Senate Inquiry Supplementary Submission on the ATSB Findings of the Ditching of the Westwind II VH-NGA off Norfolk Island on 18 November 2009

This submission is made under Parliamentary Privilege 8 February 2013

by Bryan Aherne in a private capacity

Contents

1. Introduction

I thank the committee for allowing me to make this supplementary submission to the Inquiry.

As in my first submission, I believe the field work of the CASA inspectors on the Special Audit was evidence based, objective and reflected what appears to be a very thorough assessment of the systemic problems within the operator.

The same cannot be said for the ATSB report. The ATSB have ignored evidence, such as fatigue, operator deficiencies, regulatory oversight and using hindsight and outcome bias, have failed to show the deficiencies within our aviation system, which remain unchecked.

The Operations Manual which CASA accepted as a method for the company to be compliant with the civil aviation regulations (CAR), had no instructions for calculating the contingency fuel required in abnormal operations, no amounts for taxi fuel, no amounts for approach fuel, and used fuel figures not in accordance with the manufacturers data.

So concerned were the CASA executive during the Special Audit, an emergency meeting with the accountable managers of the company and its parent was held on the 7th December 2009 to inform them that the Westwind Fuel Policy was grossly deficient in its guidance and compliance.

Despite knowing this, two weeks later on the 24th December 2009, CASA asserted to Captain James in a suspension letter that he had failed to comply with the company operations manual's fuel policy.

In section 5 (b) of the suspension letter, CASA asserted that he did not comply with abnormal operations contingency fuel requirements, but failed to tell him in the course of fair procedure, that CASA found that the operator had provided no instructions or method by which to perform these calculations contrary to the requirements detailed in CAR 220.

In the same letter they also asserted that he received an aerodrome forecast at 0904 UTC and failed to divert. This assertion was factually incorrect since he did not receive a forecast at 0904, he received a report and neither the regulations nor the AIP require any pilot to provide for an alternate based on weather reports. Both the regulations and the AIP stipulate that such decision making be based only on an aerodrome forecast.

CASA assert Captain James demonstrated poor airmanship by not making the 'right' decision following receipt of the weather report. CASA however do not acknowledge they "accepted" the operations manual as a methodology to comply with the regulations. Captain James followed the operator's methodology, which allowed the flight to continue to Norfolk Island as it had two separate runways and the weather reports received did not show any cloud below the landing minima before the LPSD.

Captain James was not the person responsible for writing the Operations Manual and a flawed Fuel Policy. CASA (in 2008) had accepted this methodology to comply with the regulations. Regardless of whether CASA insist they do not "approve" manuals, they accepted the manual.

The outcome, which pinned six people's survival hopes on a water proof torch, to a large extent was due to the fact that CASA had allowed the operator to use those procedures.

Furthermore there were no instructions for planning Critical Points or Points of No Return for off track diversions. There is no evidence that CP and PNR checks of line pilots were performed by supervisory or check pilots in accordance with the Operations Manual.

Lastly the operator had a generic fuel Specific Gravity (SG) for all flights, but as Mr Richard Davies has submitted, the differences in a generic SG being used as opposed to an actual SG can be as much as half an hours' fuel burn in a Westwind II.

2. Responsibility, Attribution and Cause

It appears CASA and the ATSB place the responsibility of an entire complex organisational accident sequence on a pilot and possibly a single misheard syllable.

Again, the issue as contained in my first submission is this. The crew were not required by law to divert even if they had received the correct SPECI. Alternate provision is only required on forecasts, as promulgated in both the AIP and regulations.

CASA should stipulate in the AIP and the regulations the most appropriate course of action to be taken by a pilot on receipt of either actual and or forecast weather below alternate minima, and not expect pilots to become in flight forecasters. CASA ignores its lack of specific guidance, preferring to malign Mr James's 'airmanship' in an effort to explain the development of the accident.

The ATSB and CASA are not shifting their positions and although they are well aware that HF radio is not perfectly readable, appear content to dismiss the possibility that a transmission although acknowledged may have been misheard and can allow an aircraft to fly onwards into previously un-forecast weather. A requirement for crew to read-back safety critical weather information when using HF radio would prevent this from happening. A three year investigation should have revealed this.

The HF radio on the aircraft did not have selective calling (SELCAL), which means the crew had to listen to "white noise" over the entire flight and listen out for transmissions pertinent to them, which is mentally fatiguing and distracting.

Read-backs (where a pilot reads-back an altitude, heading or instruction to confirm receipt) were bought into ATC transmission reports for pilots because miscommunication was identified as a safety issue in many accident and incident reports. These weather reports transmitted to the crew did not require read-back.

The ATSB should issue a recommendation that transmissions of a critical nature (such as SPECI, SIGMET) made by HF and VHF radio should require read backs by pilots.

The Chief Commissioner stated the following at the 21 Nov hearing:

Chief Commissioner: *The automated weather service provides regular updates and also provides updates if there is a significant variation in the reported conditions via a METAR or a SPECI. That information is automatically transmitted to the ATS providers and they are required to provide it to the crew, which is the SPECIs that we talk about and other things in our report*

(my underline)

This is precisely why this Inquiry is now having to ask the ATSB why their report did not acknowledge that non routine weather (SPECI) is required to be passed on to pilots and their failure to make safety recommendations to both Fiji and New Zealand ATS. In Australia's Visual Flight Guide aviation publication on page 209, Hazard Alerts (including when IFR and VFR minima deteriorate) are required to be transmitted to aircraft: (downloaded February 2013)

Hazard Alerts include:

- SIGMET;
- AIRMET; and
- observations, pilot reports, or amended forecasts indicating that weather conditions at the destination have unexpectedly deteriorated below the IFR or VFR alternate minima, and any additional information that could possibly assist the pilot in the avoidance of hazardous situations.

Hazard Alert Information, or its availability, will be directed or broadcast on the appropriate ATS frequencies;

e.g. 'ALL STATIONS HAZARD ALERT MELBOURNE. WEATHER OBSERVATION NOTIFIES UNEXPECTED DETERIORATION BELOW THE IFR ALTERNATE MINIMA'.

The ATSB seem to cursorily dismiss any criticism of the ATS provider which failed to proactively inform flight crew of hazardous weather conditions by referring to an "international agreement" which purportedly did not require Nadi to inform the flight crew of hazardous weather:

"Nadi ATC did not, and was not required by any international agreement to, proactively provide the 0803 amended Norfolk Island TAF to the flight crew". page 7 ATSB report.

The ATSB failed to recognise that the existence of such an "international agreement" was a safety issue and made no safety recommendation to put in place a preventative control. The ATSB are content to allow this "international agreement" to stand.

The ATSB are a safety bureau, not a compliance regulator. If a regulation or agreement affects safety, the ATSB are required to raise this issue, not excuse it.

Apart from being a critical safety issue on its own, this contradicts the International Civil Aviation Organisation (ICAO) Annex 11 Air Traffic Services Standards:

4.1 Application

4.1.1 Flight information service shall be provided to all
aircraft which are likely to be affected by the information and
which are:
a) ***provided with air traffic control service****; or*
b) ***otherwise known to the relevant air traffic services units****.*
No Difference[1] lodged by New Zealand with ICAO against standard 4.1.1 NZ Rule *CAR 172.93(a).*

4.2 Scope of flight information service

4.2.1 Flight information service shall include the provision
of pertinent:
a) SIGMET and AIRMET information;
b) information concerning pre-eruption volcanic activity,
volcanic eruptions and volcanic ash clouds;
c) information concerning the release into the atmosphere
of radioactive materials or toxic chemicals;
d) information on changes in the serviceability of navigation
aids;
e) information on changes in condition of aerodromes and
associated facilities, including information on the state
of the aerodrome movement areas when they are affected
by snow, ice or significant depth of water;

[1] Differences against ICAO standards are required to be lodged with ICAO and promulgated into the States AIP

f) information on unmanned free balloons;
and of any other ***information likely to affect safety****.*

No Difference lodged by New Zealand with ICAO against standard 4.2.1. NZ Rule CAR 172.93(b).

4.2.2 Flight information service provided to flights <u>shall</u>
include, in addition to that outlined in 4.2.1, the provision of
information concerning:
a) ***weather conditions reported or forecast at departure,***
destination and alternate aerodromes;

No Difference lodged by New Zealand with ICAO against standard 4.2.2 a) NZ Rule CAR 172.93(b)(2); b) MATS RAC 10, 1.7
Traffic Information.

(My Bold and underline)

(*No Difference lodged by Australia with ICAO against standard Annex 11, 4.2)

Note that the word "shall" is a standard, not a recommended practice.

