleventh Edition). In respect of the word "use" the definition is: "...take, hold, or deploy as a means of achieving something; treat in a particular way; the action of using or state of being used..." I do not accept that the word "using" means "...take into account..." It is my view that it clearly means a positive act of taking, holding or treating something.

[74] Mr Muir at paragraph 5.22 of his closing submission discussed the comments of the Regulations Review Committee at the time when it was considering proposed amendments to the then Civil Aviation Regulations 1953. The committee were considering a proposal that prohibited a pilot from using metrological information from anyone who was not approved. The committee considered the proposed wording would have restricted the ability of any pilot to have regard to his or her own observations, or any other information available. At paragraph 6.21 of its report the committee made its recommendation in terms of an amendment placing a "...positive onus on persons planning conducting or controlling a flight..." to use metrological information. I accept the submission of the informant at paragraph 5.22 of Mr Pilditch's closing submissions. The terminology, "positive onus" does not in my considered opinion allow the rejection or ignoring of such information. In any event, both time and methods of compliance have moved on since this Committee's report was issued in the early 1990s. The Civil Aviation Rules Part 121 first came into force on 14 November 1995 and CAR 121-153 in its present form was part of CAR part 21 amendment 17 of 25 October 2—7. Indeed I find that Mr Muir's submissions as per paragraph 5.23 of his closing submissions is directly in opposition to the clear wording of section 12(4) of CAA 1990.

[75] Section 13 CAA 1990 must be considered. The defendant as PIC was responsible for the safe operation of the aircraft in flight; had final authority to

control the aircraft while in command; was further responsible for compliance with all “relevant requirements”, regulations and rules made under CAA 1990. Each of these responsibilities are conjunctive in my view and must be read together. While the defendant had “control” of the aircraft and responsibility for the safe operation, he had to do so in my considered opinion in accordance with the requirements of CAA 1990 and the CARs and that this included strict compliance with the Exposition.

[76] I have had regard to the expert evidence given at trial. I note the closing submissions from the informant at paragraph 5.24 and the quote contained therein from Mr Hughes:

Pilots have bounds to the discretion that they can exercise.

[77] I consider, as a matter of commonsense, that must be so. I find that a PIC does not have an absolute decision-making power. A PIC must at all times act in accordance with each of the sub-paragraphs set out in section 13 CAA 1990.

[78] A number of experts were called on behalf of both the informant and the defendant during the course of the hearing. All experts provided detailed opinion evidence about aspects of the Exposition and issues arising from the flight of PBN89. This evidence has been fully considered by me and taken into account throughout my decision-making on the issues. Some of the experts appeared to me to be taking a position of subjective support of the party for which they were giving evidence. Overall, allowing for that factor, consideration by me of the issues and my decision on those issues has been assisted by the experts’ evidence in chief and the testing of that evidence under cross-examination. I have critically assessed the amount of weight I gave to each expert’s evidence and opinion.

### **Informant Experts**

*Geoffrey Thomas Lowe*

[79] Mr Lowe was called on behalf of the informant. In the past he has been the flight operations manager for PB and its predecessor. He is currently employed in a

senior competency assessment position with the airline. He clearly has a vast knowledge of the way in which the PB Exposition has been formulated and put together and gave evidence interpreting various provisions of it. I found Mr Lowe to be a credible and reliable witness and his evidence was helpful to my decision-making process. Mr Lowe's opinion was unequivocal that the Exposition required a pilot departing from Queenstown to use the departure procedures set out for Queenstown. That is, if there was an engine failure prior to Tollgate (TOLGE) then to enter into the Figure 8 circuit. His evidence was that the Exposition did not contemplate nor permit a pilot to continue on a SID if there was an engine failure prior to Tollgate. Despite close and persistent questioning from Mr Muir, Mr Lowe did not at any stage move from that position.

[80] His evidence was that in order to comply with CAR Part 121 PB did a detailed examination of the procedures required so as to ensure safe operation into the Queenstown airport. This detailed examination included engine failure procedures. The process then required the use of a Boeing Climb Out Performance Tool programme which allowed performance calculations to achieve obstacle clearances. Mr Lowe's evidence was that there was a conscious decision that the Figure 8 option was the safest option. Mr Lowe was clear on his evidence that there was no performance data in the Exposition which would allow the crew to determine how to achieve obstacle clearance requirements in other ways.

[81] Mr Lowe's evidence was of a detailed training programme in relation to pilots controlling aircraft coming into and taking off out of Queenstown. He was emphatic that pilots had never been trained to continue on SID if there was an engine failure prior to TOLGE, albeit that there was the Bungy Four departure available. That departure process had to be decided upon by the PIC prior to departure. It was not a process where there could be a diversion to Bungy Four on an engine failure occurring prior to Tollgate.

[82] Mr Lowe's evidence was that there was no difficulty in the interpretation of the Exposition; no ability to misunderstand the position of PB in its Exposition; or possibility of one rule overriding another in the way in which the defendant's case, upon his contingency, was premised. An alternate airport only became available for

use upon the aircraft having reached Tollgate (TOLGE). Prior to Tollgate (TOLGE) if there was an engine failure then there was to be a return to Queenstown. The simple logic put by Mr Lowe was that the aircraft crew could not be assured at that point that obstacle clearance would be achieved. I found these premises to be both logical and consistent.

[83] Of some importance to me was that Mr Lowe said that the 'alternate' as contained in the Boeing documentation was in Boeing's view for use enroute only. He informed the Court that there was no PB record that of the defendant, Mr Gunn, had ever raised this "alternate" issue with management prior to 22 June 2010.

[84] In summary, Mr Lowe said that PB had made a thorough safety risk assessment in preparing its Exposition, including issues arising to engine out procedure and had carefully designed a specific procedure in relation to Queenstown and the use of a Figure 8 procedure if there was an engine out prior to achieving the height at TOLGE.

[85] Mr Lowe's position in relation to the various manuals of the Exposition was that the PAC (Pacific Blue Management Manual) was the "top manual". All other manuals were equal.

[86] In detailing the training involved of pilots for the Queenstown operation, the pilots had to first study a computer based training programme, followed by an examination on that programme. Before passing on to the next step the pilot had to pass that examination. The pilot then moved to simulator training which included training on the Figure 8 full IMC engine out procedures. Again a pass in testing was required before the next step. Mr Lowe's evidence was that pilots who failed to pass either the examination or simulator training were given a further opportunity. If the pilot failed again any privileges in relation to flying into Queenstown were removed until a pass had been obtained. Following a pass through the simulator training programme the pilot was then part of a line training programme.

[87] Mr Lowe confirmed that PB had a supplement from Boeing on narrow runways - the permission to operate in and out of Queenstown. He noted that the



provision in the Exposition by PB in relation to ECT was to ensure the pilot would have significant amounts of light and time to return using the Figure 8 programme. Mr Lowe's evidence was that if a pilot on the ground had decided he was not coming back to Queenstown then that pilot should not depart Queenstown.

[88] Mr Lowe's evidence overall greatly assisted me in my understanding and decision in relation to the terms of, and the importance of, the Exposition's requirements overall.

*Colin Raymond Glasgow*

[89] Captain Glasgow gave evidence for the informant. He had a vast amount of flying experience involving some 22,500 hours. He was an experienced large jet pilot who had retired following holding senior positions at Air New Zealand. He was now working for the informant. I took due note of that fact. However, I found Captain Glasgow's evidence to be logical and readily understandable. It was, on my finding, consistent. Aviation safety was premised by him on the basis of the "...worst thing happening at the worst time..". Queenstown, because of its inherent difficulties, required special training; Tollgate is described by him as a point of 'no return' where up to then the Exposition required a return to the Queenstown airport, but after that position had been reached an alternate airport had to be used. Captain Glasgow noted that Pacific Blue in its Exposition had increased the NZAIP requirements.

[90] In respect of ECT Captain Glasgow emphasised the wording "...at least". He was of the opinion that the PIC had to ensure that the general weather conditions (the cloud, rain and wind) would, even in the circumstances of a departure prior to the ECT limitation, allow the aircraft to be returned to Queenstown prior to ECT if there was an engine failure.

[91] Captain Glasgow noted the part of the Exposition as to Queenstown's gusty wind conditions. His opinion was that the cross-winds at the time of the departure of PBN89 exceeded the airport minima. That fact, coupled with low light and a narrow

runway, highlighted the difficulties in relation to the departure (which required, in an IFR departure, the VFR segment until Tollgate).

[92] Captain Glasgow discussed the significant wind gusting in the Queenstown environment. He emphasised that windsocks were difficult to use to assess wind velocity, accepting that the windsocks can clearly show gustiness and direction of wind. It was his opinion that obtaining velocity levels from the use of a windsock was difficult. I find that is a commonsense approach to the value of windsocks overall.

[93] Captain Glasgow's view of the Exposition was that it gave a structured and detailed process in relation to Queenstown. He noted that as a Category X airport Queenstown was a difficult area in which to properly assess winds. Captain Glasgow disagreed with the defendant's expert, Captain Julian, that the last wind report given to PBN89 was a "favourable wind report". To Captain Glasgow the report was showing considerable gusts.

[94] Captain Glasgow's opinion was that the requirement on a pilot from the Exposition was that if there was an 'engine out' prior to Tollgate the aircraft had to return to Queenstown as Queenstown was the only alternate because Christchurch would not be available, Christchurch only becoming available when Tollgate was reached. Captain Glasgow was adamant that a pilot was not free to adopt his own departure process.

[95] Captain Glasgow was closely examined by Mr Muir on behalf of the defendant. Captain Glasgow was clear in his opinion that the situation as it pertained on the day in question was not an 'emergency' situation.

- That the Figure 8 was the approved procedure to return. If the defendant had difficulty with this process he certainly had not raised the issue on any prior occasion. Captain Glasgow said that the PIC had no performance calculator, nor did he have supporting data with which to make his decision. He noted that the PIC was acting on assumptions in relation to the weather that he could not see behind Deer Park; had to level off in order that he could

maintain visual contact; had to descend over terrain and/or the lake in order to maintain visual contact. These two actions being required because of the weather conditions.

- Captain Glasgow's position was that he would have only taken the aircraft off from Queenstown if he was totally assured that he could fly the Figure 8 in order, that he could put the aircraft back on the ground if there was an engine problem prior to Tollgate.
- Captain Glasgow was critical not only of the assumptions made by the defendant on the day but the assumptions he says Captain Julian (defence expert) made. He saw the defendant's position as that the aircraft would be flown absolutely perfectly from V1 to Tollgate and that there had been no allowance made for "startle factors" such as those that did occur, nor allowances for such things as turbulence in his calculations.
- Captain Glasgow took issue with Captain Julian's view that the statement within the Exposition on ECT as to "...visual manoeuvring..." was a "conditional" statement. He saw it simply as a commonsense matter as visual manoeuvring would be required if one had to return to land following a difficulty with the engine prior to Tollgate. Captain Glasgow described the ECT requirement as meeting the intent that the aircraft would be back on the ground with adequate daylight remaining. I find that this is a commonsense and acceptable explanation in relation to the ECT requirement.

[96] On wing anti-ice, Captain Glasgow considered the ground conditions that existed at the time of planning the take off. In his view any aircraft "susceptibility to icing" had to be given little weight. The aircraft was no different to any other aircraft. (Captain Glasgow accepting that jet aircraft spend small amounts of time in the air where icing is likely to form.) The aircraft has the ability for the use of engine and wing anti-ice and de-icing capabilities. Captain Glasgow took into account the Queenstown environment and the prevailing weather conditions in his opinion that it would have been appropriate to consider making an allowance for the use of wing anti-ice. In the end, Captain Glasgow put it in this way (NOE 743/25):

...if you were not going to consider using wing anti-ice during the climb in the event of an engine failure, I haven't any idea what circumstances you would consider using wing anti-ice or making provision for it.

[97] He had noted in his evidence (NOE 740/7) that at the time there was 3° air temperature, rain, visible moisture, lots of thick cloud, cold frontal activity in the area, and, in the plane's need to take into account the necessity of the aircraft reaching 9800 ft.

[98] Captain Glasgow's evidence was that the PIC can bring his own assessment in, together with all the other information, but if the departure minima upon the PIC's assessment was different to what the PIC was being told, then he would need to talk to the ATC about it.

[99] In relation to the "don't sink", the "bank angle" alert, and the "speed" call, Captain Glasgow noted that one had to take into account the overall circumstances when assessing the importance of these events, ie that the aircraft was above water in poor light at a low altitude. In those circumstances the combination of those alerts and calls were "startle factors" which had to be assessed, on Captain Glasgow's evidence, as having occurred by the fact of the take off occurring in the existing conditions and at the time it did. The aircraft was close to land and water in poor weather and low light.

[100] Captain Glasgow discussed in respect of wind gusts an issue that would have arisen if there had been an engine out prior to reaching V1 and the take off accordingly aborted, as the aircraft then would have been subject not only to the thrust on one engine and no thrust on another, but also to gusts running the full length of the runway.

[101] In the course of the cross-examination Captain Glasgow's independence was questioned. In assessing the use that I give to his evidence, I have taken the fact that he is employed by CAA into account. But overall I consider his evidence to be of a kind in which he was at all times being objective in his views in respect of the operation of the aircraft by the defendant on this particular day.

*Mark Hughes*

[102] Mark Hughes is the General Manager (Airlines) for CAA. He has extensive flying experience. He has experience in working with CAA since 2008. Prior to that, he worked in Canada for an airline handling a number of large jet aircraft. He has formal training in safety management and risk management systems together with involvement in aviation accident safety investigation; training as a safety officer; and with training as an instructor and flight examiner. He has flown into Queenstown in observer seats of jet aircraft. I note the criticisms made by the defence of Mr Hughes as an employee of CAA in relation to his giving expert evidence. I note that he has not flown 737-800 aircraft. However, he is also a person familiar with the Queenstown operation. His background, particularly in relation to control of airline operations and safety management systems, means that his evidence overall was extremely helpful to me. Despite an extensive and rigorous cross-examination I found Mr Hughes to be both credible and reliable. I have placed weight on his evidence in making the assessments that I do later in this judgment.

[103] Mr Hughes discussed in evidence the nature of the Queenstown operating conditions, the category of the Queenstown airport, the requirement for crew training, and that the operators expect their pilots to comply with the documented landing and take off procedures contained in the Expositions. The nature of Queenstown, the high terrain, the cloud, turbulence and similar such factors require a pilot, in Mr Hughes' view, to ensure that the fundamental minimum standards of safety are complied with. He said that in any flying there has to be minimum standards of safety but commercial operations have a higher standard of safety than private operations. Mr Hughes discussed the various CARs, the Exposition and the Bowen Three procedures. Overall his evidence was that visibility was critical, should any emergency occur, to the management of such emergency. He noted the warnings in the Exposition.

[104] Mr Hughes noted the PBN89 take off within the 30 minute restricted ECT period; in weather conditions of low overcast cloud with precipitation and low light, reported cross wind and gusts. The take off, in his view, was in breach of the NZAIP minima for Queenstown of 2300 ft and thus in breach of CAR 91.413(f). He noted

the Bowen Three departure procedure; the surrounding terrain; the height requirement of 2600 ft AGL; the weather reported by ATC which was such that there had to be a levelling off of the aircraft at 1000 ft AGL followed by a descent of 300 ft because of the duty to remain below the cloud; there were then alerts and advices given to the PIC which indicated to Mr Hughes the difficulties with this take off. His evidence was that the PIC had to consider the narrow runway, which did not have landing lights; the mountainous terrain; the levels of cross wind being reported; and the risk of a runway excursion. All this taken together meant Mr Hughes was of the opinion there was a clear elevation of risk and an invasion into safety, ie the safety margins were degraded. In Mr Hughes' view no allowance seems to have been made for any compromise of performance as a result of the conditions.

[105] Mr Hughes discussed "flight into terrain" with low light and close terrain of a mountainous kind; the "surprise" factor; the alerts, calls and warnings; changes in thrust; an inability to put the autopilot into effect; and turbulence in the general meteorological conditions. Mr Hughes was firm in his opinion that a PIC is not able to ignore the operator's detailed procedures. He summed up the defendant's contingency as a contingency based on self-justification for what the defendant had in fact done.

[106] Mr Muir rigorously tested Mr Hughes. Mr Hughes repeated that the training of crew established that the Figure 8 procedures were not only assessed as being fit for their purpose but were clearly achievable. Mr Muir's questioning on what other airlines provided was answered by Mr Hughes' opinion that the operators had RNP-AR operations and that therefore there was no need for extensive visual manoeuvring. Mr Hughes was adamant that the engine failure procedures prior to Tollgate had been "designed" and "developed" and that it was not something come up with by a pilot "on the spur of the moment". Mr Hughes noted the chart used by the defendant as part of his overall preparation of his contingency was not a document designed for the purpose it was being used for. Mr Hughes said that such steps could not be based on guesswork, but had to be based on proper performance calculations.

[107] Mr Hughes' interpretation of the evidence was that it was close to dark. When the two different requirements in the Exposition as to alternates were put to him, he described that as one being generic or general and the other being detailed and specific and that the PIC was required to follow the detailed and specific requirement in the Exposition. Mr Muir put criticisms of the ATIS report to Mr Hughes. His evidence was that a pilot needed to be absolutely satisfied that weather requirements were met before taking off. Any differences of a serious kind needed to be reconciled, not ignored, as prudence dictated a conservative approach.

[108] In my view Mr Hughes' position makes clear sense in that:

- i. a PIC should check all meteorological information and make a considered assessment and judgment using all available information;
- ii. he should only operate or initiate departure when the standard take off minima have been established to his full satisfaction;
- iii. that meteorological reports must be used when planning the flight.

[109] Mr Hughes' evidence in relation to wing anti-ice was that there was a requirement to plan for its use if conditions suggested ice might be a difficulty. He made the point that why would wing anti-ice be included in the Exposition's calculations as a correction if such wing anti-ice was never needed to be used? In relation to the light weight of the aircraft Mr Hughes was somewhat sceptical about what could be allowed for in that regard but held the opinion that any perceived form of benefit cannot be based on guesswork. The fact that the aircraft was light did not mean that a different contingency plan could be put in place by the pilot. The plane being "light" did not mean in Mr Hughes' opinion that the operator's directions as detailed in the Exposition must not be given regard to. I accept Mr Hughes' position on this issue.

[110] In relation to the cross wind issue, Mr Hughes noted that 5:25 pm was the critical time. His opinion was that the evidence at that time was that there was a cross wind value of 19 kts from two independent sources; that cross wind value must

be assessed taking into account the gusts that were being reported. If there was a rejected take off prior to V1 the resulting use of the whole runway would mean that gusts at the other end of the runway were also vital components of the planning, particularly taking into account the circumstances of zero thrust on one engine with full thrust on the other if such a circumstance occurred.

[111] Mr Hughes did not accept the windsock as a particularly accurate base for calculating velocity of wind. As to the Boeing material, Mr Hughes remarked that the circumstances at Queenstown on the day in question were somewhat different from a test pilot in an ideal situation and conditions with all other advantages. Mr Hughes said that Boeing guidance was for operators, with the operators making their decisions in the Exposition detail accordingly. Again I agree with that opinion. Mr Hughes described this as a non-standard departure as normally the PB Exposition would require 1000 ft and acceleration in the rate of climb. He considered that against an altitude loss from 1000 ft down to 700 ft – a loss of approximately one third. His opinion was that the defendant's assumptions upon analysis were either incorrect or guesswork and not reasonable when there was cloud at 1500 ft in the airport area, lower levels of cloud being reported in the Frankton Arm, and with the other weather conditions pertaining, a person such as the defendant could not be confident that the conditions would improve behind Deer Park Heights, which was part of the overall requirement to be visual.