I am informed verbally, (but cannot officially confirm) the Fiji AIP was written by New Zealand CAA and it appears almost identical in the RVSM procedure process. (Refer to the annex in my first submission)

The ATSB have overlooked this major breakdown of safety critical information being required to be passed to aircraft in the Fiji & New Zealand Oceanic Flight Information Service.

At the November 2012 testimony:

Chief Commissioner*: I would only say two things. There is a lot of detail here. My understanding is in the Westwind it would not be a reasonable description of the aerials to say they are relatively puny. They are in fact quite reliable HF aerials. Certainly the transmission both to and from the aircraft that was recorded by Auckland does not appear to show any distortion. <u>I recognise it may have been different in the cockpit.</u>*

(my underline)

If the Chief Commissioner recognises the transmissions may have been heard differently in the cockpit, then why was this not included in the report? The ATSB report states the transmission was received by the crew but not assimilated. This admission by the Chief Commissioner appears to be one valid reason why the transmission and information may not have been assimilated. As stated earlier, this alone substantially changes the ATSB analysis by their omission of safety critical information from the final report.

The Chief Commissioner stated at the October 2012 hearing of the Inquiry:

Chief Commissioner: *It is an attempt to establish a matter of fact, Senator. The focus of the investigation, from a comparatively early stage, was on what led up to the accident<u>. If there is a fair criticism here it is that we did not quite get the balance right.</u> We were focused more on why it came to that event rather than what happened afterwards. That is what I am hearing and I think there is substance to it. <u>With the wisdom of hindsight,</u> it might not have been quite the right balance in terms of how we reviewed processes.*

Given the amount of luck which the survivors had (a waterproof torch), this could easily have been a six (6) person fatality. The role of the incorrect position of the life raft (being positioned untethered in the aisle before ditching), failed safety equipment (lights and inflation chambers,& whistles)and radio transmissions of critical weather information are definitely issues of " substance".

The ATSB report demonstrates clearly, that Australia has a "headstone" mentality to aviation safety. Why is it we cannot identify these safety issues through this accident? Why is it only through a fatality we would draw out this information through the coronial process?

The comment " with the wisdom of hindsight" from the Chief Commissioner is most concerning. The ATSB have hindsight, three years of hindsight to do a comprehensive analysis and investigation.

I am critical of the ATSB for this very reason. I acknowledged in my testimony that CASA is in a no win situation in some regards, they cannot foresee every circumstance.

However, the ATSB have as much hindsight as they need. That is the entire purpose of the ATSB, to be impartial, independent and learn from investigations. Hindsight necessarily identifies the issues, recommendations are made, and hopefully our aviation system is improved. The Norfolk Island accident report is not an investigation, it is a narrative.

There is a lot of how and what happened, but little on why.

3. RVSM

The Westwind II on this sector required to be flight planned below RVSM airspace. The Fiji and New Zealand AIP prohibits non-RVSM aircraft to use "exceptions" as listed in the AIP as a method for non-RVSM aircraft to "get around" this requirement. If you cannot legally plan the flight, you cannot do the flight.

The **Chief Commissioners** evidence in the Inquiry of the ATSB interpretation of the New Zealand AIP regarding the RVSM issue was: *" It says that appropriately equipped aircraft can use RVSM airspace at any time, that other aircraft can use RVSM airspace with four hours notice but may have to be directed from that airspace if it conflicts with other traffic, and that air ambulance work—which was how the New Zealand rules saw this operation and it was defined in their air traffic control system—is immediately allowed into that airspace and allowed to operate in it." pp 17 Hansard.*

The Chief Commissioner fails to mention that the NZ AIP continues with a summary of the Non-RVSM approved aircraft attempting to regularly use RVSM airspace with:

1.3.7 This process is intended exclusively for the purposes indicated above and not as a means to circumvent the normal RVSM approval process. The telephone numbers for non-RVSM ATC approval request are:
(a) Christchurch ATS Centre: (03) 358 1694;
(b) Auckland Oceanic Control Centre: (09) 275 9817.

Given that the operator had been recorded as being non-RVSM compliant as far back as 2003 by PARMO (Pacific Approvals Registry and Monitoring Organisation) (see my first submission) it appears they had been circumventing this requirement for over six years. Exempt air ambulance flights would not appear as breaches in PARMO's documents, and New Zealand ATS contradict the Chief Commissioners evidence as VH- NGA was directed out of RVSM airspace because of impending conflicting traffic. If VH-NGA was exempt, why was the aircraft directed out of RVSM airspace? Air ambulance flights are not exempt from this requirement.

Humanitarian flights and Mercy flights are exempted with a minimum of four hours notice. A commercial air ambulance flight is neither a humanitarian nor a mercy flight. A humanitarian flight is to a flood, famine, natural disaster or similar not regular commercial aerial work. A mercy flight is when no other method of saving life exists other than by the aircraft crew breaching a regulation or rule and the pilot advising ATS immediately.

Neither a four hour notification was lodged as required out of Sydney or out of Samoa, nor was a mercy flight declared as it was not a humanitarian or mercy flight. As such, no exemption from RVSM applied and the aircraft was not "immediately allowed into that airspace"

ICAO, through PARMO, identified numerous times the non compliance of the operator, and specifically, VH-NGA. If air ambulance was exempted on each flight, why was VH-NGA (the air ambulance aircraft) repeatedly cited for non-compliance of RVSM? (see my first submission re the tail number of VH-NGA repeatedly being reported for non-RVSM compliance).

In addition, Captain James stated in an email to the operator almost one year earlier in December 2008:

> *"Had big issue with NZ ATC over not being RVSM again but needing to fly in RVSM airspace – I feel like we're on borrowed time with this one – soon they will just say no and put us down to 28 thousand – will be a big deal then."*

The New Zealand AIP dated February 2007 and the email above contradict of the Chief Commissioners testimony.

The pilots observations to management in the December 2008 email of the operators history of operating "on borrowed time" about "not being RVSM again" over many years, demonstrates systemic organisational and regulatory oversight failure.

4. Fuel & Weather Guidance

Director of Aviation Safety: *Turning to the matter of whether you divert when the weather is below alternate minima when you are in flight, that is an issue which does divide the pilot population. It does not divide the population just in CASA; it divides the population in airline operations as well. It has been a longstanding question of what constitutes when you divert. Of course the things you have to take into account via airmanship is the trend of the weather. If you had been following the weather, as Mr James had been given the weather numerous times, you develop a picture of where the weather is deteriorating or whether it is not; and whether you are going to an airfield that has only one runway or more than one runway. There are numerous things to take into account. My own experience everywhere around the world is: this is not a question that is hard and fast; it goes to the pilot in command to make that decision*.

The Director of Aviation Safety claims "division amongst the pilot population" which appears to provide a reason to ignore a problem if it is not easily solved. CASA's response to the ATSB report does NOT address the issue through the regulations or the AIP, instead they have proposed more advisory publications which can further complicate an already unnecessarily complex issue. (see the CASA response in the ATSB report)

Director of Aviation Safety: *We considered the number of items that would have to considered by the pilot in command. We also considered a previous example in which a flight did divert on this basis. The aeroplane had an issue with what is called the leading edge slat part of the flight controls. If they had continued on that diversion, they would not have had enough fuel to reach where they were trying to divert to. There are many issues that have to be taken into account here. But as I said,* *Australia is not unique in this. <u>I know of no regulatory environment in the world—and there may be one, but I do not know of it—where there is a prescribed set of circumstances such that when the weather gets below the alternate planning minima you should divert the aeroplane. And I am talking about 747 400s down to any size aeroplane world wide.</u>*

The comment by the Director Of Aviation Safety regarding diverting and having an emergency is at odds with the Australian regulations:

CAR 257 (5) *Sub regulation (4) does not apply if an emergency arises that, in the interests of safety, makes it necessary for an aircraft to land at an aerodrome where the meteorological minima is less than that determined for that aircraft operation at that aerodrome.*

The comment is also at odds with contemporary literature on risk and compliance as illustrated by the following statement by Professor Andrew Hopkins (2011):

"An organisation that has a regime of rule management in place relies on workers to call attention to situations where they believe that rule-compliance is inappropriate, so that the rules can be examined and changed if necessary. In particular it relies on workers to call attention to situations where they believe rule-compliance would lead to unsafe outcomes. This requires workers to remain risk aware and not simply to follow rules blindly. In short, provided there is a possibility of rule modification built into the management system, there is no incompatibility between rule-compliance and risk awareness.