### **Defence Experts**

#### *Frederick James Douglas*

[112] Captain Douglas's background experience clearly established him as having considerable flying expertise. He has over 12,000 flying hours and has flown a large number of aircraft including Boeing 747-200 when he was flying with Air New Zealand. He had held a position of Flight Operations Manager for Air New Zealand from 1991 to 1998 and held other positions in air transport. He was, as the Flight Operations Manager, a person who had to ensure that that airline acted in accordance with the requirements of the Exposition and thus audited compliance with safety



standards and had, as one of his tasks, to identify areas where improvements were required.

[113] However, his evidence as a whole when I consider it as it was given in Court and from re-reading the NOE, brought his objectivity and independence as an expert strongly into question. His evidence included a suggestion that he had, as part of his preparation, interviewed the defendant rather than using a brief of the defendant's evidence or what the defendant said in Court. His evidence in relation to his interpretation of the CCTV footage is not in accordance with my own view of that footage. As a result of his evidence in Court and my re-reading of it, I again considered that footage. The CCTV footage established to my satisfaction that, contrary to what Captain Douglas had said, there was not good visibility in the area of the Remarkables at the times he stated. My view of the CCTV tapes shows that there was low cloud in that valley. Particularly at 17:10:25 one can see the cloud low down on the Remarkables; at 17:12:03 the cloud remains low on the Remarkables but had risen somewhat up the foothills by 17:12:36; at 17:15:41 the cloud is just above the foothills on the Remarkables but one can only see into the start of the valley; at 17:16:25 the cloud remains low in the valley and on the foothills of the Remarkables other than at their westerly commencement. When I observed the CCTV tape at 17:18:22 and consider the view towards Slope Hill, the cloud cover is low, backgrounds are indistinct. I do not accept that Captain Douglas's evidence on the cloud height is correct. That has a 'flow on' effect on my view of his evidence. I make findings in relation to the evidence given to the Court by Messrs Glass and Wales later in my judgment. I do not consider that those witnesses' evidence is evidence that I could rely on to the extent that Captain Douglas does, ie as a base for establishing a certain view of the cloud cover. Captain Douglas's evidence is against my finding that a pilot is bound by the terms of the reported meteorological conditions, ie, his interpretation of CAR 121.157 is in conflict with my own view.

[114] His view of the requirements of the Exposition as against the contingency drawn up by the defendant (which in his evidence was "...legal, safe and simple") brought his objectivity into issue when my examination of the provisions of the

Exposition and the contingency and the other expert evidence that I do accept would indicate that he is patently incorrect.

[115] Some further observations made by Captain Douglas which have concerned me in relation to his objectivity include:

- i. Where he told the Court that the maximum exposure of the aircraft to icing conditions prior to obstacle clearance would have been 45 minutes and that if there were such icing conditions then the level of ice secretion and such at the short period of time would not degrade the performance significantly. He gave no empirical or research finding basis for that particular observation other than later in his evidence suggesting that although the outside and ground conditions indicated icing potential, he would not plan to use wing anti-ice because he never had experienced such icing - that is, that he had never had ice form on wings of aircraft he was piloting on take off, and that he held the view that jet aircraft of this kind did not accumulate wing ice. He gave no basis other than his own experience for this opinion. The fact that he would not plan to use wing anti-ice because he had never had such icing, ie that he had closed his mind to the issue, is in my view somewhat alarming.
- ii. Captain Douglas, in relation to the area of cross wind, made a statement in his brief of evidence that even if the cross wind on take off was slightly above limitation, there was no element of risk imposed particularly having regard to "...the experience of the Captain". That comment establishes in my mind a very short-sighted and subjective assessment of a critical issue.
- iii. Captain Douglas considered the defendant's assessment of the position of cloud behind Peninsula Hill/Deer Park to be both reasonable and professional. He said it was also prudent upon the basis that the Bowen Three departure procedures were being used; the procedures contained therein were reasonable and prudent; and a pilot therefore is entitled and, in fact, would be expected to depart in the conditions when unable to determine the cloud height below or beyond Peninsula Hill. That, of course, belies the real question that Captain Douglas should have answered, but simply to say

that a pilot can take off without making some form of objective determination as to the cloud height below or beyond Peninsula Hill is again alarming.

- iv. Captain Douglas gave opinion evidence that the windsock was a superior means of establishing trends in wind directions, wind gustiness, or wind lulls than the Vaisala equipment (which of course is calibrated and entirely objective). Such an opinion is in my view, again, most surprising and alarming.

[116] I find I do not accept Captain Douglas's evidence as regards to the lawfulness of the defendant's contingency, nor Captain Douglas's interpretation of the Exposition as rules but not requirements. In all I found his evidence confusing, surprising and alarming and not what I would have expected from an expert giving evidence in an objective manner on the issues that I am confronted with. I found his evidence to be of little, if any, true assistance to me.

*Allan Maxwell Moselen*

[117] Mr Moselen is a safety investigator with the CAA and his title is Acting Manager, Safety Investigations Unit. He appeared for the defence under a witness summons. That was in relation to a report he had prepared dated 27 October 2011 in relation to a flight of a PB aircraft from Queenstown on 13 July 2011. The report contained a discussion in relation to the various departure procedures detailed in the Exposition, and his view in relation to the Figure 8 requirement on return to land at Queenstown. The circumstances of the departure of the aircraft on 13 July 2011 were different from those pertaining at the time of the defendant's flight; there had been an Occurrence Report filed in terms of the CARs. The aircraft had encountered reduced visibility and the pilot decided to climb via the clearance that the aircraft had received, being the Bowen Three departure. The investigation identified a safety risk in relation to non-RNPAR transport operations in Queenstown. The report was prepared on that basis. The report found that the Bowen Three departure was inadequate in its design in relation to obstacles and particularly in relation to the Peninsula Hill/Deer Park Heights position. Further, the report said that the aircraft themselves may not be suitable for non-REMPAR operations at Queenstown and that

the requirement for flying the Figure 8 circuit is at variance to the NZAIP. In the end the requirement or recommendation was that all jet transport operations should be RNPAR. This was a report in relation to an incident on 13 July 2011. The matters I have to decide upon relate to 22 June 2010. I have read Mr Moselen's report but find that it does not particularly assist me in the matters I am required to find in relation to the specific departure that I am considering. The pilot of the aircraft on 13 July 2011 had weather information above all minima he needed but he could not see behind Deer Park Heights and he got into difficulties behind Deer Park Heights.

*Stewart George Graham Julian*

[118] Captain Julian was called on behalf of the defendant. Captain Julian is an experienced commercial pilot; an Air New Zealand captain; approximately 13,500 hours of commercial flying, having been flying commercially since 1978. He has been flying jet aircraft and has flown 737-200s into Queenstown. He has been a training captain and a flight examiner. He has given expert evidence in Coroners Courts and has also undergone courses of education in relation to matters involving safety, technical, or incident investigations, and has represented pilots both internationally and on various organisations and associations. He has rewards and recognitions from the Pilot's Association, including the Jean Batten Award and the Colins Family Award Scroll of Merit.

[119] He had considered the Exposition and in his evidence in chief criticised CAA. He described the departure of PBN89 as meeting the requirements to depart before ECT; the ECT requirement as described by him (in my view very surprisingly) as requiring the visual segment of the IFR departure procedure should the PIC elect to return to land following an emergency. (The emphasis on the word 'elect' is mine.) He appeared throughout his evidence to have taken a definitive view as regards to the position of the Exposition. He saw that the Exposition was giving guidance to pilots and saw it as being available for the "use and guidance" of the pilot. He discussed at some length the difference in Expositions between operators. I did not see that such evidence assisted me in consideration of the overall evidence as regards to the defendant's take off. Further, I do not accept Captain Julian's opinion where he says at paragraph 39 of his written brief that it is a

question of an election in the Exposition in regards to the return to land and that operators give guidance to pilots through the Exposition. I have found that the Exposition is a legal document that requires mandatory compliance by those operating airline services and that the Exposition itself when looked at in relation to the CAA 1990 and the CARs is a document that has legal impact and effect.

[120] I also reject that the words “to allow for visual manoeuvring” is as Captain Julian describes “...a somewhat conditional statement”. I hold that the words in relation to the visual manoeuvring do not in any way denigrate from the requirement that take off must occur at least 30 minutes prior to ECT.

[121] Captain Julian’s evidence places some emphasis in respect of the precedence of documents within the Exposition particularly in relation to the Route Guide and the Flight Crew Operating Manual. He uses that precedence of one document against another for his opinion that a return to a 30 metre runway at Queenstown would be against the Exposition if there had to be an alternate used on the day. I prefer and adopt Mr Lowe’s evidence on this issue.

[122] At paragraph 50 of his brief, Captain Julian considered paragraph 3.1.2(d) of the Flight Crew Operating Manual where a pilot in “...exceptional circumstances” can elect to act as required by the situation. I do not accept the relevance of Captain Julian’s opinion on that issue as the circumstances on the day in question could not be described as exceptional in any way.

[123] Captain Julian’s opinion is that a person can obtain a re-clearance for a Bungy Four departure if there was a failure or emergency occurring prior to Tollgate. A Bungy Four departure has a lower set heading height and would allow the aircraft to turn onto the 080 radial and away from high terrain in a preferred escape procedure. Under cross-examination Captain Julian agreed that he had not trained pilots to divert accordingly on any engine failure. He agreed further that there was no specific training in that regard. Whilst describing the Figure 8 return as “...somewhat challenging” he also under cross-examination accepted that the Figure 8 procedure was a procedure trained for and a procedure that he himself had trained on and trained others on. He did not give any evidence to the effect that he had

brought up his concerns about such matters with his employers prior to the incident on the day in question.

[124] At paragraph 55 of his brief of evidence, Captain Julian's opinion was that the PIC had a duty to produce an outcome. As this aircraft was light, the departure, were he was in charge, would have been planned on the same basis as the defendant, in preference to the "challenging" return to land. He noted that particularly in view of the weather conditions existing at the time. Captain Julian's opinion was that for a pilot to depart "...slightly less" than the 30 minute visual manoeuvring allowance when a return to land was not planned for was acceptable and would achieve the desired outcome "safely". He then said that in terms of the Air New Zealand Exposition the question would not have arisen. He would not have departed less than 30 minutes prior to ECT. I find that Captain Julian in this particular part of his evidence was 'splitting hairs'. My view of his evidence on this point takes into account that neither he nor Captain Douglas had ever raised any such issue on any prior occasion, albeit that they have been in a position where one would have expected them to do so. Captain Julian had trained pilots on the Figure 8 but never on this supposed lawful contingency.

[125] In relation to the visibility/cloud base, Captain Julian agreed that the cloud base was a critical factor and that it had to be assessed. The specific areas which needed to be looked at closely were along the Frankton Arm and the area behind Deer Park, and to the south in the Tollgate area passing on to the IFR departure. The points noted by Captain Julian included that assessing visibility and the cloud base was not an exact science; that the ATIS visibility and ceilings reports, and indeed the report from the Tower, is no more than an 'assessment' by controllers on their visual observation; that the ceilometers would report on the cloud level at the spot immediately above the instrument and does not therefore indicate the existing cloud base in the critical departure areas; and that the ATC would be unable to see behind Deer Park Heights and had restricted visibility in the area towards south Tollgate which is half the departure segment. Captain Julian went on to say that the captain makes a final judgment based on his personal assessment together with the Tower reports and that the captain in taxiing out to the runway 23 threshold then turning through 180° to line up had the advantage of an almost unrestricted view of the

relevant departure area. I found some difficulties in accepting this part of Captain Julian's evidence. The defendant would have been travelling to the runway 23 threshold with his back to the departure area and when the aircraft made its turn to face the departure area the aircraft was stationary upon my calculations for approximately one minute.

[126] Captain Julian described the advantage when the aircraft was lined up on runway 23 of the pilot being able to view through the Tollgate area down to Kingston. If that, indeed, is factually possible on a clear day, on the evidence I have seen and heard it was impossible on the day in question because of the low cloud.

[127] Captain Julian also criticised the cloud cover report on the amount of the cloud that could have been seen by the reporter. Captain Julian used Deer Park Heights to say that 1/3 to 3/8ths of the total sky over the Queenstown area would not have been able to be seen because of Deer Park Heights. Again in relation to this part of the evidence I have difficulties in accepting that Deer Park Heights would cut off a third of the total sky area of the Queenstown area. Captain Julian appeared to support the decision to depart on the basis of observations made by the defendant and his First Officer during the taxi out to runway 23, and put it clearly as he not seeing any basis for criticism of the crew. Again I point to the fact that the aircraft was at the threshold for a very short period of time and that for most of the taxi out the defendant's back was where the plane was to depart to.

[128] Captain Julian's evidence was also critical of the PB Exposition as to its level of conservatism when it was compared with the Boeing guideline on the cross wind limit on wet runways. The Exposition sets 16 kts. Captain Julian appears to overlook the point that the Boeing document specifically reserved the right to the operator to lower the cross wind limitation.

[129] The windsock in Captain Julian's view is the pilot's "primary reference" and their "most reliable tool" for determining wind. He described the windsock as a consistent and accurate indication of wind direction, allowing the pilot to deduce wind velocity to an operational degree of accuracy. He went on to say that the windsocks and the location of the windsocks at Queenstown in Captain Julian's

opinion were praised and the two anemometers using the Vaisala sensor equipment were criticised.

[130] I note Captain Julian's experience and background and I note further that he appeared to me to be giving his evidence carefully and was considering most issues; but there was no question raised on the evidence that the wind recording machinery and equipment, ie the Vaisala, was in any way inaccurate. I have as part of my judgment on this matter discussed the position in relation to windsocks, and Captain Julian's view of the windsock being a primary reference tool, I consider to be somewhat alarming.

[131] Captain Julian discussed the charts that are available but says that the chart provided is a clumsy and time-consuming document, and that a prudent captain makes an experience-based assessment on a "rule of thumb" calculation to determine the cross wind component from the Tower reported wind direction and velocity. Again when one has regard to the evidence that I have heard as regards to the prime issue being one of operating safety, a "rule of thumb" calculation does not appear to me to be in line with that.

[132] In all, Captain Julian's opinion was in full support of the defendant's departure on this day in question. His evidence in chief appears to me to overlook a number of the other matters in issue that the defendant needed to take into account and that the position of Captain Julian that the crew, ie the defendant and the first officer, were still evaluating and assessing the weather conditions up until the time of the take off roll commencing appears to be somewhat at odds with the very short time that the aircraft was on the threshold before that take off roll commenced. In Captain Julian's assessment of the cross wind at the time there is no mention of the gust reports that were also being made.

[133] Captain Julian's evidence included a discussion in relation to obstacle clearance, putting it in his view as the responsibility of the pilot on the day and not the procedure designer; that the First Officer's call of "speed" shows the crew working together; that the bank angle was quite unremarkable; that Boeing aircraft are known to be non-susceptible in respect of airframe icing and that he had not



experienced airframe icing requiring the use of wing anti-ice on more than one or two occasions; and that in this particular instance he would not have considered using wing anti-ice and would not have applied the wing anti-ice correction. He said that that decision would have been made by him on his experience with Boeing aircraft and knowing that they are not susceptible to airframe icing; but that he would have taken into account the conditions as well.

[134] In all, the opinion of Captain Julian was that the decisions made by the defendant were prudent decision-making around an operational and engineering requirement.

[135] Specifically when discussing matters relating to wind, wind gusts, cloud and so forth, the information that was being used by Captain Julian was giving him the benefit of hindsight. I see that his opinions are really based on hindsight information. I note that I need to consider the position of the defendant on the day at the time of take off and before and the information reasonably available to him at that time. Captain Julian described Captain Glasgow's concern that there could be a loss of friction grip on the runway surface because of wind gusts as "...absolute nonsense". Whilst the witness accepted turbulence could have an effect on the rate of climb, there were no reports of severe turbulence that he had seen in the evidence; the aircraft on the day would perform much better than what had been detailed within the tables for 62 tonnes because of its light weight; and that any bank angle was momentary and would have been indicative of light/moderate turbulence. When considering the defendant's calculations and methodology, Captain Julian said that he would not have taken out a performance manual to do the calculation. He described some of the issues as "basic knowledge" and that he was of the view that if he had been met with that situation he would have been competent in doing what the defendant planned to do.

[136] In relation to the lack of consensus between the ATC report and the evidence of the defendant as to his views, Captain Julian agreed that he himself would attempt to reach that consensus by engaging in dialogue; but said a number of pilots do not do that. His evidence was that ATC provides information of a standardised kind that has to be taken into account, but that a pilot is also qualified upon his own

observations through reading windsocks as to making decisions. He agreed that the Figure 8 return to land was achievable. He said that his evidence considered all relevant risks.

[137] Under cross-examination Captain Julian said:

- The Exposition was for use and guidance and the pilot is only required to follow the Exposition in the context of use and guidance in obeying the laws of nature and that if one has to breach the Exposition that would be acceptable.
- He agreed that the pilot was bound to comply with CARs. If faced with an emergency a pilot could deviate from the Exposition and CARs to the extent necessary to manage the emergency.
- He agreed the SOPs were a fundamental part of safety.
- He agreed that an operator had the responsibility to design and create the Exposition and to define the limits which have to then be approved by the regulators.
- As a general principle he would not endorse pilots making up procedures on the spot except in an emergency.
- He reiterated that a pilot should resolve any disconnection between the pilot and the reports he was receiving. He agreed that here a valid option was cancellation of the flight.
- He agreed that the warning in respect of ECT was applicable to all take offs and that it was mandatory and at the very least indicated a lack of discretion after 30 minutes.
- He said that a pilot could be more conservative than the 30 minutes dependent on the amount of light etc available.

- Captain Julian agreed that he, in the circumstances relating to the cloud cover, would have engaged in dialogue. He described the discussion as a “prudent” thing to do, ie to resolve the issue. He described it as a matter of commonsense, particularly placing his emphasis on the high degree of certainty needed for the visual segment.
- He discussed the position of the Deer Park Heights area and the decision to be made as to the position of cloud in that area. The witness agreed that making that assessment required that one first was confident that aerodrome minima of 2300 ft was able to be achieved. One way of doing that was to ensure there was no cloud between take off and the crossing altitude but that here the expectation and the view of the witness would be that the cloud would at some stage “stick” around Peninsula Hill.
- When Mr Pilditch questioned Captain Julian as regards the cloud going around Deer Park Heights and the western side, and that it was prudent to assume that the cloud went most if not all into all of that area that “...you couldn’t see..”, he agreed that was a reasonable scenario. He then went on to add, however, that there would be extra air space to commence a climb at an earlier point.
- Operational requirements did not facilitate a decision only to take off if there was no cloud between take off and Tollgate. Although there was a valid option to cancel, there was a valid option to operate in a safe and efficient manner. He said that the risk was mitigated by the view of the southern arm showing that cloud was lifting and the capabilities that this particular aircraft had.
- He agreed that the 16 kt cross limit was something that he would expect a pilot to obey; that as it was in the Exposition the pilot was required to comply with it. He then reverted to his prior position that the 16 kt limitation was only there for use and guidance.