There are sometimes exceptional situations where it is obvious that rule-compliance will lead to unsafe outcomes but there is no time to invoke the procedure modification process. In these situations we want our risk aware operators to exercise their discretion and violate the procedure. But this is very different from the routine violations that are designed to get the job done more easily or more efficiently. Moreover, this is not to suggest that rule compliance should be discretionary. On the contrary, people need to be held to account for their violations. However, in these exceptional situations their accounts will be thoroughly convincing, and their violations will be seen to be entirely justified."

In the same literature, Professor Hopkins refers to an organisational accident at the BP Texas Oil Refinery in 2005:

The problem was that there was no regulation or otherwise enforceable rule that specifically required the vent be replaced, and it was therefore a matter of assessing the risks. Texas City argued that the risks were adequately controlled and ultimately OSHA was not able to over-ride this judgment. Interestingly, Texas City management recognized that they would eventually be required by the Environmental Protection Agency to replace the vent with a flare, for environmental reasons, but their position was that they would not make the change until required to by law.

There is an implication that can be drawn from this story. <u>Where it is clear what good practice is, as it was in this case, it needs to be enshrined as a rule</u>, for example in company standards *or industry standards or perhaps in government regulations, in such a way that it can be enforced by government inspectors, if necessary. The problem at Texas City was that there was room for argument, which site management was able to exploit in such a way as to avoid the expenditure required to bring the site up to standard.* [2]

(my underline)

Professor Hopkins is clear that where an industry best practice exists, or in this case, other examples where regulations are available, it should be enshrined as a rule

To assert that a prescriptive AIP requirement would mean a crew in an emergency situation would follow the AIP contrary to the passengers, their own and the aircrafts' safety is neither supported by contemporary safety literature or regulation. To use the possibility of unrelated multiple failures occurring as a reason to not write a rule is axiomatic to saying the consequences of a catastrophe will occur if the rule is written. Using this logic how can any regulator justify writing any regulation?

The probabilities of unrelated multiple failures occurring can never be estimated. However this does not prevent progress. As an example, many regulators the world over, including CASA, accept twin engine turbine passenger aircraft for extended overwater operations (was known as ETOPS)[3] providing the quality systems, maintenance, reliability, and operators procedures make the probabilities of failure extremely low.

The Director of Aviation Safety made the comment that he knows of no other country that has a prescribed set of circumstances for diverting due to weather. With regard to in flight fuel decision making regarding weather minima, there is other regulatory guidance available. Hong Kong sets out an AOC requirement for an operator's Operations Manual, to require fuel management en route:

"Civil Aviation Department Hong Kong June 1997

Air Operators Certificates

Operation of Aircraft Part One

Chapter 4 Operations Manual (Last amended April 1997)

8 FUEL PLANNING AND MANAGEMENT - AEROPLANES

8.10 Predicted Reduced Fuel State - Destination

8.10.4 If en route it becomes obvious that a flight will not arrive at the destination with the required Company Minim um Reserve(CMR), the flight may continue to the planned destination, provided that the fuel remaining on landing will be not less than an amount equal to that which would
enable the aircraft to hold for 30 minutes at 1500 ft at the anticipated landing weight –
i.e. Minimum Fuel – and ALL of the following conditions are satisfied:
(a) There must be at least two geographically separate runways available for use
which meet the performance criteria for the aircraft; and

[2] Risk-management and rule-compliance: Decision-making in hazardous industries
Andrew Hopkins (2011), Safety Science

[3] Now referred to as EDTO operations

(b) There must be no ATC delays forecast for the flight's ETA at the destination; and
(c) The actual weather and that forecast for the flight's ETA at the destination must be at, or better than, the alternate planning minima for the non-precision approach aid with the higher minima serving the two runways being considered in (a) above and, in addition, the surface wind is within the normal crosswind limits for the aircraft type.

*Where these conditions are not satisfied, the flight must **divert** to an en route airport for refuelling".*

(Hong Kong CAD's **Bold**)

There is regulatory guidance in ICAO (attached as Appendix B) and other regulators requirements for aeroplanes such as the UAE, for en route decision making about weather/fuel. There are other jurisdictions which have written prescriptive regulations on the issue of in flight decision making when destination weather reduces below the stipulated minima.

To determine culpability James Reason put forward the "substitution test". Using another crew similar in age and experience to the crew of VH-NGA would the same event (at LPSD) be possible? CASA's flying operations inspectorate were equally divided on in flight decision making in the current AIP, regulations and guidance, this information was not included in the ATSB report. This demonstrates the problem is far more widespread than Captains James' "poor airmanship". CASA accepted the operations manual as a methodology to comply with the regulations, and as Captain James followed it, the current outcome materialised, but CASA & ATSB find it is now an "airmanship" issue .

5. Failure of Defence Barriers and Absent Risk Controls

***Director of Aviation Safety**: ....."I agree that there are company issues here—I have said that all along. Yes, they could have done better; yes, they could have supported the pilot in command. But the last line of defence here is not the company; the last line of defence is the person who signs for the aeroplane and says: 'Yes, it has enough fuel. Let's go.' You know that as well as I do, Senator, without being rude or in any way derogatory. There is no other defence in the end than the pilot in command. That is who it comes down to"*

The Director of Aviation Safety makes a valid point that in the Norfolk Island accident, numerous lines of defence failed and that the flight crew became the last line of defence

For the Director of Aviation Safety to state in this case that the last line of defence failed (following which CASA suspended Mr James' airline transport pilots licence) is acknowledgement that there were numerous breaches of our aviation safety system's defences prior to that point.

That those defences were easily breached shows that our aviation safety system lacks resilience. A good case in point is the Bureau of Meteorology. Why did they take so long to forecast that the weather could deteriorate below the landing minima at Norfolk Island? Why were the flight crew expected to have a higher degree of meteorological knowledge than the Bureau of Meteorology and predict weather which the BOM could not? Our safety systems are brittle when:

- We have an operator with history of risk migration, operating outside of acceptable risk by breaching over thirty four acts of parliament and regulations,

- We have an operator with a history of prior breaches including a Safely Alert in the previous year because of fatigue issues,
- We have an operator with a flawed fuel policy, and
- We have an operator which ignored a warning by the accident pilot about RVSM issues only a year before that *"we are on borrowed time"*

These weaknesses in our Safety System will not vanish until CASA and the ATSB acknowledge the weaknesses of the regulator, air traffic service providers, and the operator.

I acknowledged in my previous appearance before the Inquiry that the crew committed active failures, that is not denied. However, a multitude of other passive controls in the aviation system, which should have been effective, were not. It is difficult to arrive at the same conclusions as the ATSB or CASA when information selectively withheld is exposed.

Passive controls are defined in the research (2010)[4] as controls which a controller (in this case a pilot) does not activate to be effective. The Director of Aviation Safety and The Chief Commissioner fail to acknowledge that many other passive controls, or defence barriers failed. Despite the depth of research in organisational safety and complex socio-technical systems, as aviation is, the entire focus of both CASA and ATSB has been almost solely on the pilot.

The first line of defence: in this regard, the regulatory framework in which the operator was working.

CASA had approved the operator to operate in the Aerial Work category for its for air ambulance missions. This stipulates a safety requirement equivalent to crop spraying. Aerial work operations were not required to provide an alternate when operating to "Remote Islands' . As for when flight crew were to provide for an alternate when weather deteriorated below the alternate minima en-route, we now know that CASA's own Inspectorate have raised opposing views which implies that the regulatory guidance was non-definitive. As such, the AIP was non-definitive on issues of in-flight fuel management. Ultimately CASA accepted the company operations manual as a method by which to comply with the regulations and that operations manual allowed the crew to proceed to Norfolk Island (see my prior submissions and Mr Richard Davies submissions) despite the existing weather conditions.

The second line of defence: was the aircraft was not capable of holding an alternate for Norfolk Island from Samoa direct. The aircraft was not suitable to perform long distance oceanic flights of a dynamic reactive nature such as EMS flying, while providing for alternates and furthermore, was not equipped to operate in RVSM airspace. Equipping the aircraft appropriately is clearly the operator's responsibility.

The operator –not Mr James- entered into a commercial contract with the medical provider to include Samoa in the catchment area for the operators Westwind aircraft. There is evidence that this same route was operated before by other company senior pilots.. Those senior pilots were also placed in the same position of not being able to provide for an alternate in the unfortunate event their weather forecasts did not predict dynamic weather changes such as would prevent the aircraft from landing at Norfolk Island, (as evidenced in the previous research of the ATSB.) The Westwind II aircraft cannot carry sufficient fuel to allow it to divert anywhere from Norfolk Island after a flight

[4] Accident analysis and hazard analysis for human and organizational factors doctoral thesis Margaret Stringfellow MIT October 2010

from Apia (Samoa). Why this is Mr James fault remains unanswered. This is clearly the operator's responsibility, via the Chief Pilot and AOC.

How the ATSB in its final report can claim the operator's procedures complied with the regulations is a fabrication designed to support its outcome and hindsight bias.

See extract the following extract from the CASA Special Audit:

In discussions with the Westwind pilots it was stated that the captain is responsible for all planning which is often done prior to leaving the accommodation. There is no documented requirement for a cross check of the plan although all First Officers reported cross checking the plan in flight. It was also reported that Point of No Return (PNR) calculations are often not calculated and if calculated not cross checked.

CASA Inspectors interviewed the operators Westwind pilots, and found that PNR calculations were often not calculated and if calculated not cross checked.

CAR 220 places the onus on the operator to include specific instructions in regards to fuel for routine operations and contingencies, particularly engine failure:

CAR 220 Fuel instructions and records

(1) An operator shall include in the operator's operations manual specific instructions for the computation of the quantities of fuel to be carried on each route, having regard to all the circumstances of the operations, including the possibility of failure of an engine en route.

Penalty: 50 penalty units.

RCA 321064 has been issued for failure to comply with CAR 220 (1) and CAR 215 (2).

A review of the fuel policy for the Westwind and Lear operations was conducted to assess for compliance with CAR 220, *'An operator shall include in the operator's operations manual specific instructions for the computation of the quantities of fuel to be carried on each route, having regard to all the circumstances of the operations, including the possibility of failure of an engine en route'.*

For the Westwind aircraft, the Operations Manual has two methods of calculating fuel, 23lbs/min + 400lbs climb..... or 1700 1st hour, 1400 2nd hour, 1300 3rd hour. There is no guidance for which method should be used and when. There is no guidance for planning for flights requiring a 'sea level' cabin or flights where access to Reduced Vertical Separation Minima (RVSM) Airspace is denied by air traffic control (ATC), flights experiencing a depressurisation or flight involving an engine failure. As the company regularly conducts flights to isolated and remote islands, policy requiring the carrying of alternate fuel is needed.

On reviewing this audit comment, the ATSB needs to explain why its criticism of the operator evident in earlier report drafts were removed from the final report (see below). It cannot simply be explained as a "typographical error".

"The operator's procedures complied with the relevant regulatory guidance" pp 37 ATSB report.

Further to the question of a Chief Pilots responsibilities the Director of Aviation Safety commented from the October hearing in responding to questions:

Senator NASH: *That is not my question. My question is: are you saying that the chief pilot does not have the responsibility to know the capability of the aircraft to that extent? Are you saying that he does not have that responsibility?*

Director of Aviation Safety: *The pilot in command has that responsibility. The chief pilot is not responsible for deciding whether it has enough range to fly.*

Senator NASH: *So he does not need to know the capability of the aircraft?*

Director of Aviation Safety: *He does, but the capability of the aircraft is not set in stone. The capability and range of the aircraft depend on wind, weight and fuel on board. They are all decisions for the pilot in command. Sure, the chief pilot should not set an impossible task, but in this particular case, Pel-Air have flown that sector many times before—*

As demonstrated in my previous submission, this sector was flown by a senior management pilot in the company before, but note that the fuel they landed with at Norfolk Island **would NOT** have allowed them to conduct a missed approach and divert to Noumea or hold an alternate past the Last Point of Safe Diversion (LPSD).

The responsibilities of the Chief Pilot are contained in CAO 82.0. Specific to this Inquiry I have bolded and underlined the pertinent provisions:

2 Responsibilities of Chief Pilot

2.1 The Chief Pilot for an operator is to have control of all flight crew training and operational matters affecting the safety of the flying operations of the operator.
2.2 The responsibilities of a Chief Pilot must, unless CASA otherwise specifies in writing, include the following responsibilities:
(a) ensuring that the operator's air operations are conducted in compliance with the Act, the Civil Aviation Regulations 1988, the Civil Aviation Regulations 1998 and the Civil Aviation Orders;
(b) arranging flight crew rosters;
(c) maintaining a record of licences, ratings, and route qualifications held by each flight crew member, including:
(i) validity; and
(ii) recency; and
(iii) type endorsements and any applicable licence restrictions;
(d) maintaining a system to record flight crew duty and flight times to ensure compliance with duty and flight time limitations, in accordance with Part 48 of the Orders;
(e) ensuring compliance with loading procedures specified for each aircraft type used by the operator and proper compilation of loading documents, including passenger and cargo manifests;
<u>(f) monitoring operational standards, maintaining training records and supervising the training and checking of flight crew of the operator</u>*;*
(g) conducting proficiency tests in the execution of emergency procedures and issuing certificates of proficiency as required by section 20.11;
(h) training flight crew in the acceptance and handling of dangerous goods as

required by the Civil Aviation Regulations 1988 or the Orders;
(i) maintaining a complete and up-to-date reference library of operational documents as required by CASA for the class of operations conducted;
(j) allocating appropriate aircraft.

*The company's **Operations Manual** repeated the requirement in CAO 82.0 for the chief pilot to allocate an aircraft appropriate to task in:*

Part A

1.2.3

h) Allocation of aircraft appropriate to the planned task.

The accident aircraft was not equipped appropriately to operate in RVSM airspace and had numerous violations going back on record since 2003.The Chief Pilot was responsible for the approval for the aircraft to operate on that route (Apia to Norfolk Island) directly knowing the aircraft was not capable of holding an alternate for Norfolk Island past the LPSD and knowing the aircraft was not equipped to operate in RVSM airspace.

I reiterate the Director of Aviation Safety comments*: "Sure, the chief pilot should not set an impossible task"*

It is impossible to hold an alternate direct Samoa to Norfolk Island past LPSD. This obviously places a heavy reliance on forecasting, and as such, weather forecasting is a critical safety control.

Note in my first submission the fuel order sent by the operator to the fuel agents in Samoa prior to the arrival of VH- NGA. It states the next port ex Samoa was Norfolk Island. This confirms that the operator expected the flight to be operated directly. This expectation was held also by the aeromedical provider and no doubt the operator's business model was based on direct flights.

Clearly the task the company set for its pilots was to fly directly between Apia and Norfolk Island and clearly the aircraft was not appropriate.

The third line of defence: was an absence of operational guidance in the Operations Manual for this type of operation notwithstanding that the aircraft was inappropriate to the task. The operations manual contained no instructions for pilots to calculate critical points (CP) and points of no return (PNR) despite there being regulatory requirements to do so. Despite this deficiency CASA accepted the Operations Manual as a method to comply with the regulations.

The fourth line of defence: was an absence of effective supervision by the operator of its line operations and in particular the different flight planning methods that were being used by its pilots.

The Chief Pilot was responsible for training Mr James and monitoring and checking his standards in compliance with the company operations manual. This was not done and this was not Mr James fault no matter how convenient it would be for both ATSB and CASA to shift responsibility in all aspects of the operation away from the Chief Pilot and the operator.

The fifth line of defence: was both Fiji and New Zealand ATS providers not passing on updated forecasts showing a significant change to the aerodrome forecast for Norfolk Island as they are required to do in accordance with their respective AIP and International Standards.

The sixth line of defence: was a delay by the BoM in issuing an amended TAF predicting that the weather would reduce to below the landing minima at around the time of arrival of the aircraft at Norfolk island. This poor forecasting dates back to 2000 (where the ATSB made a recommendation) and prompted further ATSB research in 2004. Neither CASA nor the ATSB should reasonably expect any pilot with an ATPL, to be held to a higher forecasting standard than the Bureau of Meteorology trained (science degree educated) forecasters, with unfettered access to the fullest range of meteorological data including real time satellite images, auto weather stations and the ability to easily communicate with any number of meteorological forecasters or observers.

The seventh line of defence: critical weather updates given to Auckland by the Norfolk Island Unicom were not passed on to the flight crew.

The eighth line of defence: was the Unicom were not approved Weather Observers (see Appendix D which details the Department of Transport decision to create Unicom's' in 2000')

Even if the non approved weather observer Unicom could phone or call an aircraft on HF radio, our regulations make it an offence for the pilot to use that information:

CAR 120 Weather reports not to be used if not made with authority

(1) The operator or pilot in command of an aircraft must not use weather reports of actual or forecasted meteorological conditions in the planning, conduct and control of a flight if the meteorological observations, forecasts or reports were not made with the authority of:

(a) the Director of Meteorology; or

(b) a person approved for the purpose by CASA.

Penalty: 5 penalty units.

(2) An offence against sub regulation (1) is an offence of strict liability.