- Under cross-examination Captain Julian agreed (in my view somewhat reluctantly) that it was open for an operator to be conservative and that it was a reasonable and prudent thing for the operator to be so. He agreed that the equipment in relation to the anemometer was installed and operating correctly but he said that the electronic format had inherent design limitation. He agreed with the proposition that Mr Pilditch put to him that the text of the Exposition which the defendant was using as a base for his decision in relation to wind was not saying that the Vaisala wind system was inaccurate but only that the wind anemometer was not very “representative”. He continued to take issue as to what the cross wind component was prior to and during the take off roll. He described the report of the 27 kt cross winds at the 05 threshold and the 14 kt cross wind at the 23 threshold as being historical and that the wind at the 05 threshold was of little application. Because these wind reports were “historical” a pilot would look at the windsock to get confirmation before making a final decision.
- The witness was questioned about the evidence of both the First Officer and the defendant that the wind information was disregarded. Captain Julian agreed that the information from an ATC has to be taken into account by any pilot and that it had to be weighed in the balance; that disregarding evidence was, as he put it, “not ...an acceptable practice”. Captain Julian agreed that the cross wind information would have raised issues. He agreed that there was some form of difference between the Captain, ie the defendant, and the First Officer but that dialogue with the Tower would have sorted that out.
- The various alerts and calls following take off were accepted as a high workload situation within the first minute and 11 seconds of the flight and that workload would increase as a result of those alerts and calls being made.
- He had never operated wing anti-ice at an altitude below 10,000 ft. That he had never flown from Queenstown with a temperature of 3° on the ground with clearly visible moisture and with an engine failure after Tollgate. He agreed that the departure was a performance critical departure; that wing anti-ice could degrade performance; and that with one engine the aircraft still

had to reach a safe altitude of 9800 ft. Captain Julian was questioned about the First Officer's evidence that if he had been flying out the next morning he would have been "...inclined to use" wing anti-ice. Captain Julian responding saying that type of decision-making should be "...encouraged". When asked about anything "bad" happening as a result of including the wing anti-ice increment Captain Julian made the rather surprising comment (NOE 1538/21) "...other than not getting, not being able to complete the flight because you can't achieve the set heading height".

- Captain Julian agreed that with an engine failure prior to Tollgate the Exposition/Queenstown special procedures prescribed that the return was to Queenstown via the Figure 8. There was be no alternate available because it would be prior to Tollgate, and the witness said that the process would be "challenging but do-able".

[138] It appeared to me that Captain Julian's position on the contingency was premised on the fact that there were adequate visual conditions and the cloud base was in excess of what was required. These subjective decisions of the defendant coupled with the aircraft being light were, in the view of Captain Julian, allowing the contingency designed by the defendant.

[139] Captain Julian however agreed that pilots had to have certainty, and that the procedures as designed were such that certainty was achievable. When Mr Pilditch questioned him about what the defendant had done on the day in question, particularly in relation to performance calculations and the briefing of this scenario, the witness agreed that it would have been prudent for the First Officer to be briefed step by step. The importance of achieving absolute certainty was mentioned.

[140] The discussion between the First Officer and the Captain as to space and distance being "correct" was accepted by Captain Julian as "enough". The First Officer being told "we will have enough" was accepted by Captain Julian as a briefing. When asked as to whether it was an acceptable briefing, the witness responded by saying it depended what was behind it. I found this evidence from Captain Julian surprising. He was questioned about the differing evidence from the

defendant and the First Officer as to the Figure 8 procedures being used, particularly the First Officer's position on the Figure 8 procedures. Captain Julian emphasised that if the two were not at "the same place" there were consequential risks. He was pointed to the evidence from the ATC/PBN89 discussions, particularly about the comment concerning, "we need about 1700 in Tollgate area" with the First Officer receiving the reply and then saying, "we'd be reasonably happy with that". Captain Julian agreed there was a possibility of confusing altitudes; a lot of altitudes being considered; that there was confusion between the crew therefore 20 minutes prior to the flight. He accepted that was a risk.

[141] It was put to him that the defendant said that when he got past Tollgate but before Slope Hill he would go out on the 080 radial. The First Officer considered that they would be carrying on with the nominated departure through the SID. The defendant's contingency thus would turn the aircraft right. The First Officer's view was that the aircraft would turn left. Captain Julian did not see that as a risk but a matter that would be quickly cleared up. He saw them both being on, as he put it, "the same page". It was not a risk in relation to this flight in Captain Julian's opinion. Towards the end of his cross-examination Captain Julian was asked about the aircraft being put back "on the gate"; the passengers then disembarked; and everyone "going to the pub". Captain Julian responded by saying it "...wouldn't have got the job done though".

[142] He was then questioned by me. He agreed that a pilot was not free to invent their own procedures. A pilot was expected to use good judgment taking into account the elements and, above all, a pilot had to ensure a safe flight. He accepted that on the day in question there were issues of low cloud, Deer Park Heights obscuring vision; a lack of knowledge as to the nature of the cloud behind Deer Park Heights; and whether it was prudent for a pilot to take off knowing that he was going to have to fly through that area but not knowing the conditions. The question that was asked by me was:

Q. Is it prudent for a pilot to take off knowing that he has to fly through an area where he knows that cloud extends into and he has no knowledge of its depth, height or whatever?

A. No.

[143] On an overall view of Captain Julian's evidence, his considered view of a number of the issues has been of assistance to me in my decision. Some of his other responses, however, left me questioning whether he was fully independent and was taking an objective view of what the defendant had in fact done on the day in question. That came down to a question of the overall weight to be placed on his evidence.

### **The Exposition, ECT and the available light**

[144] The informant's case on this issue is premised on the basis that the light was too low for any person to decide to take a 737-800 off a Category X airport, with the terrain and mountains that surround Queenstown. The Exposition clearly details the ECT restrictions as part of a warning that if the requirements are not followed carefully it may result in personal injury or loss of life. The Exposition is clear that it provides for daylight use of the airport only. Mr Pilditch submits that all this is not permissive or discretionary. He also places emphasis on the words "at least" which mean, in his submission, that the pilot has to consider whether a take off should be made prior to that 30 minutes. It is important, says Mr Pilditch, to note that the visual manoeuvring required on the Bowen Three take off as selected by the defendant required a visual segment and that had to be taken into account. Not only does there have to be enough light to see during that manoeuvre, but also to return. Mr Pilditch emphasised the mountainous terrain, the shadows created by the mountain, the wind factors and the difficulty the PIC would have to get a good view of the terrain. The ECT requirement, says the informant, is therefore to be treated as a minima and there was no suggestion ever made by the defendant that clarification was required. Any confusion on the part of the defendant as to its meaning appears, in the submission of the informant, to be belated.

[145] The defence do not take issue with the fact that any take off must occur 30 minutes prior to ECT so as to allow for visual manoeuvring. The defence witness Captain Julian describes it as a "conditional" statement. The defence accepts that there is a "prima facie" breach of the ECT requirements in terms of the Exposition as the take off occurred 20 minutes prior to ECT. The defence says that the breach was unintentional and the defendant would not have departed if he knew then what he

now knew as to the company's position on the interpretation of ECT, the defence arguing that the defendant misinterpreted the "visual manoeuvring" requirement. Mr Muir submits that the immediate deletion of the wording "visual manoeuvring" from the ECT warning in the Exposition is a "telling" factor in favour of the defence. The question still remains, says Mr Muir; did the defendant's actions in take off in breach of the ECT restriction mean that his action fell below the required standard of a reasonable and prudent pilot?

[146] The starting point must be the Exposition. It is a document that is formulated by the defendant's employer (PB) and then provided to CAA in order for PB to get its AOC. The Exposition is contained within various documents. I note that in the preface to the "Pacific Blue Operational Manual Volume A1" known as the "Flight Crew Operating Manual" that that manual is described at 'P2' as "...the top component of the Pacific Blue Airlines NZ Limited ... Exposition". In terms of paragraph 0.12.6 the Exposition requires mandatory adherence to such operational instructions and procedures by "...Pacific Blue personnel at all times." Crew members are required to familiarise themselves with the contents and structures of the Exposition as it is applicable to their responsibilities and duties. Indeed, it is specifically stated as part of the operating policy at paragraph 3.1.2(d) that flight crew must adhere to the SOPs and only in "...exceptional circumstances" can a captain elect to act as required by the situation. There is nothing in the Exposition document that gives a 'ranking' or priority of importance to one document or part of a document over another.

[147] Sub paragraph (d) of paragraph 3.1.2 goes on to say:

...The PIC must thoroughly brief the First Officer when deviating from standard procedures in accordance with the principles of this clause, and submit an Occurrence Report.

It was not disputed at the hearing that the Queenstown airport is a Category X airport. That categorisation is made on the evidence of Captain Glasgow in this respect (which I accept) for the purposes of ensuring that operators using the airport recognise the degree of difficulty the airport poses to pilots and that pilots receive



proper briefing and training to meet those difficulties (written brief of evidence, Captain Glasgow, at paragraph 48).

[148] Category X airport classification means that in addition to the special training and checking a pilot has to complete, there are restrictions and controls placed on aircraft flying into and out of the airport. The training can consist of special simulator and classroom training and flying with an instructor pilot prior to becoming a PIC. I note that Queenstown and Rotorua are the only two Category X airports in New Zealand (written brief of Glasgow at paragraph 50).

[149] In the Exposition for Pacific Blue Operations Manual Suite Volume C1 Flight Crew Route Guide at paragraph 3-ZQN-2, the information relating to the Queenstown Airport describes the steep ranges and mountain peaks and details the various ranges and peaks. Further, from the same Manual and Volume under the heading of “terminology” the definition of “Warning” is given as:

Information which if not carefully followed may result in personal injury or loss of life.

[150] In terms of the Exposition at paragraph 3-ZQN-6.2 a specific warning is given in relation to the Queenstown aerodrome. This warning is in the following terms:

**WARNING:**

**AIRSPACE**

CLASS D AIRSPACE.

NO RADAR COVERAGE.

**OPERATIONAL LIMITATIONS**

DAYLIGHT OPERATIONS ONLY.

ALL TAKE OFFS MUST OCCUR AT LEAST 30 MINUTES PRIOR TO EVENING CIVIL TWILIGHT TO ALLOW FOR VISUAL MANOEUVRING.

...

**ADVERSE CONDITIONS**

SEVERE TURBULENCE, DOWNDRAUGHTS AND WINDSHEAR CAN BE EXPERIENCED WITHIN THE QUEENSTOWN BASIN BELOW 4000 FT.

**TERRAIN**

QUEENSTOWN AERODROME IS SURROUNDED BY MOUNTAINOUS TERRAIN.

REMARKABLES RANGE TO THE SOUTH-EAST OF THE AERODROME INFRINGES THE CIRCLING AREA.

EGPWS ALERTS MAY BE EXPERIENCED DUE TO THE CLOSE PROXIMITY OF HIGH GROUND.

[151] In the context of this case, that warning is of considerable importance. It was common ground at the hearing that on 22 June 2010 Queenstown ECT was 5.44 pm. The aircraft being flown by the defendant took off at 5.25 pm. That was 10 minutes into the 30 minute restricted period prior to ECT.

[152] During the course of the hearing there was debate amongst the experts relating to the wording of the ECT part of the warning. The experts called on behalf of the defendant were of the view that the ECT warning was relevant to return to land if there was a difficulty, rather than a warning in relation to the daylight operations at the Queenstown airport as a result of its inherent difficulties. The defence accepts that there was a breach of the Exposition but that such breach was unintentional and, as the defendant had a planned contingency outside of returning to Queenstown, he only had to have regard to the time needed to fly the visual segment of the take off. Mr Muir in the submissions made at the conclusion of the hearing detailed what other airlines had provided in their Expositions, submitting at paragraph 7.13 (closing submissions on behalf of the defendant) as the “defining issue” whether or not there was sufficient light available if a return to land was intended.

[153] The defendant’s witness, Captain Julian, gave a description of this warning as a “conditional statement”. I do not accept this evidence. It is my view that the words, “to allow for visual manoeuvring” are descriptive only and do not impact upon the language of the warning which is explicit and mandatory in respect of all take offs having to occur 30 minutes prior to ECT.

[154] The defence experts appear to consider the words “visual manoeuvring” relate to the visual segment of the take off when the descriptive words are to the point and effect, in my view, of covering the aircraft’s overall positioning both at and on the airport and during the course of the take off. The terms of the warning detailed at paragraph 3-ZQN-6.2 discuss the need for visual manoeuvring and then describe “adverse conditions” and “terrain”. The wording of the caution then following relating to bird hazards, the operation of VFR aircraft, paragliders, hang-glider’s in the general area but without “reference to ATC” adds to the need to be “visual” and thus the requirement.

[155] On the basis of the clear words of the warning and the description of “warning” as contained in paragraph 1.1.7 of Operations Manual Volume C1 : Flight Crew Route Guide, I find myself unable to reconcile those parts of the Exposition with the defendant’s evidence that he was not aware of the employing operator’s position in relation to ECT restrictions. The defendant is an experienced PIC and a Training Captain with Pacific Blue. I find that I do not accept the defendant’s evidence on that point and find as a fact that he must have been so aware.

[156] I note that in an email dated 5 July 2010 (Exhibits Folder Volume 2, Tab 35) the following comment is attributed to the defendant. (I note that the defendant did not dispute that he had said what was recorded or that he had made the following relevant comments):

After approximately half an hour with no significant improvement it was realised daylight was going to become an issue and an enquiry was made as to when ECT was. I believe we were told around 1747.

...

I was however of the view that due to the conditions being changeable and around minima, that should a departure be attempted we would only return in the case of a dire emergency - otherwise we would treat Christchurch as a take off alternate, therefore I did not pay as much attention to the 30 minute manoeuvring allowance that I now believe I should have simply because in my mind this scenario was never going to occur.

[157] After having regard to the Exposition and the defendant’s duties in terms of the Exposition and detailing his requirement to comply with the Exposition, I find he breached the Exposition by departing within the 30 minute restricted period.

[158] The evidence of Mr Lowe (a witness called on behalf of the informant) was that the terminology of the warning was put into the Exposition and the 30 minute period established because of the nature of the terrain in Queenstown, the risks of shadow and the difficulties for pilots to get “really good views”. Mr Lowe’s evidence was that there had been no questions raised by any pilots in respect of the clear wording of the warning.

**What were the light conditions existing at the time of take off?**

[159] Again, there was a good deal of evidence in relation to this issue. The starting point in assessing that evidence was to have regard to the videos and CCTV footage that have been exhibited during the course of the hearing.

[160] I find that it is unassailable that the CCTV footage clearly established that the overcast cloud cover conditions existing at the relevant time had an impact in lowering the light that was available at the time leading up to and at the time of the departure of the aircraft.

[161] My analysis of the CCTV footage establishes to my satisfaction that the light conditions were poor throughout the period from 5.00 pm up until the time of departure at 5.25 pm. I accept the submissions made by Mr Pilditch on behalf of the informant in respect of the CCTV camera at the terminal and the impact on it when changing between the artificial light of the terminal and the outside light. I also note the evidence of Mr Debono in relation to the CCTV cameras and the artificial adjustment mechanism which allows enhancement of viewability when the camera is recording. Mr Debono's evidence as pointed out at paragraph 4.36 of Mr Pilditch's closing submissions on behalf of the informant (Mr Debono's brief at paragraph 67) states:

This means that the lighting conditions observed on the CCTV may appear to be greater than what the conditions actually were.

This would support and corroborate Mr Ward's evidence in relation to the light conditions having been darker than those shown on the CCTV cameras.

[162] I am satisfied, when I carefully consider the CCTV footage from the camera operating near to the witness Mr Debono's office, that the evidence on that film when one has regard to the areas when looking to the northwest shows lighting conditions that are deteriorating. For time reference I refer to:

17:10                      My assessment of the light looking to the northwest in that shot is that the light could be described generally as poor.

17:16:32           The light in that shot has worsened somewhat.

17:16:14           As the camera pans the light is no better than what it was at 17:10.

17:18               It is my view that that view shows that light has deteriorated further from 17:10.

The light shown at time 17:19:01 and 17:20 are similar.

Light at 17:22:22 shows the light has again faded. At 17:24 it has got darker once again.

[163] In respect of the second piece of CCTV footage, I note there that in the foreground of the shots that are taken from 17:21:07 onwards there is an Air New Zealand aircraft in the immediate foreground. That aircraft is painted white. Having considered the evidence of Mr Ward and Mr Bremner I remain unsure over the compensating reaction of the cameras to the fact of that white fuselage being in the foreground of the photograph. In the end I find that that particular part of the camera footage does not assist me greatly in my decision on the actual light levels.

[164] In relation to the CCTV footage I hold that overall the lighting leading up to and at the time of the departure was not good and was fading further. I would expect that to be occurring in any event at 17:25 on 22 June 2010 in the Queenstown area taking into account the weather conditions pertaining at the time, mountain shading and the general terrain surrounding the airport. I am satisfied that the video footage which I do accept shows the light conditions at its very best. The evidence of Mr Debono was of assistance to my overall assessment and use of the CCTV footage.

[165] In respect of the video footage taken by Simon Christie (a passenger on flight PBN89) I note in relation to the lighting conditions at the time that when the aircraft was being boarded the outside conditions were wet, and there appeared to be low level cloud cover in the area of sky that could be seen. The light at the time could best be described as low level and foggy. With the aircraft still at the gate, a camera shot through the cockpit showed the light conditions outside the cockpit as fair, but I also note that the shot was restricted. In relation to those two pieces of the video there did not appear to have been any light adjustments or compensation by the

camera. As the aircraft went into its take off roll, the camera appears to have been adjusting to the light from the wing that is in the shot and I accept the evidence that the light conditions as depicted in that video are less than helpful because of the difficulties in being able to ascertain exactly what was functioning or was not functioning with the camera Mr Christie was using. I do, however, find from the video footage out the window of the aircraft as it proceeds down over Lake Wakatipu and along Frankton Arm, that house lights are on; car lights are on; and further along Frankton Arm, (the plane flying at a reasonably low level) the shape of houses can just be made out.

[166] Mr Debono's evidence was that in his view it appeared dark at the time of the take off (paragraph 21 evidence in chief). At paragraph 32 of Mr Debono's evidence in chief he said:

One thing that is vivid in my memory is the lighting. The navigation lights and strobe lights on the aircraft were actually quite pronounced, which you do not normally see here because airlines do not operate in low light or dark conditions.

and at paragraph 33:

The aircraft lights were very bright and almost had a halo type effect on those lights, which is typical of watching an aircraft depart in the dark.

and at paragraph 42:

However, I have never seen anything like PBN89 departure on 22 June 2010 at that time of the day and in those low lighting conditions. This was something unusual.

Mr Debono was employed as the Queenstown Airport Operations Manager and as at 22 June 2010 had been in the role for six years. He was the holder of a private pilot's licence and had three credits towards his commercial pilot's licence.

[167] Mr Sakareassen was an air traffic controller working in the Tower on the day. When asked by Mr Muir in cross-examination about the light conditions in the video and as to whether those light conditions were a fair reflection of the light conditions at the time, Mr Sakareassen responded by saying he felt they were not because he was making assessments of the cloud based on the terrain that night; whereas in the

video he felt he couldn't see the terrain clearly. There was the following passage during the course of the evidence (NOE 50 onward):

Q In reflecting on the CCTV footage that you have looked at also, is that a fairer reflection of the light conditions that you recall at the time than the video footage?

A Um, I mean remembering I was looking behind tinted glass, it probably did appear, um looking at that footage, it does appear quite bright, um but it was fair in the sense that it did reflect the, ah, the terrain was reasonably well defined and the aircraft was well defined so in that sense, it was fair, but ah, ah from my observation it may or not have been brighter, but it's hard to recall that.

Q And did you make any assessment on the evening of the adequacy of the light conditions in the area towards Lake Hayes where an aircraft that was going to return to land would circle?

A Not so much the light conditions but there was, ah, ah, quite a lower visibility at that direction so um, there's, things out there were harder to discern but not light as such.

[168] Daryl Robert Palmer was a flight service specialist with Airways New Zealand. Mr Palmer told Mr Muir that after considering the CCTV footage in relation to the light conditions he thought the CCTV footage generally accorded with his observations but that he didn't recall a huge amount of the day.