Note For ***strict liability****, see section 6.1 of the Criminal Code.*

The ninth line of defence: was the Unicom was not licensed to use the HF radio frequency to contact the pilot direct and advise of the deteriorating weather conditions. This contact would have been as effective as a Satellite phone, but bureaucratic red tape prevents this.

Nine major lines of defence (which are the most significantly obvious) failed on this flight, and both the ATSB and CASA's Director of Aviation Safety are suggesting that a fatigued pilot (who had about four hours broken sleep in 24 hours) should have made decision to divert, which the AIP and regulations did not require him to do. Even if the decision to divert was one of airmanship it is clear from the division of opinion on this matter within CASA's own inspectorate that the outcome may not have been different.

For a last line of defence to be fully effective (flight crew) they need to be alert and not suffering from significant or excessive fatigue. They need to be trained, current, proficient and be able to work from sound procedures as well as be provided with appropriate resources to do the job to a consistently high (safe) standard. In this accident the crew do not meet the test of effectiveness in three of the most obvious areas:

1. Fatigue was an obvious issue, however this is not mentioned by CASA or ATSB as a contributing factor and is dismissed.

I have personal experience operating air ambulance IFR single pilot on a continuous 48 hour standby roster on base. It is difficult on the body. You cannot predict how much sleep you can get nor can you predict how much flying you are going to do. Operating in a dynamic air ambulance role, particularly at night in poor weather is both physically and mentally demanding and as such, fatigue is insidious and unnoticeable during periods of peak adrenalin. However it can then build rapidly during periods of low stimulus such as cruise flight.

For a company to roster pilots for 7 days 24 hour standby (as was done in this case) is no way to ensure that the crew receive appropriate rest and is especially unsafe given the dynamic and reactive nature of air ambulance flying. The operator's absence of fatigue risk management should have been noted by the ATSB as a safety factor.

2. Training for CP and PNR calculations required under the Operators Manual after promotion to command, was not done, nor was there ongoing line supervision or checking of the fuel calculations method by line crew. It is astonishing that the ATSB has accepted that a lack of supervision existed to the extent that co-pilots adopted their own techniques to suit different Captains. This demonstrates a lack of standardisation and supervision <u>but the ATSB fails</u> to acknowledge it as a contributing factor: page 37 ATSB report

" No detailed and consistent methodology for carrying out flight planning was available, which would explain flight crews applying their own individual methodologies and reports of co-pilots varying their techniques to suit respective pilots in command (PIC)."

3. Critical procedures were deficient or absent in the Operations Manual. There were no procedures to calculate the single engine depressurised contingency. There were no procedures to calculate "off track" Critical Points, and Points of No Return. Despite this the ATSB states on page 38 of their report:

> *"Although the PIC complied with a Westwind-specific fuel planning method in Part B of the operations manual, his flight planning method did not ensure compliance with all of the fuel policy requirements in Part A of that manual. Part A required pilots to account in their fuel planning for the possibility of abnormal operations."*

The Chief Commissioner should explain how a pilot is meant to plan for the possibility of abnormal operations (by calculating off track CP and PNR) when the procedures to perform such calculations did not exist in the operations manual? How is a pilot to comply with a procedure which does not exist?

Despite the ATSB finding that the crew did not carry full fuel, the carriage of contingency fuel had no bearing <u>on preventing the outcome on the 18 November 2009.</u>

If there is NO methodology in which to do so, as required by the regulations, it remains a significant safety oversight by the operator, and was not analysed by the ATSB. The ATSB are happy to highlight the pilot failed to carry the fuel, but excuse any criticism of the operator breaching the regulation in failing to write a procedure instructing how to calculate it. It seems the ATSB cherry pick what "violations" suit an outcome.

The operators manual clearly gives the authority to the Pilot in Command to continue to the destination on the basis that two separate runways were available and that the weather described in the reports and in the amended 0803 TAF, would still allow a safe landing. The last line of defence argument by CASA is voided completely as <u>CASA accepted this procedure as a way for the operator to comply with the legislation and regulations.</u>

6. Weather

In addition, the BoM did not reissue an amended forecast until 0958 UTC for conditions below the alternate minima. The aircraft arrived overhead Norfolk Island at approximately 1000 UTC. That updated forecast still did not forecast weather below the landing minima. A TEMPO (temporary one hour periods over 1000 UTC to 2359 UTC)) was forecast for significant weather at 500 ft and a visibility of 4000m in showers/rain. The landing minima for Rwy 29 was 484 ft and visibility of 3300 metres.

The AUTO reports coming out in the METARS and SPECI showed the significant weather at 200 ft at times, yet the BoM did not reflect this in their forecast. CASA have stated the pilot 'should have' diverted on the trends in the weather, but how can CASA hold a pilot to a higher standard than the approved science trained forecasters? How can the pilot in command be expected to forecast weather if the experts cannot? A pilot is only a de-facto approved observer for the purposes of assessing visibility for take-off and landing.

Past the LPSD, the extra fuel (full tip tanks) which CASA and ATSB say the pilot should have uplifted would have only delayed the ditching, as the weather did not change for over two hours.

The Director of Aviation Safety also made the following comments: *"Of course the things you have to take into account via airmanship is the trend of the weather. If you had been following the weather, as Mr James had been given the weather numerous times, you develop a picture of where the weather is deteriorating or whether it is not; and whether you are going to an airfield that has only one runway or more than one runway."*

The temperature and pressure did not change more than two degrees and hectopascals from **0530 to 1000** and the wind direction changed from a calm north westerly to a calm south westerly.

As Norfolk Island has a history of unreliable forecasting, which the Director of Aviation Safety acknowledged it is a "tricky place to fly to", it would be safer to have 'approved weather observers' who look at the entire celestial dome around the aerodrome. The automatic weather station (AWS) only looks at cloud from a single vertical radar return.

As stated in my first submission, the reports of weather given to Mr James was marked "Auto" meaning it was from the automated weather station. The AIP states repeatedly to use weather reports from automated weather stations with "Caution" (see AIP GEN 3.5-26, 12.5.2, 12.8.1, 12.8.2, 12.11.1, 12.14.1). Yet, no explanation is provided of what this caution is meant for a pilot making in-flight decisions. Does this caution infer the AWS are unreliable? Or, does this mean to treat reports marked "Auto" with scepticism?

If we look at the trends the Director of Aviation Safety was discussing, there were two reports that indicated at 0856 UTC and at 0900 UTC that the weather was suitable. The pilot reported his LPSD as being at around 0845 UTC.

If this flight was delayed at departure by 10 minutes and left Samoa at 0555 UTC, the crew would have received <u>at their LPSD,</u> the following SPECI issued 0856 UTC:

SPECI YSNF 18**0856Z** AUTO 21007KT 9999 SCT005 SCT012 OVC015 20/19 Q1013 RMK RF00.0/000.0
which reported conditions <u>above the alternate minima.</u>

and METAR issued 0900:

METAR YSNF 180900Z AUTO 20007KT 8000 SCT005 OVC015 20/19
Q1013 RMK RF00.0/000.0

which reported conditions also above the alternate minima:

Both SPECI and METAR show no significant weather below the alternate minima. In fact they show that the weather was improving.

The point being made is that Norfolk Island is a difficult place for which to forecast the weather. The pilots should not be held to account for failing to correctly predict the weather when the BoM itself could not do so. Furthermore pilots are NOT trained or qualified weather forecasters and were they to act as such (as the Director is implying they should), aircraft would be carrying alternate fuel when it was not required and not carrying it when it was based on gut feel and vague concepts of airmanship.

Bottom line: A PILOT IS NOT A QUALIFIED WEATHER FORECASTER!

At the November 2012 hearing in relation to weather reports the Chief Commissioner stated:

Chief Commissioner: *There is probably one point to be made there. To take your road parallel, the equivalent would be if the second report you received said 'urgent weather update', because, in transmitting the second report, the air traffic controller contacted the aircraft and then said:*

… this the latest weather for Norfolk … SPECI … I say again special weather Norfolk at 0800 Zulu …
SPECI means that there has been a significant shift in the weather conditions at the reporting site. That is what SPECI means, and, 'SPECI, I say again SPECI,' is the message that went through

The Chief Commissioner does not mention what a SPECI actually means:

AIP GEN 3.5-8 paragraph 4.3:

SPECI are aerodrome weather reports issued whenever weather conditions fluctuate about or are below specified criteria

At the Bureau of Meteorology website, a PDF is available for METAR/SPECI weather products (Appendix E), and states:

SPECI is also used to identify reports of observations recorded 10 minutes following an improvement in visibility, weather or cloud to METAR conditions.[5]

This means, in the case of the SPECI at the time of issue of 0800, if the crew did not hear the correct syllable in the HF transmission, the automatic weather station could have observed over a period of 10 mins prior, an improvement in weather of no significance. The crew may well have heard the words " SPECI, I say again SPECI", however it is plausible and very likely he heard a cloud amount above what CASA and ATSB assert. The word SPECI in a weather report, also indicates that the weather is improving and is suitable.

Without the cockpit voice recorder we will never know what the crew heard. Both crew stated they did not hear that cloud level of one thousand one hundred. It is common to mishear transmissions on HF.

[5] Aviation Weather Products, METAR/SPECI, Australian Government, Bureau of Meteorology available online

7. Bureau of Meteorology

If the BoM cannot forecast the weather in a timely manner with radar, satellite photos, weather data and BoM personnel on the Island, it is illogical that a pilot with a good forecast and only reports can.

8. Communications difficulties with HF Radio

The Chief Commissioner in the 21 November hearing was asked about the radio reception problems by Senator Xenophon:

Senator XENOPHON: *There is an issue of who heard what. How many times did the pilot in command or the first officer say 'say again'? Can I suggest to you that it was said on number of occasions in the transcript?*

Mr Dolan: *According <u>to our transcript it was one time</u>, I think.*

Senator XENOPHON: *I think it was several times to Fiji.*

Mr Dolan: *Are we talking about these two specific transmissions?*

Senator XENOPHON: *No, I am saying that in the transcript that you have, in terms of the communications with Fiji, the pilot actually said on several occasions 'say again'. If a pilot says 'say again', does that indicate to you perhaps a lack of clarity or some communications problem? We are assuming that Mr James's hearing was reasonable. Assuming that he has relatively normal hearing, if a pilot says on several occasions 'say again', would that tend to indicate some form of communications problem?*

Mr Dolan: *I only have a partial transcript in front of me, so I am happy to take it on notice.*

Senator XENOPHON: *Could you take it on notice. Furthermore, if it is shown that there were several occasions when the pilot said 'say again', would that tend to be indicative of some form of communications issue?*

Mr Dolan: *Yes.*

Senator XENOPHON: *Is that a yes or a no?*

Mr Dolan: *Yes, I am happy to take that on notice and get back to you.*

Senator XENOPHON: *But would you agree that, if someone keeps saying 'say again' to air traffic control, that could indicate some sort of problem?*

Mr Dolan: *<u>It could indeed.</u>*

Senator STERLE: *By the same token, if they say 'thank you', they have got it clear.*

Senator XENOPHON: *But this is 'say again'.*

Mr Dolan: *We will take it on notice. The point I am making is that, on the transcript that is available to me, the only reference we have to 'say again' is a transmission by the aircraft to Nadi—having completed that first weather update, the METAR—saying:*

Ahhh … copy … just say again the issue time for the METAR

So specifically there appears to have been some problem in either understanding or hearing the issue time for the METAR".

I am only in the possession of the partial transcript given to Mr James which does not indicate it includes the entire flights radio transmissions. The words "say again" appear on the transcript (attached as Appendix C) seven (7) times:

@ 0600 Auckland ask NGA "say again station calling"

@0607 **NGA** ask Auckland "say again last "

@0628 **NGA** ask Auckland "say again requirement"

@0629 Auckland ask **NGA** "Roger, say again min altitude"

@0637 Auckland ask **NGA** "say again time APASI?"

@0716 Fiji ask **NGA** "say again estimate DUNAK"

@0801 **NGA** ask FIJI " say again issue time"

In the two hour period shown, transmissions had to be repeated seven (7) times. This is typical of HF. The Chief Commissioner stated in response to Senator Xenophons' question:

Senator XENOPHON: *But would you agree that, if someone keeps saying 'say again' to air traffic control, that could indicate some sort of problem?*

Mr Dolan: *It could indeed.*

On this basis alone, the ATSB report should be withdrawn and the investigation re-opened.

There is evidence that the land based HF receiver aerials recording the transmissions did not reflect what the ATS controllers heard. Both Auckland and Fiji ask VH-NGA four times to "say again" in the transmissions between 0600 to 0801.

A clear recording of a transmission from a receiving aerial in Auckland, cannot guarantee the crew heard the same thing in the absence of the Cockpit Voice Recorder.

Additionally, Mr James requested a copy of the HF recordings from the ATSB, which they refused. Only after Mr James instructed them he wanted copies, they allowed him to go to an ATSB office and only listen to the recordings of the flight through earphones. This would prevent Mr James recording the playback from a speaker. The quality of the transmissions according to Mr James were not high at all. He was not allowed to write notes.

Mr James also wrote to the ATSB requesting an analysis on the poor HF variability. Despite this, the ATSB state in their Final report on page 17:

"Communications with New Zealand and Fiji ATC were via HF radio, which gives a longer range but provides a lower quality output. Differing HF frequencies may be required depending on the ambient conditions and the time of day.

No difficulties were identified by the flight crew with their radio communications during the flight".

In Mr James conversations with the Investigator, Mr James stated the radio transmissions were poor. This was additionally formalised by Mr James in his DIP response dated 15 May 2012, which reads:

"15 May 2012

To General Manager, Aviation Safety Investigations,

These are my comments re the draft report AO-2009-072 (ditching of Westwind at Norfolk Island 2009):

- *Meteorology: The report does not adequately review the quality of the forecast provided by the Bureau of Meteorology (BoM) that was obtained before the accident flight, in comparison to the observations issued around the time of the flight. Additionally, the changes to forecasting policy and practice at Norfolk Island by the BoM in recent years (considering the previous weather incidents at Norfolk) is not addressed.*
- *Pel-Air. There is no analysis of the organisational issues at Pel-Air, which should include:*
  - *flight planning*
  - *fuel policy*
  - *flight training*
  - *SMS implementation (including Risk Management)*
  - *fatigue risk management:*
    - *within the company generally*
    - *for the accident flight*
  - *the quality of the Pel-Air fatigue program 'FAID'*
- *CASA: There is no discussion regarding the fuel carriage regulations, considering the ATSB had made prior recommendations for these to be reviewed.*

- *ATC: There is no analysis of the role ATC and the Norfolk Island UNICOM played in the accident.*
- *Communications: There is no discussion of the vulnerabilities of HF and its limitations.*
- *There is no Human Factors analysis.*
- *There is inadequate analysis of the crash survivability issues.*
- *There are numerous inconsistencies as per ICAO Annex 13, such as analysis appearing within the factual information, selective reproduction of factual information as well as non standard formatting of the report.*

In summary the DIP lacks thorough analysis and is superficial. This accident has all the hallmarks of an organisational accident and should be considered as such, with a comprehensive report reflecting this. Considering it has taken two and a half years to produce the draft, there has been ample time to analyse the accident in this manner, however there is no evidence of this work being done in the draft report.

Regards, Dominic James.

9. Organisational Safety

Director of Aviation Safety: *Systemic and organisational issues normally take place up to the rostering of the pilots to conduct the flight. In the end, the pilot himself is responsible. Again in the Pel-Air special audit we did, you will find that no pilot in Pel-Air that we interviewed considered that they would have difficulty if they told the operator that they were too fatigued to fly*

In regards to the comment that the organisation and systemic issues have no bearing on a an aircraft after it departs, this statement is refuted by decades of contemporary system safety research. Aviation, like other forms of critical safety dependent industries, is regarded as a complex socio-technical system.