[169] A "telling" observation is from the transcript of the Queenstown Airport Tower discussions. (I refer to Exhibits Folder 2 at Tab 47.) There is an excerpt (timed at 5:25:13) which went as follows:

RFS How big are his gonads?

QN (D Palmer) Good, good night flight ops

RFS Yeah

QN (D Palmer) Fuckin hell I haven't seen this before

RFS (Laughter)

QN (D Palmer) I was just saying, if he doesn't, yeah, if he doesn't set heading ...

RFS Oh he's screwed

QN (D Palmer) ..round the back (talking over each other)

RFS Yeah that has to keep going

QN (D Palmer) Fuckin .. he's committed .. he'll be gone .. he won't be coming back

RFS Yeah

QN (D Palmer) So yeah ..

RFS Anyway (laughs) he's got some balls ..

QN (D Palmer) Okay, cheers nite

RFS Okay ciao

[170] It is accepted that the reference to "QN (D Palmer)" is reference to the witness Palmer. As Mr Pilditch points out in his closing submissions at paragraph 4.26 and 4.27, this is a record of a contemporaneous observation of light conditions. It comes directly from Mr Palmer who was talking at the time to one of the airport firemen. In answer to questions at p 78 line 29 of the transcript in his evidence in chief when asked about that statement Mr Palmer said (NOE 78/29):

I think, like I said in the statement, I can't recall the phone call but obviously I can confirm it was me and possibly I haven't seen Bluebird take off in those conditions, maybe, um I can't.

I accept that the conversation and the comments made related to what Mr Pilditch at paragraph 4.27 of his closing submissions described as "a lack of daylight".

- Robert Edward Clark described the level of light as "...getting on to dusk .. I had my lights on".
- Lynn Elaine Cain in cross-examination said, after having viewed the CCTV footage from the terminal camera, that the light conditions depicted in the recording accorded generally with her recollection of the light conditions at the time.



- Macgregor Max Perkins confirmed that he was a qualified commercial pilot with some 400 flying hours. He had not flown jet aircraft. He was stopped in his motor vehicle on Frankton Road on the southern side of the airport runway. Mr Perkins told Mr Pilditch (NOE 233/25) that he would describe the light as “low light”, not dark “..certainly not dark, if I remember right I did have my lights on ..”. At p 680/30 of the notes of evidence, Mr Perkins confirmed that the light was low but that you could see the surrounding mountains without trouble.
- Andrew William McKenzie (NOE 327/21) described what he saw from the Frankton Marina area as “it was more the, just the poor visibility of the front coming in.”
- Mr Perkins was recalled (NOE 680 onward). He was cross-examined by Mr Muir in relation to the light. He confirmed that he described the light as “low light, you know, near dark”. He said that he would “still agree” with that. He went on to say as follows:

What I do recall from that then is that um is that it was not, not daylight, obviously not dark, um I don't recall the street lights being on, um you could certainly see the surrounding mountains without any um without any trouble um but it's, I'm suppose I'm trying to come up with the correct adjective you know, it's, um, but yeah, it was, I would, I would describe it as low light but not dark.

He was then questioned by Mr Muir about an email he had sent on 27 July 2010 where he used the words, “the light was still good”. Mr Perkins accepted that it was slightly contradictory but went on to say, “the light was, in my opinion, um, acceptable for departure” but he accepted that he had not flown a Boeing 737-800. I further note that Mr Perkins was not qualified as an expert to make that particular observation. I found his evidence confusing and somewhat contradictory.

- Michael James Mead said he had observed the CCTV footage and the Christie video footage. In relation to the CCTV camera footage and the question of light, he was of the view that the CCTV footage depicted the light conditions as they were as he remembered. He considered the Christie footage to be

somewhat darker than what it was. He said that the lights were on in Queenstown but that he could “pick out” houses.

- Brett Glass (a defence witness) at paragraph 35 of his brief said that the lighting was heading towards dusk but that it was more than adequate for a visual take off. He described the light as being that of daytime rather than night time. I note that Mr Glass has an existing contract with PB. Extending his written brief, Mr Glass described (NOE 1390/28) that the CCTV footage showing the aircraft at the end of the runway was the closest to the “genuine light”. I have difficulties in accepting that evidence. In my view, that footage is taken at a time when the camera is zooming in. As a result the light effects of the camera would be operating. Mr Glass accepted under cross-examination that street lights were on. He also accepted that such lights were switched on as it was getting dark. The witness was not aware of when ECT was that particular night.
  
- Robert Wales is also contracted to PB. He describes the lighting conditions as “not of concern” to him as at the time of the departure. He supported the view that the CCTV footage would seem to be a reasonable depiction of the lighting levels. He made the very surprising comment that he considered the light conditions would be adequate to play a game of rugby. That comment appeared to me to be rather at odds with what I had observed from the CCTV film and from other witnesses.

In relation to both of these witnesses, it is a question of the weight to be attached to their evidence. I take note of their positions with their contracts with PB. I formed the view that their evidence was such that they were prepared to be less than critical in relation to the light conditions at the time and accepted the CCTV footage without really accounting for the changes in background light due to zoom and other effects of the camera.

- First Officer Rush’s evidence described the light conditions (NOE 1323/20) as:  

“..being that time of night where a motorist might need to use their park lights or their headlights to be seen by other motorists for safety reasons, but

there are, by no means driving within the length of your headlights, you've got good, good visibility and ah you're driving as per normal."

First Officer Rush went on to say that generally the CCTV footage depicted accurately the light conditions as he recalled them; that the Christie video did not bear any resemblance to the actual light conditions. I have difficulties in First Officer Rush's assessment of the light conditions. I note that he describes the light conditions as being "that time of night". Surprisingly, First Officer Rush (NOE 1332/19) describes the flight, agreeing with Mr Pilditch's question, as just a "routine departure, routine flight". He then went on to describe that he "loathed the departure". He made other similar somewhat surprising comments. I found his overall evidence to be somewhat unreliable and inconsistent.

[171] The defendant told Mr Muir in his evidence in chief that he (as PIC) had no concerns about the light, putting it as follows:

I had absolutely no concerns about the light operationally.

[172] He suggested that the middle "sort of light" from the CCTV was an accurate reflection. He described it as being "daylight" with more than enough light and that he could see hills, runways and that was acceptable. He had formed a view of the ECT requirements and the restrictions on him that will be the subject of later findings in this decision. I am troubled by the defendant's view of the ECT requirement in that he discusses it as in his view being only applicable in respect of ECT to performing the Figure 8 special circuit required and not to overall visual manoeuvring. He agreed with Mr Pilditch that he had had training in relation to his qualifications to fly aircraft into Queenstown including information about the ECT warning. His evidence was that as he had determined that he would not be "coming back" if there was an engine failure, the ECT requirement did not apply to his departure. Captain Gunn's evidence was that he considered that he had leeway to go into the 30 minutes and that the words of the warning meant you could not take off after ECT on 22 June 2010. As against that evidence, he told Mr Waring during the investigation conducted by his employer that he was aware of the requirement but not the "specific details". He accepted that his understanding was different from

other people's including his employer's. He said that he had tried to look up the ECT details but "could not find them". He denied that the alternative was an afterthought and had been thought up by him to justify his lack of understanding about the ECT requirement. I found the defendant's evidence on this issue to be unsatisfactory and not an acceptable explanation of the circumstances as they applied to the mandatory nature of the ECT warning. I place emphasis on the contents of the defendant's email to the investigating officer for PB. Albeit during the course of his cross-examination he attempted to describe the warning as only something you have to "take note of", in the end he accepted it from a question by me that it was a mandatory requirement.

[173] I hold that the terms of the warning are mandatory and that the warning did apply to the defendant. Further, I hold that the warning in the ECT requirement is the bare minimum – ie, "at least".

[174] I am satisfied on my view of the overall evidence that the light available at the time of departure was at best poor and that fact, allied with the nature of the accepted breach of the ECT requirement as detailed in the Exposition, was such that this take off should not have occurred at the time that it did on that day.

### **The defendant's contingency**

[175] Under cross-examination the defendant told Mr Pilditch, counsel for the informant, that the ECT warning was not applicable on this particular day to the departure as he was not planning on the contingency if returning to Queenstown. As he put it (NOE 1153/1) "in the context of the departure it was not applicable". The defendant as PIC did not plan for a contingency to allow for two Figure 8 circuits in the event of engine failure.

[176] The argument put forward on his behalf is pre-supposed on two areas of the Exposition.

- First, in the Boeing Flight Crew Operations Manual at page L.10.2 (exhibit folder 3, Tab 5); and
- Secondly the Flight Crew Operating Manual (folder 3, Tab 1) Boeing's recommended operating limitation at page L.10.2 discusses 'narrow runway (less than 45m) operation'. This is a paragraph that the defendant says he relied on.

"The despatch from/to runways less than 45m wide is not allowed in case of nose gear steering inoperative or one thrust reverser inoperative. If an alternate airport is available with a runway at least 45m wide, diversion to that alternate shall be performed in case of jammed ... single engine inoperative ... hydraulics.

(This quote comes from the chapter which is described as containing "...airplane flight manual (AFM) limitations and Boeing recommended operating limitations."

[177] I repeat, as detailed in the Exposition, that "it is general Pacific Blue policy to use the aircraft manufacturer procedure whenever practicable." In the case of a discrepancy between documents, the Pacific Blue manuals take precedence. (Reference - Pacific Blue Operations Manual (Part A) Volume A1 : Flight Crew Operating Manual Chapter 3 "Flight Crew General Operations" paragraph 3.1.2(b).) That Boeing recommendation is brought down into the Pacific Blue Operations Manual Part A Volume A1 : Flight Crew Operating Manual in paragraph 7 headed 'Boeing 737 Standard Operating Procedures' at paragraph 7.1.4.

[178] The case for the defendant was put on the basis that the limitation so expressed compels a pilot, if there is a suitable alternative airport available, to use that alternative airport as the alternative for contingencies. Therefore these provisions which he says he saw as "mandatory" removed the need to follow the specified Queenstown procedures. That is to say that he would not bring the aircraft into the Figure 8 circuit but that he would exit the north basin to the east of the Queenstown airport using the 080 radial. His evidence was that as he could achieve the height required at Tollgate because of the aircraft's performance and its light loading, and if such alternate is available (ie, suitable on the day and capable of being flown to) and the runway at the alternate was at least 45m wide then the aircraft must be diverted there in the case of single engine inoperative. Therefore the

defendant's case is that he put the ECT requirement to one side because he would not be returning to land in Queenstown.

[179] "Alternate Aerodrome" is defined at paragraph 4.4.4.1 of the Pacific Blue Operations Manual Volume C1 : Flight Crew Route Guide.

- (a) An Alternate Aerodrome is 'an aerodrome specified in the flight plan to which a flight may proceed when it becomes impossible or inadvisable to land at the aerodrome of intended landing'.

[180] I note that in terms of paragraph 0.12.6 of the Pacific Blue Operations Manual Park A Volume A1 : Flight Crew Operating Manual, it is stated:

The rules, regulations, procedures and operational instructions contained in the Operations Manual shall be adhered to by the relevant Pacific Blue personnel at all times.

[181] That mandatory requirement placed on personnel in relation to the Operations Manual is confirmed in the Flight Crew General Operations paragraph 3 of the document as paragraph 3.1.2 (b) where it is stated that:

All flight crew must adhere to the Standard Operating Procedures (SOPs). However Pacific Blue recognises that SOPs cannot cater for all situations and hence, in exceptional circumstances, the Captain may elect to act as required by the situation. The PIC must thoroughly brief the First Officer when deviating from the standard procedures in accordance with the principles of this clause and submit an Occurrence Report.

(Underlining emphasis added)

[182] Within the Pacific Blue Operations Manual Volume C1 : Flight Crew Route Guide, it is noted the purpose of that manual is :

"...to provide specific information and procedures of a detailed nature relating to aircraft type related matters, aerodrome and route information, communications and navigation and where applicable service related matters.

[183] Mr Muir, in his closing submissions (paragraph 7.40), argued that the fact that the provisions of paragraph 7.1.4 had its origins in the Boeing requirements and are then repeated by Pacific Blue in the manual suite in Volume A1 was important. Volume A1 is described as the "top" component of the Pacific Blue Airlines NZ

Limited Manual Suites Exposition (that point is accepted by Mr Lowe who gave evidence for the informant). The defence experts evidence was that there is a “degree of precedence” with the Flight Crew Operating Manual taking precedence over the Route Guide.

[184] I find that I question that evidence and Mr Muir’s submission. I have regard to the provisions within the Flight Crew Route Guide in relation to Queenstown. At paragraph 3 of that document there is a specific section detailing the background in relation to Queenstown. The introduction at paragraph 3-ZQN-1 says:

This Queenstown Route Guide contains information specific to company Boeing 737 operations into and out of Queenstown.

Particularly at paragraph 3-ZQN-5 issues relating to the weather including wind characteristics, turbulence, fog, visibility and low cloud/precipitation are noted. It contains the particular definitions of ‘WARNING’, ‘CAUTION’ and ‘NOTE’. It then provides for a specific warning in respect to Queenstown which has been described elsewhere in this decision.

[185] At paragraph 3-ZQN-10 under the heading “Departures” it contains specific instructions to pilots in relation to departures ex Queenstown. That paragraph discusses the special take off procedures in relation to the Queenstown airport and contains paragraph, 3-ZQN-10.1. That paragraph is headed:

**Engine failure after take off**

In the event of an engine failure after take off, manoeuvre via the figure eight special procedure circuit until all the necessary checklist items are completed. This may require the completion of more than one circuit.

Quite obviously, that is a specific instruction in relation to engine failure from the Queenstown airport. The procedure which is described as the ‘Figure 8 special procedure’ has been designed and put into the Exposition specifically for Queenstown.

[186] I find that the Standard Operating Procedures at paragraph 7.1.4, page L.10.2 of the Flight Crew Operations Manual (Boeing) are superseded by the specific data

contained within the specific Queenstown procedures. I take note of the evidence of Mr Lowe (as the Flight Operations Manager for Virgin Australia New Zealand (aka Pacific Blue)) as to the way in which these procedures were drawn up and put into the Exposition. The specific procedures took into account the nature of Queenstown and its complexity. As a result, meetings took place with performance engineers and management pilots. The procedures were then put together. Information was obtained from other air operators. The data was then entered into a tool called the "Boeing Climb Out Performance Tool" measuring and calculating climb performance with an engine out. Finally the procedures were determined. The particular procedures were then tested in simulators. The procedures were further "tweaked" as a result of this testing. Further work was undertaken in simulators. Mr Lowe's evidence was that the simulators can input weather and terrain; that they are sophisticated equipment and take into account the length and width of a runway. The climb performance profile then established was matched to topography charts. The minimum clearance being set at 35 feet above the highest obstacle. He described the Volume C1 : Flight Crew Route Guide as being the section of the Exposition Manual detailing specific requirements for the various regions into which Pacific Blue operated. He put it as "an integral part of the Manual Suite". (NOE 354/19.) Mr Lowe's evidence was that there was no hierarchy as between the various manuals making up the Exposition, all manuals being just as important as the other. Mr Lowe's undisputed evidence was that Pacific Blue had a 30 metre "supplement" and thus therefore could operate into a 30 metre wide runway. Mr Lowe's evidence was that as a result of two factors, namely because Pacific Blue could not be sure of obstacle clearance, and Pacific Blue wanting to make the engine failure procedure simplistic there was a direction for the pilot to return to the Queenstown airport upon engine failure via the Figure 8 and land. He said that was what was practiced by the pilots in the simulator and contained within the training programmes for Queenstown pilots. His evidence was that flying the Figure 8, "come back to land", takes precedence over the generalised clauses relating to going to an alternate aerodrome. Mr Lowe's evidence was that the alternates for Queenstown with engine failure prior to Tollgate would be Queenstown. The alternate becomes available, (eg), Christchurch or Dunedin, after Tollgate or after Slope Hill. Mr Lowe's evidence was that there was no "discrepancy". There was no alternative airport available because the direction from



the company to the PIC with engine failure before Tollgate was to return to land at Queenstown.

[187] Under cross-examination (NOE 399/5) Mr Lowe confirmed that the top Manual for the Exposition is the Pacific Blue Management Manual. He confirmed that in his overall view the four major columns contained manuals which are equal. He describes the other manuals as part of the Operations Manual Suite with the hierarchy referring to the Pacific Blue Management Manual. In relation to the clauses relied on by the defendant Mr Lowe's evidence was that no-one else had raised any such issue and there had not been any Occurrence Reports filed in respect of such clauses. Under cross-examination Mr Lowe acknowledged the workload that the First Officer would need to complete upon an engine failure prior to Tollgate and the return through the Figure 8 procedures.

[188] When I look at the evidence of the defendant and the First Officer in regard to this issue and what occurred in the cockpit while the defendant was putting the Exposition-based and trained-for contingency alternatives to one side, I find that:

- i. He was using "intrinsic" knowledge that he had and was referring to a Google Earth exercise conducted by him sometime prior to the day in question. Other than his evidence I have not seen or heard any supporting evidence as to the undertaking of this exercise.
- ii. The climb gradient calculations were done using a graph that was designed and in the Manual for an entirely different purpose
- iii. ECT and the restriction was fast approaching; the defendant held a view in relation to the wording of the ECT requirement which in my finding was at odds with the way in which the ECT warning was structured.
- iv. The defendant is not a performance engineer, yet he was doing calculations based on the 9 mile track information ex Google Earth together with his experience of the plane's capabilities. He was, in my view, guessing issues in relation to the turbulence, wind and similar such factors.

- v. There appeared to be little discussion or input from the First Officer who had very basic knowledge of the Queenstown operation and had not been trained at all other than in himself going through a computer training programme in his own home. The defendant must have been aware of this.
- vi. The defendant did not take any opportunity to contact management pilots or the operations centre of Pacific Blue to discuss his proposal and to attain their views on his proposal.
- vii. The defendant in my view of his evidence appeared to be insistent on the approach that was to be taken. He said he had decided to put the Figure 8 requirement to one side as a result of the approaching ECT and Queenstown airport restriction for daylight operation only to avoid later arguments in relation to return to land. I also considered his evidence that he had done the Google Earth calculation at an earlier time and that he had a detailed knowledge of the information he had used. I note from the Waring Report that the defendant had told the report writer that although he was aware of the ECT requirement he was not aware of the “specific details” and was “unable to locate the information” about it. This was despite the defendant’s position with the airline and the detailed training that he had been given. When I compare the defendant’s position to the two separate issues, his detailed recall of one and his inability to exactly recall the other, I am left in some doubt as to what he did plan in relation to the contingency.
- viii. The defendant had an inexperienced First Officer.
- ix. The defendant was in weather conditions that were of concern in relation to cross winds, cloud cover and light conditions.
- x. In such circumstances he then (on his evidence) decided to use an alternative upon the basis of his calculations. He put to one side entirely the calibrated, checked and trained-for prescribed alternative procedures involving a Figure 8 return so that he could facilitate his take off at a time when, if he had to return to land, he could not have taken off at all.

[189] I need to assess the defendant's position in light of those factors rather than whether he was in blatant breach of an Exposition requirement. I note that Mr Muir accepted that there was a breach of the Exposition as to when the take off took place but argued that it was totally excusable because of the contingency planned for on the ground by the crew in the cockpit.

[190] My perusal of the evidence indicates very strongly to me that it was a decision of the defendant that resulted in the take off proceeding. I find that there was very little, if any, input into that decision by the First Officer. The First Officer's evidence in relation to what he did and did not do is unconvincing. It is also somewhat surprising that his calculations as to the length of the track from V1 to Tollgate ended with the exact same figure that the defendant had (on his evidence) obtained from Google Earth at some previous time.