Literature by Professor Nancy Leveson, the head of the Department of Aeronautics and Astronautics at MIT is regarded as a world leading expert in safety systems, and uses the analogy of the Union

Carbide accident in Bhopal India as a poignant example of complex systems migrating to heightened states of risk through small deviations:

"The safety control structure often changes over time, which accounts for the observation that accidents in complex systems frequently involve a migration of the system toward a state of heightened risk where a small deviation (in the physical system or in human behavior) can lead to a catastrophe. The foundation for an accident is often laid years before the loss actually occurs. One event may trigger the loss but if that event had not happened, another one would have. The Bhopal MIC (methyl isocyanate) release, which is among the worst industrial accidents in history, ***was blamed by Union Carbide and the Indian government on human error, namely the improper cleaning of a pipe at the chemical plant****. However, this event was only a proximate factor in the loss. Degradation of the safety margin at the Union Carbide Bhopal plant had occurred over many years, without any particular single decision to do so, but simply as a series of decisions that moved the plant slowly toward a situation* ***where any slight error would lead to a major accident****. An argument can be made that both the Challenger and Columbia losses involved this type of long term degradation of safety margins and increasing system risk [Leveson, 2004]. "*[6]

(My bold and underline)

Other doctoral level research at MIT elaborates further on any number of small events triggering large accidents:

"In effect, complex socio-technical systems have a tendency to slowly migrate from a safe state toward a higher-risk state, where they are ***<u>highly vulnerable to small disturbances</u>****. Once the system operates in this high-risk state, any number of different seemingly inconsequential events can lead to an accident* ***<u>. If one event does not trigger the loss, another one will</u>****. The Bhopal accident provides a good example of a system operating in a high-risk state [Leveson, 2006]. The release of methyl isocyanate from the Union Carbide chemical plant in Bhopal, India, in 1984 caused 2000 human casualties, 10,000 permanent disabilities, and over 200,00 injuries, arguably making it the worst industrial disaster in history [Shrivastava, 1992; Leveson, 1995]. The accident was officially blamed on human error as the worker assigned to wash out some pipes and filters in the plant did not insert a safety disk as required. Without the safety disk, wash water leaked through a faulty valve and came in contact with methylisocyanate. The resulted chemical reaction increased the temperature and pressure in the tank until the relief valve opened, releasing highly toxic chemicals in the atmosphere, which were then carried by the wind to populated areas.* ***<u>A more careful observation of the context in which the accident took place uncovers dozens of irregularities, disabled safety equipment, management negligence and regulatory deficiencies that all contributed to the accident. The Bhopal Union Carbide plant was a disaster waiting to happen. If the worker had inserted the safety disk on that day of December 1984, another small event or mistake would have eventually triggered an accident.</u>*** *Rasmussen [Rasmussen, 1997] explains this migration process:*

"The stage for an accidental course of events very likely is prepared through time by the normal efforts of many actors in their respective daily work context,

[6] Safety and Risk-Driven Design in Complex Systems-of-Systems, American Institute of Aeronautics and Astronautics, 2004

responding to the standing request to be more productive and less costly. Ultimately, a quite normal variation in somebody 's behavior can then release an accident. Had this 'root cause' been avoided by some additional safety measure, the accident would very likely be released by another cause at another point in time. In other words, an explanation of the accident in terms of events, acts, and errors is not very useful for design of improved systems [Rasmussen, 1997]. "[7]

(My bold and underline)

Using the analogy of the example of the Union Carbide accident cited by Leveson and Dulac, the ATSB report has viewed the pilot as the "worker", who did not put the safety disk in place, and was the result of "poor workmanship" and "good workmanship" should have prevented the accident. The company who rostered "the worker " on to do the maintenance had nothing to do with the "poor design of the system, the numerous regulatory breaches, the disabled safety equipment, and the management negligence".

To continue with the same analogy, with the new "Beyond Reason" approach to investigation being advocated by the Chief Commissioner, the entire Union Carbide accident would have been described by the ATSB as the "workers fault" as he was the last line of defence.

Aviation accidents like other complex socio-technical systems, is observed in further research that humans actions often appear rational given their understanding or because system design encourages incorrect behaviour:

"Accidents are rarely caused by simple, random component failure. Component failures that appear random at first sight often turn out to be caused instead by inadequate maintenance or by using the component in a way for which it was not designed. Similarly, accidents are usually not caused by simple human error either: humans often take actions that contribute to accidents because those actions appear rational given their understanding of the situation or because the system design encourages incorrect behaviour"[8]

Further, research identifies that accident investigation agencies strive for blame free reports but struggle with methodologies which require causality, do not consider systemic factors and leave individuals appearing culpable:

"Accident analysts also lack a method for framing and connecting human and organizational factors to the technical system failure or loss event [77]. Accident analysis is used to examine the safety of a deployed system after it has failed. Safety professionals have attributed 70 to 80% of aviation accidents to human error [75]. Recently, accident analysts have also begun to cite organizational factors as contributory causes of accidents. While analysts have long known that the human and organizational aspects of systems are key contributors to accidents, they lack a rigorous approach for analyzing their impacts.

In particular, accident analysts justify blaming operators based on confusion between data availability and data observability [19]. Data availability is information that was present at the time of an accident but could have been buried deep in a hierarchical user interface or obscure dial, for instance. Data observability is data that could actually be observed given all of the pressures and tasks that were actually occurring. Without being inside the mind of an operator, it is impossible for analysts to know which data was available but not observable. It is common in accident reports to blame the operator for missing important information. For example, in a recent oil company accident,

[7] A Framework for Dynamic Safety and Risk Management Modeling in Complex Engineering Systems, Doctoral dissertation Nicholas Dulac MIT 2007

[8] A New Approach to Risk Analysis with a Focus on Organizational Risk Factors, Doctoral dissertation MIT 2005

the operator had two level gauges available to him. The operator used one of the gauges to make control decisions but did not know that it was broken. The second, redundant gauge information was obscured within the user interface. Nevertheless, the operator was deemed negligent [85].
Many accident analysts strive for blame-free reports that will foster reflection and learning from accidents ***but struggle with methods that require direct causality, do not consider systemic factors, and seem to leave individuals looking culpable*** *[77] [79] [80]. Safety professionals make do with ad hoc methods that do not help guide investigations or help them determine which human and organizational data is relevant and which is not. In particular, investigators are not sure which people to interview or what questions to ask [62]. An accident investigation method is needed that will guide investigations, aid in the analysis of the role of humans and organizations in accidents, and promote blame-free accounting of accidents"*[9]

In another complex organisational accident, a Royal Commission into the catastrophic gas plant explosion in Victoria in 1998, is summarised in research from the University of Stavanger in Norway.[10] The researchers reported that even though the company blamed the workers had violated a process identified in training, the Commission found that workers were inadequately trained and as a result of a lack of supervision. They emphasise the point that operator error does not adequately account for complex organisational accidents:

2.3. Human and organizational factors and major accidents

For a long time, it was assumed that occupational accidents were a relevant basis on which major hazard risks were judged. Occupational accidents were often judged to be a result of human error. In the late 1990s,in the Norwegian petroleum sector, it was apparent that occupational accidents were not relevant for evaluation of major hazard risks, at least to the authorities and their advisors. Unfortunately this was not apparent globally. One of the main findings after the Texas City refinery explosion in 2005, was that major hazard risks had not been evaluated properly on the basis of occupational accident statistics [43]. In the same way, human error was judged to be the root cause for several major accidents, for example, in the case of the accident at Esso's gas plant at Longford, Victoria, in Australia in September 1998 [44]. This was the position taken by Esso at the Royal Commission. The company argued that operators and their super- visors on duty at the times should have known that the attempt to reintroduce warm hydrocarbons in liquid phase could result in brittle fracture of the steel and release of hydrocarbons. The company claimed that operators had been trained to be aware of the problem and Esso even produced the training records of one operator in an attempt to show that he should have known better. However, the Commission took view of the fact that none of those on duty at the time understood just how dangerous the situation was, indicating a systematic training failure [45]. Not even the plant manager, who was away from the plant at the time of the incident, understood the dangers of cold metal embrittlement. The Commission concluded that inadequate training of operators and supervisors was the 'real cause' of the accident. Therefore, it is clear that operator error does not adequately account for the Longford incident. According to Reason [46], this is a general finding of all inquiries into major accidents.

10. "Beyond Reason", why the ATSB do not investigate violations

Contrary to contemporary safety research is the "Beyond Reason" methodology spoken of by the Chief Commissioner of the ATSB.

Chief Commissioner *"As the committee knows, we are specifically prohibited from apportioning blame, from providing the means to determine liability and from assisting in court proceedings"*

[9] Accident analysis and hazard analysis for human and organizational factors doctoral thesis Margaret Stringfellow MIT October 2010
[10] Skogdalen,J.E.Vinnem, Quantitative Risk Analysis Offshore- Human and Organisational Factors from the journal of Reliability Engineering and System Safety (2011)468–479 471

The Chief Commissioner's statement is not correct. The ATSB in fulfilling their core functions can make observations from which others could infer blame or liability however the ATSB reports are not to be used for blame or liability in the judicial process.

The Chief Commissioner has painted an opaque picture. When we examine the Explanatory Material of the Transport Safety Investigation Act, it is very clear in reading the intention of the parliament in 2003:

"Clause 27 Reports not admissible in evidence

Subclause 27(1) *makes investigation reports inadmissible in evidence in civil or criminal proceedings whether through inadvertent disclosure or in contravention of this part of the Bill. This subclause sends a clear message that such information is to be used for the* ***purpose of safety only and should not to be used in the judicial system for the purpose of blame or liability,*** *otherwise it could prejudice the free flow of safety information in future transport safety investigations."*

(my bold and underline)

12AA of the Transport Safety Investigation Act states the following:

"(3) The following are not functions of the ATSB:

(a) to apportion blame for transport safety matters;

(b) to provide the means to determine the liability of any person in respect of a transport safety matter;

(c) to assist in court proceedings between parties (except as provided by this Act, whether expressly or impliedly);

(d) to allow any adverse inference to be drawn from the fact that a person was involved in a transport safety matter.