[191] In the end, taking the defence case at its best, the process and procedures that the defendant intended to follow were processes that were not in accordance with the Exposition requirements for an engine failure prior to Tollgate. In his calculations he did make allowances on what could only be described as 'guesstimates' in respect of turbulence, wind and similar such matters. On such a basis he disregarded the trained-for alternate detailed in the Exposition. The defendant disputed that this would have caused confusion. The evidence of Mr Rush indicates that he was not aware of exactly how it was intended that the contingency would occur. His evidence (as against the defendant) indicates a lack of detailed briefing on this aspect. His use of the graph, as he put it, in "reverse order"; (a graph designed for an entirely separate purpose) is alarming. The defendant (NOE p 1061) gave evidence that he was going to turn right if there had been engine failure as that was the "sensible thing to do" and go on the 080 radial rather than left on to the 252 radial. The First Officer's evidence was that the aircraft would be continuing to fly to the left on the 252 radial if the new contingency procedures were followed.

[192] On First Officer Rush's evidence it is clear that he found the process alarming overall. He appears to have been prepared to accept the defendant's calculations without further enquiry. Albeit at the commencement of his cross-examination he considered the departure ex Queenstown to be somewhat of "routine", he then went

on to stress his feelings of unease. He did not raise such feelings with Pacific Blue, nor did he say anything to Mr Waring, the Pacific Blue investigator. He had concerns on the state of the weather, particularly the prevailing cloud conditions, but in his view it was for the Captain to “drive the choices”. There were differing views between his evidence and the defendant’s evidence on the way in which the ECT issue was detailed and as regards to him saying the nine miles rather than the defendant. He put it as the defendant saying “we’ll have enough”. First Officer Rush’s evidence was that he was not aware that the defendant was using the obstacle limit graph in the manner that he was, and that he placed the whole process as being “over a few minutes” putting the time at 4.45 through 4.50 pm.

[193] The answers given by the defendant in cross-examination in relation to the result of the passage of the aircraft along the visual track up Frankton Arm and around towards Tollgate where the plane had to go lower to avoid entering cloud and its impact upon his calculations, was also enlightening. This had not been allowed for within the defendant’s calculation. In the end the defendant accepted that calculation for terrain clearances and the setting up of departure processes was an operator responsibility not a pilot’s. He accepted that in respect of aerodromes flown into and out of by Pacific Blue that all of those aerodromes have been surveyed by Pacific Blue. He assessed that on his approach it was absolutely critical that if he had engine failure prior to Tollgate that he could get sufficient altitude to leave the Basin.

[194] Mr Lowe described the detailed procedure of information gathering; the use of a specifically designed programme in respect of establishing climb gradients; meetings detailing the required procedures to ensure terrain clearance. It was clear on his evidence that all of this took some time. The defendant’s evidence was that his calculations took him approximately half an hour (the evidence of First Officer Rush disputed this as his evidence was of a much shorter period).

[195] I take into account the evidence that the defendant’s thinking about available alternatives included that although in his view he had departure minima, he did not have landing minima that would enable him to complete the Figure 8 requirement. In my view on the overall evidence that I accept the defendant was looking for a way

around the required procedure. The defendant had the opportunity to discuss his proposal with Pacific Blue management and did not do so. The defendant in my finding on the evidence wanted to leave.

[196] In summary I hold that:

1. There is some confusion concerning the alternate aerodrome requirements in the SOPs and the detailed specific operating procedures for Queenstown. I find that the detailed and specific Queenstown operating procedures take precedence as logically the appropriate parameters as detailed in the Queenstown SOPs are specifically designed, tested and regulated procedures.
2. I accept Mr Lowe's evidence that prior to Tollgate Queenstown was the alternative.
3. The defendant's decision to depart must be considered in the overall situation pertaining over a short period of time; in poor light; ECT approaching; weather conditions at minima and decisions made to use a process calculated by the defendant, untested and unapproved.
4. Example of risk is shown at the time when the aircraft had to descend in order to avoid cloud and the overall impact of that upon the processes designed by the defendant in the cockpit of the aircraft prior to leaving the gate.

### **Cloud base**

[197] The evidence of the expert for the informant, Captain Glasgow, establishes that Queenstown Airport is a Category 'X' airport. That classification requires any pilot flying in and out of the airport to have been cleared to do so through special training and checking. There are also restrictions and controls placed on aircraft flying into and out of the airport. The Queenstown Airport area is classified as a Class D airspace as radar, because of the surrounding terrain, is ineffective. That results in the ATC not being able to use radar to see other aircraft through terrain and particularly behind Deer Park Heights (also known as 'Peninsula Hill'). The restricted Class D airspace requires aircraft to visually avoid each other. Airline

traffic operating on IFR have to maintain visual contact with the ground and comply with VFR weather limits during the visual segments of the departure procedure.

[198] CAR Part 91 Paragraph 91.413(f) (take off minima) requires that a PIC of an aircraft must not take off from an aerodrome under IFR unless weather conditions are

“1. At or above the weather minima, for IFR take off published in the applicable AIP for the aerodrome: ...”

[199] CAR Part 121 Paragraph 121.169(b) (IFR procedures) states:

“(b) Unless a clearance has been obtained from the appropriate ATC unit in controlled airspace, a pilot in command must comply with any IFR departure and approach procedure published in the applicable AIP for the aerodrome being used.”

[200] The AIP New Zealand at NZQN AD 2-52.1 (see exhibit folder 2, item 33) (operational data for the Queenstown airport) provides in relation to IFR take off the following minima:

RWY	DAY	NIGHT
05/23	2300-5	NA

(ie) Runways 5/23: Day - a cloud base at or above 2300 feet AGL and horizontal visibility of 5 km.

[201] The defendant advised ATC that his departure from the Queenstown airport would be using the Bowen Three departure procedure (a specifically designed procedure which takes into account Queenstown terrain, environment and conditions). That procedure imposed minimum operating requirements. It provides as:

Minimum net climb gradient 3.3% (200 feet NM) unless higher stated.

Minimum turn altitude after take off, 1600 feet.

(See document included at paragraph [36] hereof.)

[202] PB use the Jeppesen chart. That states:

Minimum net climb gradient of 6.2 percent (375 degrees NM) to 9800 feet.

Reach minimum 3800 feet at Tollgate.

(See document at paragraph [36] hereof) These two documents establish to my satisfaction that the procedures designed specifically for Queenstown to suit its environment and operating conditions impose minimum operational requirements.

[203] A Bowen Three departure process is an IFR procedure. It contains a visual segment from take off to Tollgate. The visual segment is required due to the issues of surrounding terrain, the absence of radar, and the high levels of general aviation. The requirement is for the PIC to fly his aircraft visually, observing the surrounding landscape and any other aircraft within the area in which the plane is flying. The visual segment applies until the plane overheads Tollgate where the pilot is permitted to enter IMC. The Bowen Three departure procedure imposes a minimum height for turning at 1600 and maximum speed in turns from take off at 180 kts until SH VOR DME 113.6 (I also refer to documentation at Exhibits Folder 2, Tab 33) when the aircraft is able to turn left to establish onto radial 252. This maximum speed is imposed as the aircraft is having to manoeuvre within terrain and is designed to keep the aircraft a safe distance from terrain as the higher the speed the wider the arc of the turn.

[204] CAR Part 91.301 provides that airspace VFR meteorological minima for the Category D airspace is to be clear of cloud 2 kilometres horizontally and 500 feet vertically within a controlled zone. I find that the defendant as PIC of PBN89 was required to ensure, prior to his departure, that the cloud conditions pertaining at the time were such that he could be assured that such visibility could be maintained throughout the entire visual VFR part of the flight to Tollgate. During that visual segment the defendant was required to avoid entering IMC before Tollgate and to maintain visual separation from the terrain. The defendant was therefore required to assess the actual cloud conditions pertaining at the time and to ensure prior to any departure that he could meet the visual segment requirement of avoiding IMC before Tollgate. His assessment would have to include the portion of the visual segment which could not be seen from the cockpit of the aircraft at the Queenstown airport,

that is, the area behind Deer Park. This could not be reported on by ATC. The defendant was also required, in terms of the Exposition, to ensure that he was able to return to land at the Queenstown Airport by the detailed Figure 8 circuit if there was a problem with the aircraft prior to Tollgate.

[205] In CAR Part 121, Rule 121.153 provides:

- (a) A person performing an air operation must plan, perform and control a flight using meteorological information provided for aviation purposes by ... the holder of an aviation meteorological service organisation certificate ...

I find that this was a mandatory requirement on the defendant as PIC of PBN89. For the purposes of the defendant's take off from the Queenstown Airport on the day, the holder of the required certificate was the ATC Queenstown.

### **Cloud and pilot training**

[206] The Exposition (Volume C1 Flight Crew Route Guide) provides at 3A.2 for Aircraft Line Training and sets out the syllabus for line training for Queenstown operations approval. It requires each section to be completed and signed off. The section on departure notes:

- Difficulty in assessing weather conditions when on the ground looking up into mixed layers.
- Difficulty of asserting actual airborne visibility in rain conditions.
- No take off without clearly having enough visibility to comfortably return back to land. (This may sound basic but aircraft must not be forced into a prematurely IMC departure from a difficult position.)

### **Cloud and CCTV footage**

[207] The CCTV film (DISC 172107) shows the cloud cover existing over the period 17:21:07 to 17:25:20 on the day. I find from my consideration of this film that at:



- 17:21:07 The cloud cover on the right of the shot is low. The lower edge of the end of the Remarkables Range is not in cloud. In the Morven Hill/Slope Hill area the hills have their tops in cloud. Morven Hill is out of cloud but Slope Hill and Morven Hill are indistinct. To the left the cloud is lower and is against the hills.
- 17:22:35 To the north an outline of the Crown Terrace can be made out but the Crown Terrace itself is obscured by cloud and mist.
- 17:23:01 The hill to the left of the camera shot is free of cloud.
- 17:23:12 The lower end of the Remarkables Range is clear of cloud.
- 17:23:58 There is no noticeable change in cloud cover to the north.
- [208] CCTV camera data 17:09:20 onwards is shot off a moving camera from the terminal building which pans from right to left initially. The time recorded is from 17:09:20 to 17:24:28.
- 17:09:20 There is cloud on the foothills of the Remarkables. The cloud on the end of the Remarkables is around the top of that particular part of the Remarkables Range.
- 17:09:31 In the northern area the cloud is low. Little can be seen of the hills.
- 17:09:43 The immediate hill in that camera shot is free of cloud.
- 17:10:03 Little change to the north.
- 17:10:09 The cloud is slightly higher on the Remarkables to the right.
- 17:10:22 The southern valley is completely obscured by cloud.
- 17:10:28 The top of the Deer Park that can be seen is free of cloud.

17:10:52      There is no change to cloud coverage in the southern valley.

17:11:02      The cloud cover on the Remarkables Range has not lifted.

17:11:08      There is no noticeable change in the northern valley.

17:11:20      Again, no change.

17:11:38      The cloud cover is noticeably low. The hill in the shot is barely discernible.

17:11:48      The Remarkables, the cloud has lifted somewhat. I assess the lifting as only to a small extent.

17:11:58      A shot to the south. A marginal improvement in cloud cover can be seen.

17:12:32      If anything, the cloud cover is lower on the Remarkables Range.

17:12:40      On the back pan of the camera, the cloud cover on the Remarkables Range remains as before.

17:12:49      There is no noticeable improvement in cloud cover to the north.

17:12:59      Very little improvement in cloud cover to the south.

17:13:58      Very little change.

17:14:16      Little noticeable change.

17:15:00      The aircraft is by this stage in 'pushback'. The foothills of the Remarkables Range to the south have cloud, half to two thirds down the slope. Overall some limited improvement.

17:16:26      Little improvement if any in the southern valley.

- 17:16:35 The cloud on the part of the Remarkables Range closest to the airport has lifted but only to a small extent. No noticeable change to the cloud cover further along the Remarkables Range.
- 17:17:00 There is no noticeable improvement of the cloud cover on the Remarkables Range.
- 17:17:39 In the northern valley the cloud cover remains low. I could see the edges of the Morven Hill/Slope Hill hills but the hills remain indistinct.
- 17:20:42 The cloud cover to the north remains low. The hills outline is indistinct and the tops are obscured.
- 17:22:37 The aircraft is moving towards the Runway 23 threshold. The position of the cloud cover to the north remains unchanged.
- 17:24:14 The cloud cover remains low, similar to what has been seen earlier. Crown Terrace cannot be made out.
- 17:24:28 There is little change that is noted in the cloud cover in the southern valley next to Deer Park Heights.

[209] My perusal of the Christie video footage establishes that as the passengers were boarding there was wispy cloud to a low level “hanging” around Deer Park, but the top of Deer Park could be seen through the cloud. The cloud cover can be described as broken and patchy but it is low and is hanging. The shot taken down Frankton Arm (which is of very short duration) shows that area obscured in cloud. There is a further shot through the cockpit and the windscreen of the aircraft of cloud cover but I cannot say what the position of the plane or aircraft was at that time. In all, I find that the Christie footage on the issue is of little assistance.

[210] In relation to the CCTV footage I hold that in the 10 minutes leading up to the aircraft taking off there had been little improvement in the cloud cover; that the cloud cover in the southern valley remained low and to the north the immediate hills

were indistinct as a result of the low level of the cloud, the Crown Terrace was not visible. The CCTV footage overall establishes to my satisfaction that remaining cloud cover is low. I note that the footage is restricted to the southern valley, the Remarkables Range and the northern valley.

**The reported cloud conditions existing prior to and at the time of take off**

[211] The reported wind conditions are detailed in the transcript of the airways (ATC) radio and phone recordings for 22 June 2010 (the transcript document at Exhibit Folder 2, tab 47). The relevant excerpts are as follows:

4:35:32 PBN89 : Okay thank you. It just looks like there's a mini clearance behind Deer Park there, I don't know for how long.

4:36:20 QN : Yeah, just from here, just in the Arm, we can't see the narrows there, so it's probably about 4-5 k's in the cloud base, sort of scattered about 1200 and broken, overcast at 2000.

PBN89 : Yeah, roger that, that cross wind's got us at the moment anyway thanks.

QN : Yeah, 150 degrees 23 gusts 34 kts.

The ATIS message:

4:56:35 ATIS Automated Message – Queenstown information Quebec issued at 0433

Expect VOR/DME. Charlie approach, runway 23, runway conditions water patches, QNH 1017, surface wind 160 degrees 25 kts gusting 35 kts, visibility 8 km reducing 3000 metres, present weather heavy rain, cloud scattered 1200 ft, broken 2000 ft, temperature 3, 2.2, QNH 1017, forecast 2000 ft wind, 180 degrees 25 kts, on first contact with Queenstown Tower, notify receipt of Quebec.

(Underlining emphasis added.)

4:59:37 PBN89 and what your estimate of the visibility is?

QN : Okay, the 10 minute average on the wind, 170 degrees 21 kts with a low of 14 and a max of 36 and right at the moment it's 170 at 26 kts and visibility at the moment, it is probably slightly improved down the Arm, maybe up to 10-12 k's but on average it's probably still around the 5-8 k's.

5:02:52 PBN89...and Ground Bluebird 89, um, if possible, we're quite happy with, with the cloud and vis for that departure Bowen 4, 3 sorry, it's just the wind we're worried about ...

(Underlining emphasis added.)

QN : No. The last ATR diverted back to Christchurch and the cloud is actually, probably, on the Met station there, is indicating Broken at 1300, there may be patches higher than that. Visibility out, well certainly over Slope Hill itself, should be around 1500 to 2000 ft.

PBN89 : Yeah it's um, yeah 1300 probably not quite enough for us. We need about 1700 in the Tollgate area.

5:03:55 QN : Yes, stand by, we have to re-assess things with, cloud wise ...

5:06:41 QN : Yeah, just estimating the main base to be about now, broken about 1500 ft, and there are patches lower, especially in the, in the um Queenstown Bay area, Frankton Arm and possibly though, there may be patches slightly higher too in the Tollgate area and it does look like a wee bit of clearance there, but we're still putting it around 1500 ft.

(Underlining emphasis added.)

PBN89 : That's understood thanks yeah, we'd be reasonably happy with that ...

(Underlining emphasis added.)

5:09:55 (Phone Call) – Phone call to ATC Queenstown from unknown person.

There was a general discussion about PBN89 and then the comment is made by the caller after receiving the time for Civil Twilight as follows:

“Unknown 5:45..., but then with this cloud, mmm”

[212] ATIS :

5:14:00 ...zero kts, visibility one five km reducing 5 km, present weather rain cloud few, 800 ft, broken 1500 ft, overcast 2500 ft, temperature 3, Q.1, QNH1017, forecast 2000 ft, wind 180 degrees 25 kts, on first contact with Queenstown Tower notify receipt of Romeo

Queenstown Information Romeo issued at 0514. Expect VOR/DME, Charlie approach, runway 23, runway conditions water patches, QNH1017, surface wind 170 degrees, 20 kts gusting 30 kts, visibility one five km.

5:20:07 PBN89 has requested taxi and backtrack.

[213] Amongst the ongoing discussion between PBN89 and ATC is the following excerpt:

5:20:07

QN (Adam) Bluebird 89 that is correct, we have issued information Romeo, reflecting the cloud pretty much as described, few at

800 ft, broken 1500 ft, overcast 2500 ft, visibility now advertised as 15 km reducing to 5 km ...

ATIS Queenstown information Romeo issued at 0514 expect VOR/DME Charlie approach runway 23 runway conditions ..., present weather rain cloud few 800 ft, broken 1500 ft, overcast 2500 ft, ...

### **Other evidence given on cloud ceiling issues**

[214] Adam Sakareassen. It would appear to be common ground that Mr Sakareassen was the person responsible for providing the required weather conditions/cloud level information to PBN89. The informant's position in relation to the advice provided by Mr Sakareassen in terms of the CARs is that the defendant was required to comply with the requirements of CAR Part 121.153(a) in that he was required to plan his flight using that meteorological information. As per the NZAIP and the Exposition, there was a minimum cloud ceiling for departures of 2300 ft AGL and 5 km lateral visibility (the company minima lateral visibility requirement was 10 km). Mr Sakareassen's evidence was that the broken layer of cloud was at 1500 ft AGL and he confirmed in his evidence that his report that the middle layer in the Frankton Arm was, "reasonably accurate I think. It was quite well defined against Queenstown Hill". His "best estimate" was that the broken layer continued towards the northeast at "a similar height" of 1500 ft. Mr Sakareassen acknowledged in his brief of evidence and confirmed in his oral evidence, that the overcast layer reported as 2500 ft AGL was higher in the Tollgate area. Mr Sakareassen in his evidence confirmed the difficulty assessing cloud ceiling and noted that the ATC from the Tower had a better view of the Frankton Arm area than what the defendant would have had but that the view south of Deer Park was better from the runway 23 threshold. The re-assessment by Mr Sakareassen of the level of the overcast layer in the Tollgate area was an assessment made by him having been able to see the aircraft as it passed over that area and being able to assess its approximate height. The aircraft was used by him as a reference point. The 1500 ft level described by Mr Sakareassen was in the Frankton Arm and in the northeast area. Mr Sakareassen's evidence was that the aircraft had taken off when the cloud

level was below the minima. Mr Sakareassen was cross-examined by Mr Muir about an email he had sent on the day following the incident where Mr Sakareassen had reported that the conditions existing at the time the aircraft took off were the best they had been. Mr Sakareassen replied that the biggest improvement was prior to the ATIS Romeo having been given. Mr Sakareassen said that the ATIS Romeo would have been given within a period of less than 5 minutes from the observation and that at that point in time, albeit that conditions were improving, it was not improving at the rate that it had been earlier (prior to the ATIS being issued). Mr Sakareassen's evidence was that from the Romeo ATIS to the time he spoke to the crew at 5.20 pm there were no meaningful changes otherwise he would have discussed such changes with the crew. He acknowledged that the pilot had made a differing assessment of the cloud base.

[215] Daryl Robert Palmer, was the flight service specialist employed by Airways New Zealand in the Tower on the day. He was the person responsible for providing relevant information to the aircraft and updating the ATIS reports. He described the ATIS Romeo (issued at 5.14 pm) as having been updated to reflect the weather change from heavy rain to moderate rain and an improvement in visibility. The ATIS Romeo report applied when the aircraft departed and was the best assessment of the weather conditions at the time. Mr Palmer was questioned about his comment as reported in the Tower communications to the effect, "He's committed, he'll be gone, he won't be coming back", and said that it meant that "he" (the pilot) was not going to come back to do the Figure 8 circuit and that the pilot may have had some other options. He told Mr Pilditch that he thought that because "of the low cloud to the north of the aerodrome" (NOE page 79).

[216] Mr Daniel Debono was employed by the Queenstown Airport Authority. He had a view to the southeast and northeast. His evidence was that the cloud ceiling was 5000 to 6000 ft but that was "guesswork". When the CCTV footage was discussed with him, he confirmed that his estimate could not be offered with any accuracy. I put this part of his evidence to one side.

[217] Mr Robert Clark was driving at the time along Frankton Road to his home on Andrews Road. He was therefore positioned above lake level. He described the



conditions as “low lying cloud”, “low lying fog” and as “whiteout” conditions. His evidence was that the top of the Remarkables could not be seen and that the top of Deer Park Heights was under cloud. He said that the cloud went right across the Wakatipu Basin and that the cloud base was “solid”. Even after the CCTV footage was put to him, he was adamant that he was not able to see the very top of Deer Park Heights.

[218] Mr Ross Marsden’s evidence was based on observations from equipment based at the aerodrome. He stressed the independence that fact gave to his evidence. The report from Mr Marsden describes the use of a ceilometer. Between 4.40 pm and 7.40 pm the cloud ceiling over the airport lifted from 1200 ft to 2500 ft. The terrain generally, (ie) Kelvin Heights, mountains on the northern side of the Frankton Arm and above Queenstown, would have meant that the cloud ceiling in those areas would have been lower because the wind flow would be rising over the physical obstacles of the terrain. His evidence was that at 5.25 pm the cloud ceiling was overcast at 2000 ft over the airport, with lower patches probably 1000 ft along Kelvin Heights and on the mountains on the north side of Frankton Arm on Sunshine Bay. Mr Marsden’s evidence was that because of the nature of the terrain in the Queenstown area generally, differences can result with different types of weather being experienced in other parts of the Queenstown Basin with quite distinct changes in weather conditions from one place to another because of the terrain.

[219] Ms Lynn Cain was at her home at the time PBN89 was taking off. She described it as “extremely cloudy ... sort of misty cloud lower and it appeared to get thicker as it went up.” In describing the cloud at Deer Park Heights she said, “misty stuff” lower down but “getting darker” (as she put it) on the way up. She said she could not see the top of Deer Park. From her home she had an uninterrupted view of Tollgate. She looked for the aircraft as it passed to the east of Deer Park but never saw it.

[220] Mr Malcolm Officer was near Frankton at 4 Marina Drive. He had an elevated view over the Frankton Arm and down to the southwest/southeast. He described “thick cloud from Cecil Peak through to the Remarkables”. The cloud was

roughly half way down Deer Park Heights. When referred to the CCTV footage he repeated that he saw cloud covering Deer Park Heights.

[221] Mr Max Perkins described the cloud as “a blanket draped over the Frankton Arm, similar cloud base to the top of Queenstown Hill”. He said the clouds seemed to be meeting Queenstown Hill at some point and then said that the base was defined and extended to the west all the way to the end of the lake. He could not then recall how far. He heard the aircraft behind Deer Park and as it came overhead but did not see it again. In cross-examination he acknowledged the lapse of time upon his ability to recall. I found his evidence on this issue inconsistent.

[222] Mr Alan Kirker is a charter boat operator who had abandoned his charter operations on the day because of the prevailing conditions. He saw the aircraft (PBN89). His evidence was that he was concerned that he would have to use his boat to rescue people in the event that the aircraft crashed. He said that he saw a front coming from the south and described snowstorm/blizzard conditions which he described as a “whiteout”. Mr Kirker had Mr Marsden’s report put to him. It was suggested that he was mistaken about his evidence. He said he was not.

[223] Mr Andrew McKenzie described the situation as “very claggy” with low cloud and Deer Park covered in cloud. He put the front as a typical cold June southerly on a moment’s notice “barrelling up” the lake from Kingston. This deterioration was not at the airport, or at the Frankton Marina where his workshop was; rather he had seen it in Queenstown causing low visibility and an inability to see the other side of the lake. Deer Park was obscured, he said.

[224] First Officer Rush’s evidence was that from 5.00 pm there was a rapid improvement in cloud conditions; that the conditions were that there was claggy cloud hanging around the southwest but was more clearly defined around the Remarkables with Slope Hill being visible during the backtrack with the top of Morven Hill also being visible; the Crown Range being visible but with a misty layer. He considered that the terrain of the Remarkables was clearly visible, as was the top of Peninsula Hill. He said that the cloud base was around 4100 to 4500 ft QNH with a uniform layer of grey cloud down the Frankton Arm extending around

Peninsula Hill, with the top of Queenstown Hill being clear. The First Officer accepted that the cloud base from the Frankton Arm extended behind Deer Park into an area that had to be flown into as part of the visual departure and could not be seen. A good deal of First Officer Rush's evidence on this issue appeared to me to be inconsistent with what the CCTV footage showed the conditions to be.

[225] Mr Wales described the cloud in the Frankton Arm as a solid and defined layer between Deer Park Heights and Queenstown Hill but sitting higher than Deer Park Heights. His evidence was that the south was the area most clear of cloud and that to the north the cloud was breaking up. He said that he did not specifically focus on that area. He said that he saw the aircraft heading towards Slope Hill and entering cloud around the Slope Hill location, the aircraft being at 5000 to 6000 ft.

[226] Mr Glass saw the aircraft at 3000 to 4000 AGL at Tollgate, first seeing it in the southern valley more or less "at Duckpond" and the aircraft going overhead the airfield around 5000 ft QNH with cloud around the aircraft but the aircraft either above or beside the cloud; that the cloud level was well above the Remarkables knoll; the aircraft disappeared as it was headed towards Slope Hill behind a block of cumulus cloud. I have difficulty in accepting that Mr Glass could see the aircraft over Duckpond as his view of that area would be impeded by Deer Park.

[227] The defendant gave evidence. His evidence was that the front began to clear at approximately 4.45 pm. He noticed cloud lifting around Peninsula Hill, the Queenstown Basin and then around Jardines. His evidence was that up to 5.00 pm the cloud base against the Remarkables was at 4800 ft and that Slope Hill, Morven Hill, and the north-eastern part of Queenstown Hill were all clearly visible; that the base of the Crown Range could also be seen; that the top of Peninsula Hill was visible; that the cloud was breaking up over the airport. He described the "greater basin" with cloud 4500 to 4800 ft QNH with patches clinging to the hills being "somewhat lower". The defendant's evidence was that from the runway 23 threshold the broken layer of 1500 ft AGL cloud applied through the Frankton Arm but that there was an ability to see the Ben Lomond ridge 12 km away; that the 1500 ft layer in the Frankton Arm did not extend into the southern valley. That meant there was an unobstructed climb available in the valley, the main cloud base at 4500 to 5000 ft

QNH. The defendant's evidence was that he could see the relief of the Remarkables and the final slope of the Remarkables at the southern end of the valley and that he was certain that prior to departure the cloud base was more than 4500 to 5000 ft in 4/8ths of the sky.

[228] The evidence given by the defendant and the First Officer in relation to the height of the cloud cover at relevant times is not in accord with my observations from the CCTV footage. Indeed, having particular regard to the defendant's evidence in relation to Slope Hill, Morven Hill and the Crown Range throughout the period 5.00 pm to 5.25 pm, the defendant's evidence cannot be correct. Nor do I accept First Officer Rush's evidence on the height of the cloud base. Relying on the evidence of Mr Marsden and his equipment, the evidence of First Officer Rush as regards to being a rapid improvement in cloud conditions from 5.00 pm onwards must also be in error. My observations from the CCTV footage establish to my satisfaction that Slope Hill would not have been visible as such during the backtrack and that throughout the period the Crown Range was not visible in the way he described.

[229] In respect of the evidence of the other eye witnesses, I note the evidence of Mr Marsden in relation to the nature of the terrain around the Queenstown Basin causing different climatic conditions to occur in different areas. The differing positions from which the eye witnesses were observing meant that their views of what they could see of Deer Park Heights would have been different from their perspective and the climatic conditions existing in their particular location. The evidence establishes to my satisfaction that there was an area of cloud extending down Frankton Arm and around Peninsula Hill at a ceiling of approximately 1500 ft QNH. Depending on where the eye witnesses were making their observations from, that cloud could very well have obscured their view of the top of Deer Park Heights. I am satisfied on the evidence that I saw in the CCTV footage that the cloud base was less than minima at the time PBN89 commenced its take off roll.

[230] As a Class D airspace a pilot in Queenstown is required to maintain visual separation from other aircraft by avoiding cloud and specified minimum horizontal

and vertical distances are prescribed accordingly. The matter is aggravated here by the inability to assess the total cloud cover. It is made impossible by the existence of Deer Park which results in the southwest aspect not being able to be seen from the aerodrome.

[231] The informant makes the submission that to meet legal requirements the defendant was required, in respect of cloud conditions, to ensure prior to departure that he could meet the visual segment criteria and avoid entering IMC before Tollgate so as to maintain visual separation from the terrain. That assessment by him has to include that portion of the visual segment which could not be seen and which there was no ability for the ATC to report on. The defendant was also required, on the informant's case, to consider the possibility of having to undertake a Figure 8 circuit which would have again taken his aircraft behind Deer Park and that he therefore had to ensure the cloud base was of a sufficient height so as to allow him to complete the Figure 8 circuit visually and be able to return to land at Queenstown.

[232] There was a dispute in the evidence of the experts as to whether the Class D airspace VFR requirements bound the defendant. Captain Glasgow (at paragraph 182 of his brief of evidence) referred to CAR, part 91.301, Table 4 (ie, a requirement to fly clear of cloud by two kilometres horizontally and 500 ft vertically). Mr Hughes disputed that such requirements were "legal requirements" but on the issue of safety he agreed maintaining separation from cloud in this manner was a prudent and safe approach, but it was not a requirement.

[233] The issues however need not be resolved. There is no argument that the defendant could not enter IMC during the visual segment. Category D airspace requirements relate to the degree of separation between aircraft and cloud so there is no inadvertent proximity to other aircraft. The Exposition reminds pilots that the aerodrome is a Class D airspace. At the very least the Class D airspace VFR requirements were a good guide to avoid entering IMC. A breach of the requirements would have hindered a pilot's ability to maintain visibility in the environment.

[234] The Sakareassen re-assessment of the overcast layer in the Tollgate area occurred because when he could see the aircraft he presumed it to be at crossing altitude in the region of 4000 ft. The air traffic controller at that point had the benefit of the aircraft in the sky as a reference point to assess the altitude of the cloud ceiling. Without the reference point the assessment was difficult due to the nature of the cloud. The defendant's position could be no better.

[235] With reference back to CAR, part 1221.153 the cloud ceiling of 1500 ft AGL was not just marginally lower than what the defendant was required to comply with (ie, the NZAIP aerodrome minimum). Nor was it marginally lower than the visual reference minima imposed by the set heading altitude at Tollgate in the Exposition. In all the reports cloud ceiling was 800 ft below the aerodrome minimum and 929 ft below the minimum crossing altitude at Tollgate – on the defendant's argument in case at 3600 ft AMSL or 2429 AGL.

[236] The issue of the clearance being given by the ATC controller Sakareassen does not change the position. Under re-examination Mr Sakareassen's evidence was that the assessment of cloud was not on the controllers' report as the pilot had indicated that he had assessed the cloud as 'okay' for departure.

[237] I find, having assessed and considered all of the evidence given on the cloud base that at the time immediately preceding the departure of PBN89 the cloud base was below Queenstown minima. I refer to the ATC report and the evidence given by Mr Sakareassen. I note that Mr Sakareassen accepted that assessing the cloud ceiling was difficult but his evidence was that he had assessed the cloud as being below the minima. His evidence was that the 1500 ft base in the Frankton Arm extended into the Slope Hill and Morven Hill areas.

### **Cross Wind – the Exposition requirements**

[238] Paragraph 3-ZQN-1 of volume C1 Flight Crew Route Guide Introduction provides that the "Queenstown Route Guide contains information specific to company Boeing 737 operations into and out of Queenstown ZQN"

[239] There is no real dispute between the informant and the defendant in relation to the Exposition's cross wind limitation.

- Paragraph 3-ZQN-7 "Operating Requirements", paragraph 3-ZQN-7.9 says:

**3-ZQN-7.9 Crosswinds Limitation**

Maximum cross wind in dry conditions is 27 kts and 16 kts if the runway is wet.

- Paragraph 3-ZQN-5.2 "Wind Characteristics" says (inter alia):

Weather observations are made during the daytime by Airways personnel and are only representative of the Basin area in which the airport is situated.

Observations from the several windsocks show little consistency in the direction of the wind on the airport. Experience has shown that the wind at the anemometer is not very representative of the surface wind at other points on the airport.

[240] Under "WARNING" at paragraph 3-ZQN-6.2, the warning contains the following:

**ADVERSE CONDITIONS**

SEVERE TURBULENCE, DOWNDRAUGHTS AND WINDSHEAR CAN BE EXPERIENCED WITHIN THE QUEENSTOWN BASIN BELOW 4000 FT.

**TERRAIN**

QUEENSTOWN AERODROME IS SURROUNDED BY MOUNTAINOUS TERRAIN.

REMARKABLES RANGE TO THE SOUTH-EAST OF THE AERODROME INFRINGES THE CIRCLING AREA...

[241] The document "Operational Manual (Part A) Volume A1 : Flight Crew Operating Manual" provides at 3.1.2 under 'Flight Crew General Operations Operating Policy' :

It is general Pacific Blue policy to use the aircraft's manufacturer procedure wherever practicable. In the case of a discrepancy between documents, the Pacific Blue manuals take precedence.

Earlier in the same document under paragraph 0.12.6 “Adherence to Operations Manuals Suite” it is stated that:

The rules, regulations, procedures, and operational instructions contained in the Operations Manual shall be adhered to by the relevant Pacific Blue personnel at all times.

[242] I find that the above instructions are consistent with CAR Part 121.7 Procedure Compliance, which requires that an air operation shall be performed in conformance with the applicable procedures in the Exposition.

[243] I am also mindful of CAR Part 121.153 which (as I have found earlier) places a mandatory requirement on a person performing an air operation to plan, perform and control the flight using the meteorological information provided (in this case) by the ATC. I also note that the document, Flight Crew Operating Manual Volume A1, in paragraph 7.2.4 deals with 30 m Wide Runway Operations. Under 7.2.4(c) the attention (of the pilot) is specifically drawn to detailed issues including:

- There are specific crosswind limitations for the B737-800 (there are no variations in the crosswind limits because of winglets).

The same paragraph under 7.2.4(a) confirms that Pacific Blue aircraft had been issued with an Airplane Flight Manual Supplement authorising operations to narrow runways (that is runways of less than 45m but not less than 30m in width). The cross wind limitation is detailed in paragraph 7.1.8 where a table establishes limits for take off for wet runways of 30m a limit of 16 kts of cross wind.

[244] For the purposes of clarity the policy for normal operating procedures is detailed and in paragraph 7.2.1(a) (inter alia) it states:

Due to regional requirements there are some variations to this policy and, in some case, the Boeing policy requires elaboration or interpretation. This section contains Pacific Blue procedures for normal operations and should be read in conjunction with the company issued Boeing operations manuals.

And under 7.2.1(c)



All pilots must adhere to the SOPs. However the company recognises that SOPs cannot cater for all situations and hence, in exceptional circumstances, the Captain may act as required by the situation. (the underlining is mine)

[245] The defence expert, Captain Julian, discussed the preface of the same document at paragraph P.1.1 where the purpose of the Manual is stated to be:

To ...detail the directions, policies, and procedures for the use and guidance of flight and cabin crew when performing their duties for the airline.

Captain Julian stressed the documents as being for “use and guidance”.

[246] With respect to Captain Julian’s opinion, I do not see that that purpose derogates in any way from the mandatory nature of the SOPs as detailed in the manual and the provisions of CAR Part 121.7 requiring mandatory conformation to the applicable procedure specified in the Exposition. I do not accept Captain Julian’s view that the Exposition is just there for use and guidance as such. It clearly contains mandatory requirements that pilots are required to follow. I am fully satisfied on this point through my analysis of the relevant provisions of the CAA 1990, the CARs and the documents comprising the Exposition. In fairness to Captain Julian, I note that he agreed under cross-examination that the defendant was required to comply with the 16 kt restriction and agreed that although the 16 kt cross wind was conservative it was open for the operator to be conservative.

[247] I accept the reasoning behind the imposition of such a cross wind limitation and the evidence in that regard. It is clearly there to prevent the risk of a runway excursion. Despite the evidence from the experts that such a runway excursion was entirely improbable, I do not accept the view of Captain Julian that such a suggestion was implausible. In the end, in my view after considering all of the expert testimony, it is not a matter of mathematics or the co-efficient of friction. It is a clear risk that has been recognised and identified by the designers and engineers of the Exposition for Boeing 737 operations at Queenstown. The limitation takes into account the terrain; the nature of the surrounding winds; and meteorological conditions that exist as a result of the mountains surrounding Queenstown. Further, I find that the risk of runway excursions upon a take off having to be aborted prior to V1 means that

regard has to be had to the whole of the runway when considering the cross wind limitation because the risk would then continue for the full length of the runway.

[248] It is also clear in the evidence that pilots have training of a kind that enables them to assess the weather conditions pertaining. Indeed, pilots must assess the weather. The providers of meteorological services such as, in this case, the ATC, however, are not only trained weather observers but also control, view and use calibrated equipment (maintained as to their accuracy) in relation to the weather.

[249] As I have found earlier in this decision CAR 121.153 places a positive onus on persons planning, conducting or controlling flights to use meteorological information from the approved source. The wording of CAR 121.153 appears to me to place this onus as a mandatory requirement on persons such as the defendant when planning, performing and controlling a flight.

[250] I find that I am fully in accord with the witness, Mr Hughes where, in his evidence, he described the position as a pilot having his or her discretion bounded in relation to the assessment of the weather. The weather reports received by persons in the position of the defendant from a meteorological or Part 174 service provider can never be disregarded. I hold accordingly. It would be open for the pilot to be more conservative and therefore more risk-avoidant, but certainly in my view a pilot could not use his own visual observations and exclude the meteorological information.

[251] Mr Muir on behalf of the defendant accepted in his closing submissions that the runway at Queenstown was wet at the time and that the runway was a 30 metre runway. He remarked that the manufacturer (Boeing's) demonstrated cross wind capacity for the aircraft is 25 kts and pointed to the Boeing Flight Crew Operations Manual for Pacific Blue which forms part of the Exposition. I note his submissions.

### **The evidence on cross winds**

[252] Mr Pilditch in his closing submissions (paragraph 5.41) included a table detailing the one minute interval cross wind components taken from the witness Mr Marsden's report. It is submitted that analysis establishes:

- At 5.25 pm the one minute average wind speed at 16.6; lulls at 13.5; one minute gusts at 19.1.
- At 5.24 pm, (one minute prior to the take off roll) the one minute average wind speed at 12.5; lulls at 10.3; one minute gust at 16.6.
- At 5.26 pm the one minute average was 14.6; lulls at 12.0; one minute gust at 18.7.

My analysis of the table establishes that prior to the aircraft take off roll commencing there was only a one minute period where the cross wind component did not exceed the limitation of 16 kts and that was at 5.24 pm.

- At 5.25 pm, one minute after the take off roll, the cross wind maximum gust is 19.1 kt.

I find that this evidence from Mr Marsden supports the information supplied to the crew of PBN89 at ATC when the take off clearance was provided.

[253] The defence provides tables at paragraph 9.12 and 9.13 as regards to the cross wind assessment. This is based on the MET Service Hind Cast Report. The tables contain the average cross wind component. Mr Muir at paragraph 9.15 of his closing submission said, "...it is accepted that the average cross wind at 17:25, reflecting the minute previously was between 16-17 kts..."

[254] I find in relation to the competing arguments there is a strong element of "hindsight" being used in both. The defendant was required to act upon the information available to him at the time. That particularly came from:

- i. the advice from the ATC
- ii. the defendant and his First Officer's observations

- iii. the windsocks which have been given a degree of prominence in the defence case as to the assessments made of them by the defendant as PIC.

### **Tower Communications**

[255] I refer to relevant parts of recorded communications from and to the ATC and PBN89. (I refer to Exhibits Folder 2, Tab 47.)

#### Time

- 4.35.32 Enquiry from PBN89 wondering what the wind was and asking “Is it still up round the, that 30 mark?”

PBN89 were advised by the Tower that, “It is pretty much all cross wind, ah, yeah, maxing at this stage, looks like about 32 kts.”

- 4.36.20 PBN89 advises that “...that cross wind’s got us at the moment anyway thanks.”

The answer from ATC was “Yeah 150° 23 plus 34 kts.”

The Quebec ATIS at 4.56.35 in relation to wind stated:

“...surface wind 160° 25 kts gusting 35 kts ...”

ATIS Quebec stated that it had been “...issued at 0433 ..”.

- 4.59.37 PBN89 asks for an update of the wind over the last “...4 to 5 minutes there please..”.

ATC advises:

...the 10 minute average on the wind, 170° 21 kts with a lull of 14 and a max of 35 and right at the moment it’s 170° at 26 kts ..

- 5.02.52 PBN89 advises that it was “...just the wind we’re worried about..”.

5.02.53 ATC advises in relation to wind as follows:

...wind at the moment, instantaneous, pretty much the same at both ends, actually we're just getting quite a strong gust through now, 170° at 23 kts and we've just had a gust of 28 kts just then.

5.06.41 PBN89 advises ATC that they had "...a 16 kt limit" and then confirming when asked by ATC that the limitation was a 16 kt maximum cross wind.

5.08.00 ATC advises PBN89 that the cross wind was averaging about "...probably around 15 maybe up to 16 kts, sometimes it gets a wee bit lower than that, but we're still getting the occasional gusts up to, for the last 10 minutes, there has been 27 kts."

5.08.52 ATC advises, "...the 2 minute average for 180°, averaging 19 kts, a lull of 12, gust of 27, and there ah actually the 10 minutes is pretty much the same, and most of that is actually pretty much cross wind as well.

5.10.51 PBN89 advises that they were going to taxi to the "...end there.." to position themselves "...for a go..." should the wind abate.

5.14.0 Romeo ATIS advises in relation to wind as follows, "...wind 180° 25 kts,.." and then "...runway 23, runway conditions water patches, -- surface wind 170° 20 kts gusting 30 kts, .." ATIS Romeo was issued at 0514.

5.20.07 ATC confirms the issuing of "information Romeo" and puts the wind at "...170° 20 kts, gusting to 30 kts at times."

5.24.19 Following a request from PBN89, ATC advises "the wind at the 23 threshold 180° 17 kts. We've just had a gust come through 05 threshold 150° 28 kts".

5.24.38 The take off clearance included the following advice from the ATC:

Bluebird 89 roger. And it's gusty at both ends, at 180° 25 kts, runway 23 cleared for take off.

[256] An analysis of that information establishes in my view that the information being received by the defendant was that the cross wind as reported by the ATC was constantly in excess of the 16 kt cross wind limitation. My conclusion of the ATC advice confirms to me that the advice that the defendant was receiving included information that the velocity of wind gusts were very high. The advice generally about the cross wind was:

5.08.00 Cross wind averaging about 15 maybe up to 16 kts but with gusts up to 27 kts.

5.08.52 ATC advises PBN89 that the 2 minute average was 19 kts with gusts of 27, with the 10 minute average similar.

5.10.51 There had been little change. PBN89 taxiing to the "end there" to see whether the wind "abated".

5.14.0 Romeo ATIS confirms that there had been little abatement in the wind and that the gusts were 30 kts, the wind at 20 kts.

5.24.19 Within the immediacy of take off the threshold at 180° was 17 kts and gusts at the 05 threshold were 25 kts at 150°.

5.24.38 It was gusty at both ends, 25 kts of wind.

[257] I find that on the evidence there does not appear to be any form of abatement recognisable in the wind being reported to the defendant by ATC. The reports being received by the defendant from ATC indicated that the cross wind was in excess of the minima. The evidence of Mr Marsden confirms the information that was being relayed by ATC to PBN89. (I note that there was no question raised by the defendant with ATC witnesses as regards to what the defendant says he was observing from the windsock).

[258] Mr Muir in his closing submissions took issue at paragraph 9.22 as regards to ATC reporting “instantaneous” winds rather than a 2 minute wind average. I find that the information supplied from ATC to PBN89 told the defendant the base for the winds report, ie either 2 minute average or 10 minute average. I do not accept the submission made by Mr Muir that the quotation of instantaneous wind would undermine the relevance of the ATC information. There is no evidence that the defendant on the day in question came to his decision on the wind levels on the basis that the ATC reports were incorrectly using instantaneous winds. The take off clearance at 17.24.38 containing the cross wind component at 19 kts is a report that was accepted by both the defendant and First Officer Rush.

[259] Mr Muir spent some time in his closing dealing with his conclusions of how ATC had arrived at the wind values that were reported. He pointed to the cross-examination of Captains’ Glasgow and Hughes and alleged discrepancies. I have considered those submissions and the evidence upon which the submissions are based. In the end I did not find the outlined evidence overly helpful to my decision. I had to consider what was occurring at the time before the departure of PBN89 and I did not dwell on detailed analysis given with the benefit of hindsight and not available to the defendant on the day. (The analysis of the ATC reports and the ATIS as previously detailed in this decision do not appear to support this evidence).

### **First Officer Rush**

[260] The earlier criticisms of this witness’s evidence are relevant to my assessment of First Officer Rush’s evidence on the cross wind issue. First Officer Rush had very limited training or experience in respect of flying into and out of Queenstown airport. His evidence was however very “caustic” of the requirements contained in respect of the special Queenstown procedures should there be an engine failure prior to Tollgate the overall operation in and out of Queenstown (in a general sense). His evidence (NOE 1305) was that the windsock that could be seen at the gate and in listening to ATIS and taking into account “the controller’s response with regard to the wind” established to his satisfaction that the net wind velocity was decreasing, the average was coming down, and that the duration of the gusts was shorter with lulls increasing. His evidence (NOE 1306) was of concern. I quote as follows:

Q The paragraph at the top of that page about the windsocks and the anemometers, what was your understanding of the implication of that paragraph?

A Essentially it caused me to distrust the ah, ah, the ah reading from the anemometer that the controller was giving us.

Q Why would you distrust something that was a scientific instruction?

A Because a windsock is a scientific instrument as well. It disagreed with my observations, sir. There was clearly not a uniformity of information coming whichever way I looked at it and I preferred to rely on my own observations and the quality of my observations were paramount.

Further:

...you know the wind was coming down and that a departure would nevertheless be possible, um in association, in association with the improving weather conditions in terms of minima out amongst the various reference points that we had to, ah, check the cloud against. We were satisfied that the weather was coming together to permit a departure and, ah, at that point I advised ah, my set in effect of Captain Gunn that if we were going to be in a position to depart we would need to be down at the threshold and ah from there we could get a better assessment of the ah wind without the obstructions of the terminal and equipment around us and we could get a further wind check so I put that to Captain Gunn and he agreed with my assessment.

[261] The evidence then from First Officer Rush was that he was observing from the threshold for a period of time, making observations about cloud cover and the wind. The First Officer said that he did a calculation from the communication from ATC at 5:24:19 and made the rather surprising observation that the reported 05 threshold gust at 28 kts was observed by him “coming through” at a lesser velocity. (He was making this observation looking down a runway in poor light and poor weather conditions. I have found this evidence difficult to accept as true.) His evidence overall was that he had disregarded the information from the ATC; that he had a distrust of anemometer readings; and that the 16 kt cross wind limitation had no “scientific basis”. He did not see the 16 kt cross wind limit as a safety issue and that the gust at the 05 threshold was irrelevant. His evidence (NOE 1312) was:

The gust at the 05 threshold end was – we simply were not going to be on the ground at that end. It was completely irrelevant what was happening at the 05 threshold end...



(This evidence ignores a shut down prior to V1.)

[262] First Officer Rush did not appear to take into account the reason for the 16 kt limitation. I took his evidence overall as regards to the ATC reports as that “he knew better”. An alarming position in my view.

### **The defendant’s evidence**

[263] The defendant’s evidence in relation to the use of ATC’s advice of 5:24:19 at the 23 threshold, was that he considered the winds were 2 minute averages and what he saw from the windsock indicated a wind of about 45° at 15 to 20 kts. He says that it was indicating to him that the cross wind was within the limits for take off of the aircraft. He explained (NOE 1085) his view of gusts and that he felt that from his observations there was a “pattern” and that he formed the view that there was a 30 to 40 second ability to take off when there would not be any gusts. He was of the view that the wind was decreasing. He agreed that it was or had been gusty. He was asked (NOE 1086):

Q     What is your best estimate of the cross wind that the aircraft was dealing with during its departure roll and rotation?

A     I would say just in excess of 10 kts, but certainly less than -well it was certainly less than 19 that’s claimed, but you can’t, I can’t speak with any accuracy to kts, but what I can speak to some degree of accuracy I think is to say it was certainly less than 20 kts and certainly less than anything that may limit the performance of the aeroplane in terms of control.

[264] His evidence generally was that he had assumed certain matters from what he had been told by ATC and from the reports. It was clear in his evidence that he did not take any of these matters up with ATC nor did he attempt to clarify the situation. He also placed great emphasis on the wind sock, but he did not describe it, as First Officer Rush had, as a “scientific instrument”.

[265] The defence have put the windsocks as primary reference tools as they are consistent and accurate in relation to wind direction. Certainly on the evidence in respect of wind direction that is correct to a certain extent. However, I take some issue with the suggestion that because of the design of the windsock there can be any

form of exactness in calculating wind velocity from them to an operational degree of accuracy when dealing with the Queenstown scenario as expressed in the Exposition. It is of some interest that the defendant at the 23 threshold described the windsock from his position in the aircraft indicating to him that there was 15 to 20 kts of wind at 45°. First Officer Rush's estimation was 15 kts at 30°.

[266] The evidence of both the defendant and First Officer Rush was that at the gate the windsock that they could see indicated that the wind overall was decreasing. An analysis of that windsock from the CCTV video establishes to my satisfaction that between 17:09:31 through to 17:17:39, that particular windsock remained at a reasonably consistent angle and size, (ie, the amount of wind in it); other than at 17:09:32 when there was a reasonably noticeable but brief fall off in the angle of the windsock. For the remaining period of time the windsock was at a constant half to two thirds full angle. The wind direction did not appear to vary to any great degree, albeit that that was hard to assess from the CCTV footage.

[267] First Officer Rush's disregard of the reports from ATC appear on his evidence to originate from the Queenstown wind characteristics (as described in Volume C1 : Flight Crew Route Guide 3-ZQN-3 at 3-ZQN-5.2) as the anemometer not being very representative of the surface wind. This is, in my view, a clear indication to pilots to exercise caution in the assessment of wind because of its unpredictability at Queenstown. That is not, however, to the point and effect that the anemometers are inaccurate. Indeed the evidence that I have heard establishes that the anemometers and the equipment used was properly maintained and calibrated. If windsocks are not consistent with wind direction they also may not be consistent with wind velocity. Against that, there the windsocks are subject to issues relating to the weather conditions overall, for example wet weather equalling wet windsocks equalling heavier windsocks; the movement of the windsock; and the difficulty in assessing actual wind speed from them when they are not filling well because of their damp condition. The windsocks are not scientific, calibrated devices. I find that they are indicators and commonsense dictates information from them must be treated carefully in the assessment process when contradicting information from calibrated wind measuring devices.

[268] Here the aircraft departed at 5.25 pm. An analysis of the CCTV footage shows that the aircraft was at the end of the runway and turning to its right at 17:24:10 facing down the runway by 17:24:20. It appeared to be in its take off roll by 17:25:09. That allows for a period of 49 seconds standing at the runway 23 threshold. It would appear to me to be a very short period for the First Officer, for example, to have made the mathematical calculations that he described in his evidence, let alone making objective observations and decisions concerning the wind velocity and cross wind element as both First Officer Rush and the defendant's evidence indicate that they did. The emphasis that was placed in the overall evidence of First Officer Rush and the defendant, as they came to the decision that the windsock evidence showed to them that the cross wind was under the minima, is in my view not borne out by the actual amount of time that was in fact available for the steps to be taken at the threshold of runway 23.

[269] I therefore do not accept the submission made on behalf of the defence that the analysis and accuracy of the defendant's interpretation of the windsock information was confirmed by the evidence of the actual take off assists me. That seems to me to be a matter of good fortune. I have to assess the defendant's position on the information available to him in fact at the time he made his decision to commence the take off roll.

[270] At NOE 1186 there are the following questions and answers. The defendant is being cross-examined by Mr Pilditch from line 10:

- Q. Can I suggest to you that in the circumstances where, irrespective of you believe it's an instantaneous or a two minute average, you're being told that there's 18 kts of cross wind out there somewhere? Would it not have been prudent to go with that information at the time?
- A. I can only go back to what I said. The final assessment of the wind on the take off roll was made from the windsock immediately adjacent to where I was about to roll.
- Q. So can we agree that you disregarded the information that you were provided at take off clearance? That's the position?
- A. Yes, I – well, it wasn't the final driver for the decision.

THE COURT

Q. Well answer the question that you've just been asked. Can you put it again, please?

A. Yes.

CROSS-EXAMINATION CONTINUES: MR PILDITCH

Q. Can we agree that you disregarded the information that you were provided with a take off clearance?

A. Yes.

Q. In favour of the windsock?

A. Yes.

[271] Mr Muir submits (paragraph 9.34) that this must be considered in the context of the defendant's "total evidence". It is correct that earlier in the cross-examination the defendant had said that he did not disregard the information from the Tower (ATC) but as the cross-examination continues the defendant's position changes. I found the quoted questions and answers telling against the defendant. In this regard I also noted Officer Rush's evidence as to disregarding the ATC information.

[272] I find that it is clear on the evidence that the defendant did disregard the ATC advice in favour of his own subjective interpretation of windsock information. I find that because of the nature of the prevailing weather conditions at the time, any assessment of wind velocity, particularly cross wind assessment, would have been a difficult exercise. The corresponding information from ATC is recorded and thus can be analysed. That information disputes the assertion on the part of First Officer Rush and the defendant that the wind was decreasing and that the gusts could be "timed". The defendant in my finding was doing no more than guessing. I further find that the defendant was required in terms of the CARs and in terms of the Exposition to ensure that the cross wind limitation was not breached.

[273] I find on the evidence available to me that I accept that the cross wind limitation was so breached as at the time of departure. The cross wind, as shown in the table put in by the informant, was in excess of the limitation. However, if I am wrong in that I am more than satisfied the PIC (ie, the defendant) had a clear duty

not to expose the aircraft and its passengers to an undue level of risk. The defendant on the evidence from the meteorological reports, which I find to be accurate, reliable and objective information based on tested and calibrated equipment, chose to ignore the strong focus on cross winds being in excess of the 16 kt limitation to use his own subjective analysis from fluctuating windssocks. At the time that the defendant decided to depart, he must have been aware that the chances of a cross wind gust in excess of the limitation was relatively high on the information that had been made available to him. That caution would have at the very least required him to discuss and consider with the ATC representative giving the information his own personal observations of the position. He did not do so.

### **Wing anti-ice – altitude at Tollgate**

[274] Here the case for the informant against the defendant is that the defendant in his planning of this departure did not allow an increment for the possible use of wing anti-ice when setting the height required for the aircraft to pass over the position, Tollgate.

[275] The informant's argument begins with the Exposition. It relates to the Queenstown Special Procedures (see Volume C 7.2 Airport Analysis (B737-800W) (Exhibit Folder 3, Tab 3).

[276] At paragraph ZQN-9 and paragraph ZQN-3 the document under the tab "Special Procedures – Queenstown" has the heading, "All Engines Operating RWY23". It is the Bowen Three departure table. As part of the calculations the altitude overhead at TOLGE in feet QNH with the aircraft weight of 62 shows the following:

'Bleed' ON     3300 ft  
'Bleed' OFF    3200 ft  
For anti-ice engine only add 300 ft to the above altitudes  
For anti-ice engine and wing add 1100 ft to the above altitudes.

[277] The informant argues that because of the conditions pertaining in Queenstown on the evening in question there needed to be as an allowance for engine and wing anti-ice, an add-on of 1100 ft to the Bleed ON altitude overhead

TOLGE of 3300 ft, therefore resulting in a required altitude of 4400 ft AMSL at that point. In response the defendant argues that as PIC the defendant was correct in making an allowance in his altitude calculation only for engine anti-ice then adding 300 ft, with the applicable crossing altitude at Tollgate being 3600 ft AMSL.

[278] By the end of the evidence the parties put in as an agreed fact that the aircraft passed Tollgate at 4000 ft AMSL.

[279] I note that the NZAIP (Exhibits Folder 2, Tab 33) Bowen Three departure NZQNAD2-62.1 requires a minimum height of 3800 ft at Tollgate. The informant accepts that the defendant achieved that height but argues that the Exposition requires a greater height by the addition of 1100 ft to the 3300 ft Bleed ON for anti-ice systems use on both the wing and the engine. There is no argument that the aircraft in question had the appropriate anti-ice systems available. Wing anti-ice can be used as an anti-icer or a de-icer. The use of the wing anti-ice degrades performance. It is not a relevant issue in this case as to whether wing anti-ice would need to be used as an anti-icer or a de-icer.

[280] I have already discussed earlier in this decision the relevant meteorological conditions. I take note that the time for a decision on the required crossing height had to be made in the planning stages of the departure. I find that my assessment of the evidence confirms there does not appear to be any issue that at or about the time of such planning the ground temperature at Queenstown was +3°; that there was visible moisture cloud and rain; that there had been a recent front in the vicinity of the airport. I find that with all of those factors taken into account and with the aircraft gaining altitude, the temperatures that the aircraft would be flying through after take off would be below freezing.

[281] The specific data detailed in the Exposition requiring the consideration of an 1100 ft height addition for wing anti-ice is, in my view, notable for the fact that the persons planning and confirming the detail of the Exposition rules considered that the Queenstown conditions were such that a wing anti-ice adjustment needed to be considered when assessing crossing altitude. There is therefore in my view a necessity for a pilot to carefully and objectively consider whether there was a need

not only for the use of engine anti-ice but also for wing anti-ice. The informant's position is that at this time of the year and at this time of the day with conditions of near-freezing temperatures on the ground, the existence of icing conditions as the aircraft was climbing was self-evident. Captain Glasgow for the informant went as far as saying that the conditions were such that if on this day a pilot was not going to make an allowance for the use of wing anti-ice, then he (Captain Glasgow) did not know when a pilot would do so.

[282] The informant's position is premised on the basis that Queenstown special operating conditions require the pilot to take into account the overall conditions with the potential of icing existing and the ability of the aircraft such as PBN89 to use both engine and wing anti-ice. This is argued on the basis that the reasonable and prudent pilot would select the higher crossing altitude so that if there was a need to use the wing anti-ice ability of the aircraft then it could be so used. The possibility of ice degrading the performance of the aircraft on the critical climb, submits the informant, was a real possibility and had to be given allowance in the calculations of the Tollgate crossing altitude.

[283] The defence argument is that in reality there is no need for the wing anti-ice function to be used in aircraft such as the aircraft being flown on this occasion. The history of each of the experienced pilots called to give evidence was to the point and effect that not one of such pilots would have used wing anti-ice in the initial climb out. In other circumstances there has only been very limited use of wing anti-ice in the aircraft operation. Captain Gunn's evidence was that he had not used wing anti-ice despite having flown extensively with frontal conditions, snow and sub-zero temperatures at night time and in cloud at sub-zero temperatures. Mr Muir, in paragraph 10.6 of his submissions, also relies on Captain Julian's evidence. Captain Julian has qualifications, extensive background and experience in regard to 737 operations including in and out of Queenstown. He would not use wing anti-ice. Further, the defence submits that it is a matter for the discretion and experience of the PIC as to whether there should be wing anti-ice applied. The point being made by the defence is that the Exposition does not require it but, rather, makes it as a "discretionary element". The defence, on the basis of the expert evidence, argues that there was not a need to add height for a wing anti-ice element. There were no

Sigmets, no indication from the TAF regarding icing phenomena or severe icing conditions, and when the aircraft arrived into Queenstown through cloud cover 20,000 to 10,000 ft with conditions below zero, there was no icing; that the frontal system had moved rapidly away; there was no weather, as Mr Muir puts it, “on the radar or anything” (10.13(b) defence submissions); and that in any event wing anti-ice is not truly effective when the wing leading edge and trailing edge devices are extended as they would be. Because of the restriction requiring a 180 kt IAS for radial 252 it would result, says the defence, in the potential operation of the wing anti-ice system being greatly diminished. The defence also relies on the light weight of the aircraft, putting it on the basis of a truly improbable scenario that there was a need to have anti-ice operating.

[284] The Flight Crew Operations Manual (tab 5, Volume 3) states at p SP 16.5 that:

Wing anti-ice should be used on all ground operations between the start of the engines and take off when icing conditions exist or anticipated.

The conditions existing at Queenstown with +3° temperatures put the requirement for wing anti-ice on the ground into place. On the overall evidence available at the time the defendant was planning his departure it is clear that there were indications of freezing temperatures during the climb out. This evidence relates to the prevailing conditions at the time of the departure and the ground temperature at the time. In relation to engine anti-ice operation on the ground there is a mandatory requirement that engine anti-ice is selected after both engines have started and that that engine anti-ice is to remain on during all ground operations when icing conditions exist or are anticipated.

[285] I note the difference in the instructions in the Flight Crew Operations Manual in respect of the use on the ground of wing and engine anti-ice. Engine anti-ice is subject to a mandatory instruction whereas the wing anti-ice is not.

[286] In relation to in-flight operations (see page SP.16.11) wing anti-ice operation in flight is described as



...the wing anti-ice system may be used as a de-icer or as an anti-icer. The primary method is to use it as a de-icer by allowing ice to accumulate before turning wing anti-ice on.

Further on the same page the document states:

The secondary method is to use wing anti-ice before ice accumulation, operate the wing anti-ice system as anti-icer only during extended operations in moderate or severe icing conditions such as holding.

At page SP.16.9 in respect of engine anti-ice operation in flight the instruction was again mandatory. It is worded as follows:

Engine anti-ice must be on during all flight operations when icing conditions exist or anticipated ...

When operating in areas of possible icing, activate engine anti-ice before entering icing conditions.

Again, there is the clear differentiation in terminology as between wing anti-ice and engine anti-ice, one being discretionary and one being mandatory.

[287] The overall conditions that have been discussed earlier in this decision, in my mind, would raise an enquiry in the prudent pilot as to whether there was a need for wing anti-ice to be allowed for. The use of engine anti-ice would be mandatorily required.

[288] When I have regard to the evidence of the experts it did not appear to me that they were giving evidence on the basis that they had flown in similar weather conditions at similar times of the year at a similar time of the day out of Queenstown. I take that into account in assessing the weight of their evidence overall on this issue.

[289] In my view it was a matter that needed to be given close consideration by the defendant, Captain Gunn, when doing his planning. Captain Gunn's evidence was that he had never used wing anti-ice in his flying career involving 737 aircrafts. He said that he was of a view that the 737 airframe was not susceptible to icing. The defendant accepted that there would have been no problems with planning for the use of wing anti-ice other than the addition of height, but that could easily have been

avoided by changing the departure procedures that were to be used. He then gave what I personally consider to be surprising evidence (NOE 1250/10) when he said that "...the use of wing anti-ice was not something a pilot would normally consider in normal line operations" and (NOE 1251) where he said "...it's not something that, that crosses the average pilot's or any pilot's horizon." The defendant's evidence in relation to the use of wing anti-ice was supported by the informant's experts. I acknowledge that those experts have had considerable flying experience, particularly in 737 aircraft.

[290] In the end, the defendant elected not to assess the required Tollgate crossing altitude at a height which included an allowance for wing anti-ice. At the time that he selected the appropriate crossing altitude at Tollgate he would have been aware of the existing climatic conditions and those climatic conditions must, in my view, have required him to consider the question of the possibility of icing conditions existing during the climb out part of the departure he was planning. In my view it is not a question of whether or not the wing anti-ice would have been used, but rather a question whether at that time of the day leaving Queenstown with a ground temperature of 3° there was a reasonable possibility that there would have been performance degradation of the aircraft as a result of wing ice and therefore a need to make an allowance for its possible use.

[291] After having considered the evidence overall, I would consider that there would have been a reasonable possibility of such degradation occurring, despite the use of the trailing edge of the wings and the impact of such upon the wing anti-ice, and despite the evidence that supports the view that an aircraft of this kind does not accumulate ice on its wing. I note in that regard that there is no suggestion of that being the case in the Exposition. There is evidence from the experts called in this case. However, there is no report or dedicated research establishing that 737-800 aircraft do not accumulate ice on their wings. Rather, the Exposition addresses the possibility of wing ice accumulating. I also note that other airlines have seen fit to include an allowance in their set minima Tollgate crossing altitudes, the allowance being for the use of wing anti-ice.

[292] I accept the argument that it is a matter of discretion for the PIC but that discretion has to be exercised reasonably, not on the basis of a closed mind on the ability of the aircraft's wings to attract ice accumulation. There is always the possibility of that occurring. In my view, a reasonable and prudent pilot would have considered whether there should be an allowance for wing anti-ice and in the weather conditions pertaining would have established a higher altitude for the Tollgate crossing.

### **Issues following take off**

[293] As part of an Agreed Facts Statement (dated 9 March 2012) made pursuant to the provisions of s 9 of the Evidence Act 2006, it was admitted that:

1. Shortly after take off the defendant elected to level the aircraft off at approximately 1000 ft AGL.
2. That as a result of that level off and the consequential speed increase of the aircraft towards the Flap 15 speed limit of 200 kts, the First Officer called "speed".
3. The defendant endeavoured to engage the auto pilot soon after take off but it would not engage.
4. An EDPWS Mode 3 alert "don't sink" occurred.
5. A single bank alert occurred as the aircraft was in the turn south of Peninsula Hill.

A further allegation made by the informant is that the aircraft had ended IMC at a position southwest of Deer Park Heights, the informant's submissions being based on witnesses who described weather moving from Kingston up into the Deer Park Heights area. The informant alleges that the defendant flew the aircraft into IMC when he was required by the particular departure process from the Queenstown airport to maintain visibility to surrounding terrain.

[294] The defence answer in relation to these issues is to identify each one. The defence identifies the arguments raised in relation to vertical separation. Mr Muir submits that CAR Part 91.301 does not apply in the circumstances of this take off. He relies to an extent on the expert evidence that was of the view that that CAR did

not apply in this case. In regards to CAR Part 91.301 it details the airspace VFR meteorological minimum at Table 4 which requires for Class D airspace (which Queenstown is) in a VFR flight that there needs to be 2 kilometres horizontally clear of cloud and 500 feet vertically within a controlled zone.

[295] The argument for the defence is that the flight that was being undertaken by the defendant was not a VFR flight but rather an IFR flight with a VFR segment. An investigation by the Transport Accident Investigation Commission in relation to this particular point as to the nature of the departure from Queenstown has found that it is an IFR flight with a VFR segment and that therefore as a result CAR Part 91.301 does not apply.

[296] Mr Muir for the defence in his closing submissions made the point that the aircraft was flying at some 1000 ft with a cloud base on the evidence of 1500 ft and thus the rule was being met in any event as it flew down the Arm. Mr Muir's position in relation to the cloud at Jardine's and around Deer Park Heights was that this cloud was not predictable and was inconsistent with conditions then pertaining. That is another argument altogether.

[297] However, on the evidence that is before me in relation to the allegation as to the breach of CAR Part 91.301, I would hold that the evidence I accept does not substantiate that there was such a breach, taking into account the express views of TAIC as to the nature of the take off being under IFR rather than VFR.

[298] In relation to the nature of the flight down the Arm and around Deer Park Heights, it is clear that southwest of Peninsula Hill the aircraft had to be levelled off to 700 ft AGL. It is clear on the agreed evidence that as a result the speed increased towards the Flap 15 200 kt speed limit requiring the First Officer to inform the defendant as to "speed". Then as a result of the loss of altitude a GPWS mode 3 alert of "don't sink" was activated. There is evidence that says that the loss of altitude was three times greater than the loss of altitude required to initiate such an alert. It is clear on the agreed evidence that at the same time that these events were unfolding, the defendant was attempting to engage the auto pilot which would not do

so. There then was a “bank” alert and the defendant had to attend to that issue as well.

[299] The defence argues that in relation to the speed limit, there is no proof before the Court of the speed limit actually being exceeded; that in relation to the reduction in altitude that was required by the cloud cover behind Deer Park Heights which was reasonably unforeseen; and that as a result of the lowering of altitude there was an increase in speed, and with the speed call then being made the thrust was reduced and there was nothing, upon Mr Muir’s submission, to indicate carelessness, no more than the crew in the cockpit “doing their job”. Mr Muir’s submission in relation to the bank angle advisory was that it was not unusual; that it was immediately corrected; and that Captain Julian, one of the defence experts, has had a number of such bank angle calls.

[300] In my view, it was appropriate for Mr Muir to make the submission that the “don’t sink” caution must be looked at in context. Albeit that Captain Glasgow considered it not to be an unusual event and that it would have been “in isolation” a “distraction” but “not a problem”, here there was, in the defence submission, a deliberately initiated manoeuvre and that it was not alarming or startling and that the aircraft was always in perfect control.

[301] I have regard to the overall position of the defendant at the time. He was piloting a large jet aircraft at a reasonably low altitude down Frankton Arm in poor light conditions, as I have already held. He had a requirement to maintain visibility with terrain, that is, not only to the ground but to the surrounding terrain. That visibility requirement was particularly accentuated because of the nature of the mountainous terrain, the time of the departure and the overall weather conditions pertaining. It is my view that the defendant encountered and had to manage the various difficulties that he met as a direct result of the decision he had made to commence the take off. He had to take steps to reduce altitude after realising that the cloud cover behind Deer Park Heights was lower than what he had anticipated (or assumed); as a result of that there was a build up of speed which he then had to correct. As a result of the loss of altitude there was a “don’t sink” warning. All these indicate an elevation of risk that was occasioned by the fact of the take off. I find the

fact that the time of evening, the poor light conditions, the cloud level all in combination result – when one considers the overall impact of these situations which on their own may only be “startling”, or “surprising”, or “distracting” - in an impact upon the overall risk of the take off and have a resulting impact upon the margins for safety required in such a jet aircraft operation.

[302] I accept what Mr Pilditch submits on behalf of the informant that I must look at the public interest in an objective way rather than from a pilot’s (even though that pilot is put forward as an expert) subjective opinions.

[303] The issue of entering IMC then arises. The informant argues that the reported cloud base and the cloud conditions generally would have indicated to the reasonable and prudent pilot prior to take off that there could be difficulties with cloud behind Deer Park Heights, an area that the pilot could not see prior to commencing the take off roll. That reasonable and prudent pilot at the threshold would have been aware that the take off required a VFR segment to Tollgate and as such he was, as the pilot, required to see the topography and the terrain for the entire visual sequence.

[304] The defence case according to the evidence given by both the defendant and the First Officer, is that at no time did the aircraft enter cloud. Mr Muir submits that the Christie video evidence does not disclose, as the aircraft went across Deer Park Heights towards Jardines, any evidence of cloud and that as the aircraft tracked down the Frankton Arm the video does not show cloud underneath the aircraft. Mr Muir criticised the position of witnesses called on behalf of the informant in this regard. He discussed the evidence given by Mr Marsden as to the weather conditions pertaining at the time.

[305] The witnesses called on behalf of the informant including:

- Mr Robert Clark who had lost sight of the aircraft because of his own manoeuvring in his driveway and did not see the aircraft enter, as he put it, “the whiteout”.

- Mr Malcolm Officer who was emphatic that he had seen this aircraft go up into cloud. He says that between Deer Park Heights and the Remarkables he could see the strobe light of the aircraft only and could not see the fuselage of the aircraft and that he had lost sight of the aircraft when it went up into cloud as it travelled past the golf course.
- Mr Allan Kirker who also said that as the aircraft passed the golf course his view of the aircraft disappeared in relation to its fuselage. In other words, he lost the physical sight of the aircraft into what he described as “a whiteout”. He says that he could just see the red and green flashing lights.
- Mr Andrew McKenzie who saw it turn into oncoming weather, sleet, rain and low cloud and poor visibility.
- Mr Maxwell Perkins who said that he did not see the aircraft but rather heard it above the clouds as it travelled in the Deer Park Heights/Remarkables/Tollgate area.
- Mrs Cain who did not see the aircraft after it left her sight when it was in the Frankton Arm.
- Mr Sakareassen who said that he saw the aircraft over Tollgate in that he had the aircraft “in his sights” at that time.

[306] There is a clear conflict in the evidence as to whether the aircraft entered IMC around the Jardines/Deer Park Heights area. It is difficult to reconcile the conflicting evidence that I have, that is, evidence from the defendant and First Officer Rush who both say that the aircraft never entered cloud at that point in time; whereas the other witnesses as detailed above say it did.

[307] I find that the civilian witnesses from their particular places of observation have seen the aircraft disappear. It might very well be that they saw the aircraft

disappear into haze/light cloud, however I cannot find that as a fact. Rather, I find that the defendant ran a high risk of having to enter cloud during the visual segment of his Queenstown departure because of the nature of the conditions pertaining at the time and that he took a risk of that occurring which on my view of all the evidence would not be a risk adopted by a reasonable, prudent pilot.

[308] Overall I am satisfied on the evidence that the nature of the various incidents that occurred following take off and the aircraft having to descend because of a lower cloud base around Deer Park Heights was such as to impact upon the public safety issues that have to be considered in my overall decision.

[309] I have completed a thorough evaluation of all the evidence I heard at the protracted hearings of the charge faced by the defendant; I have carefully considered all of the exhibits produced. I have taken into account the careful and detailed submissions of counsel. I take due note of the requirement to assess and judge the defendant's manner of operating PBN89 on 22 June 2010 from an objective viewpoint.

### **Findings**

[310] I make the following findings of fact on my assessment of the evidence having been satisfied by such evidence as I have accepted to the state where I am made sure of such findings of fact.

- (a) The defendant breached the Exposition by departing within the 30 minute restricted period (ECT). (Paragraph [157] hereof)
- (b) The ECT warning and requirement are mandatory requirements on a PIC such as the defendant. (Paragraphs [173] and [174] hereof)
- (c) The light available at the time of the departure was poor to the point that the take off should not have occurred. (Paragraph [174] hereof)
- (d) The "contingency" put forward by the defence was not in accordance with the Exposition requirements in respect of possible engine failure



prior to Tollgate. Using 'guesstimates' the defendant disregarded the trained for alternate as required by the Exposition, (ie, return to Queenstown if engine out prior to Tollgate). (See findings at paragraph [196] hereof.) I find that as at the time of departure such return to Queenstown could not have been completed safely given the light conditions; the existing weather conditions; and above all the time of day.

- (e) At the time of the departure of PBN89 the cloud base was below ZQN minima. (Paragraph [237] hereof)
- (f) At the time of the departure of PBN89 the cross wind was in excess of the PB Exposition limitation. In any event the defendant exposed his crew and his passengers to an undue level of risk by ignoring the focus from the ACT reports that cross winds were in excess of the 16 kt limitation. (Paragraph [273] hereof)
- (g) The defendant had a "closed mind" in respect of any increment to crossing height altitudes, whereas a reasonable and prudent PIC would have given consideration as to whether there should be such an increment. (Paragraph [292] hereof)

[311] Upon those findings of fact I then consider what occurred after the take off, (ie, the necessity to level the aircraft off at approximately 1000 ft AGL); the resulting speed increase; the "don't sink" alert following a further height level off at 700 ft AGL; a "bank" alert; an inability to engage the autopilot. The defendant as PIC had piloted the aircraft in such a manner that this series of events occurred. Each one is on its own of some concern taking into account the nature of the aircraft and the surrounding terrain, and the proximity of Lake Wakatipu, but when all are considered as one continuing event (which in my decision they must be) the safety margins at the time were, in my decision, seriously impacted upon. I repeat what I have said earlier in my resume on the law as it applies, risk avoidance is a priority in aircraft operations and the burden of risk avoidance falls clearly on the pilot.

[312] In the circumstances as I have found them to be at Queenstown on 22 June 2010, I am satisfied that no reasonable and prudent pilot faced with the ECT requirement; the poor light; the cloud cover below minima; the cross winds level (including gusts) would have commenced the take off roll. Therefore I find that the defendant on 22 June 2010 did not exercise the degree of care and attention a reasonable and prudent pilot would have exercised.

[313] I am satisfied that the defendant as PIC of PBN89 on 22 June 2010 was careless in his manner of operating the aircraft.

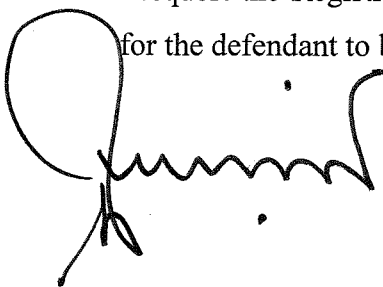
[314] The defendant ignored the mandatory requirements and, in their place, used his planned and self designed contingency. I have found against him on that issue. I consider the findings of fact that I have made establish clear fault on the part of the defendant. Indeed, on my findings, the defendant's fault is self evident in each and every such particular.

#### **Absence of fault**

[315] Having found that the informant has proved beyond reasonable doubt that the defendant was careless, it is for the defendant to prove absence of fault on the balance of probabilities.

#### **Result**

[316] Accordingly the defendant is not able to establish absence of fault on his part. I find that the charge under s 43A of the CAA against him proven in each respect. I request the Registrar of the Queenstown District Court to arrange a date and time for the defendant to be sentenced.

A handwritten signature in black ink, appearing to read 'K J Phillips', with a large, stylized initial 'K' on the left and a wavy line for the rest of the name.

K J Phillips  
District Court Judge