However, even though blame or liability may be inferred, or an adverse inference may be made, by a person other than the ATSB, this does not prevent the ATSB from carrying out its functions."

(my bold and underline)

The Act spells out that (3) (a) (b) (c) and (d) , but this does not prevent the ATSB from carrying out its core responsibility. The explanatory material makes it clear as well as the Act, that the blame and liability provisions are specifically to exclude the ATSB reports for their use in the judicial process, NOT to exclude the ATSB from making those observations. The Act specifically allows the ATSB to infer blame and liability and to carry out their function if blame and liability is inferred.

The Chief Commissioner suggests that the reason ATSB does not include CASA and the operator in their report is because the ATSB just looks at "errors" not "violations".

This is perhaps the most bizarre and illogical comment the head of an aviation safety investigation agency could make. To suggest that inadequate regulatory oversight or inadequate regulatory guidance could not have a direct relationship with 'error' or could not be improved to minimise 'error' is absurd. It contradicts the ATSB's own research in the relationship of Human Factors Classification and causal links to regulatory oversight.[11]

The following is an extract from the Hon. John Anderson, the then Federal Transport Minister on the second reading of the Bill of the Transport Safety Investigation Act 2003, in the House of Representatives:

*"The key principles of **best practice safety investigation reinforced by the Bill include operational independence free from external pressures and conflicts of interest along with professionalism, skill and objectivity.** Without these, the transport industry may be less confident and willing to accept and act upon the recommendations of an investigation. The public may insist on a much more expensive judicial inquiry.*

*Central, is ATSB's independence from parties or actions that may have been directly involved in the safety occurrence or that had some influence on the circumstances or consequences of that occurrence. For example, the ATSB must be free to investigate and comment on any significant role of the regulator in a particular occurrence and as such must not itself play a regulatory role in the industry**.** The Executive Director is also not subject to a direction by the Minister or the Secretary in relation to the exercise of powers under the Bill. The Minister can direct that an investigation be initiated.*

More complex safety investigations, where a significant safety benefit is judged likely, will be conducted systemically. Looking beyond the proximal causes of an accident or incident to an understanding of underlying factors, such as organisational issues, has the potential to reveal aspects of broader safety issues that may need to be addressed. Professor James Reason's model of hazards and defences has been adopted by key international bodies such as International Civil Aviation Organization and the International Maritime Organisation as the recommended investigation methodology. According to Reason, most accidents and incidents involve human factors and in 90 per cent of such cases no malice is intended.

*Often referred to as the 'no-blame' approach, **it does not equate with 'no responsibility'**. It simply means that disciplinary action and criminal or liability assessment are not part of an ATSB safety investigation and should, if necessary, be progressed through separate parallel processes. Witnesses, particularly operational*

[11] Evaluation of the Human Factors Analysis and Classification System as a predictive model, ATSB 2011

crew who may be in possession of vital safety information, must be free to provide this information to the ATSB without fear of self-incrimination or retribution."

(my bold, underline and italic)

Clearly, the intent of the parliament was for the ATSB to apportion causality, attribution and/or responsibility to individuals, regulators and/or organisations with the use of the Reason model as the basis of the international best practice.

That has been at the heart of aviation safety investigation in Australia for decades and was endorsed by the parliament with the commencement of the Act in 2003.

I have included an example of a prior ATSB report which I have highlighted would not have been investigated if it occurred in 2009 under the new "Beyond Reason" approach. The safety outcomes from that incident bore considerable safety improvements for EMS helicopter operations. However, as it was a "violation" by a pilot, the ATSB would not investigate as "Beyond Reason" only looks at "errors". (Appendix A)

11. Conclusion

In the Norfolk Island accident report, contrary to the intentions of the parliament, the ATSB has attributed the majority of the responsibility of the entire accident sequence to the individual, and deliberately downplayed both regulator and organisation attribution. Despite the evidence that the Bureau of Meteorology could not forecast the weather correctly (see Chapter 6 Weather) CASA has repeatedly asserted the pilot should be held to a higher account of weather interpretation and prediction.

The numerous breaches identified in the CASA Special Audit (as well as other audits obtained under Freedom of Information request) were not regarded with any significance by the ATSB and the Final Report emphatically confirms this. In the case of the regulator the confirmation is more subtle. The changes proposed by CASA to Part 135 of the Civil Aviation Safety Regulations suggests that it believed that a change to its regulations with regard to in-flight decision making following an unexpected change to an aerodrome forecast was warranted. The ATSB initially correctly identified this as a critical safety issue but downgraded its significance over time.

How the ATSB can make the statements that, amongst others, the operators procedures complied with the regulations is incorrect . The ATSB was held in high regard by international agencies for its detailed world leading human factors analysis, technical analysis and its ability in getting to the real issues in aviation safety. Without that prior work, such as Monarch Airlines and Seaview, to name a few, we would not have advanced an inch in aviation safety.

It seems, according to the ATSB, that we are in a regulatory Utopia.

It appears the days of continuous learning to improve the design of our aviation system is not required and that all accidents are the result of "errors" of engineers and / or poor "airmanship" of pilots. It is indeed an admonishment on our aviation system if a regulator cannot accept objective criticism from an "independent" agency and see it as the inevitable learning function of our aviation system at work. Learning like this should not be taken as a failure, rather as an improvement opportunity. No system remains stagnant. At the core of Safety Management Systems is the "continuous improvement" of the system. The same applies to the State Safety System.

To this day, operators, manufacturers and the public have not been told, which life jacket models failed. Just this fact alone means that thousands of safety devices have not had checks.

If the ATSB suggest that agencies and organisations are best placed to effect safety change, can they provide evidence that they advised the life jacket manufacturers and operators of these failings?

How are operators and manufacturers supposed to learn this otherwise?

This is striking evidence that our aviation safety investigation ability has been diluted to the point where not even lifesaving equipment makes it into the ATSB report.

What we used to have was two "independent" agencies sitting at the table. What we have now, is two "independent" agencies in an opaque relationship. Their primary and only purpose is to assist the safety of the travelling public, not protect each agency from the public.

I am not the only accident investigator who sees the evidence which demonstrates that the quality and comprehensiveness of the ATSB investigation reports is diminishing. There are cases of the ATSB in the last three years of not seeing the most obvious errors in accident sequences. In just once instance, I have personal experience where the ATSB <u>did not identify that the operator used the incorrect aircraft model for its weight and balance calculations in an accident.</u>

If CASA and the ATSB did not act in concert as they both deny, the only logical conclusion which can be made is the investigation methodology of the ATSB is completely flawed.

If the ATSB methodology cannot identify just nine of the failed defences in this submission and other submissions and address them by issuing safety alerts, safety notices or recommendations, than the ATSB methodology is flawed.

If the ATSB methodology cannot identify critical safety equipment failings and then alert industry, locally and globally about preventative maintenance of life jackets and where NOT to put life rafts when ditching an aircraft, then the methodology is flawed.

What is most alarming, is that there appears to be no interest in the fact that these defences and risk controls remain failed or absent, only repeated justification of why they did not investigate them.

To acknowledge in this case, that the last line of defence failed (as CASA suspended Mr James' licence) is an acknowledgement that our aviation safety system is extremely brittle given that at least nine obvious barriers failed or were absent.

Our aviation system will continue to lose resilience where the ATSB expects fatigued flight crew to compensate for significant systemic weaknesses. In this case the operator had breached over thirty four acts of parliament and regulations, had been issued a Safely Alert (see March 2008 CASA audit Appendix F) in the previous year because of fatigue issues, operated with a flawed fuel policy and ignored warnings by its pilots about RVSM issues.

There were gaps in the regulators guidance and regulatory material; the BoM did not update their TAF for Norfolk Island in a timely manner and ATS communication protocols were imperfect. As an integral member of Australia's State Safety Program it is the ATSB's job to identify systemic deficiencies and if necessary recommend changes to any element of our safety system including the regulations and procedures, and the Regulator; BoM; and AirServices Australia.

Their reluctance to do so means we still have many failed and/or absent defences remaining unchecked.

The next time anyone flies, they want to hope the life jacket under their seat is not the one which failed which the ATSB state state was "not a safety issue". Karen Casey will be reminded of this fact for the rest of her life.

We can all be thankful that Mr James carried that waterproof torch.

Yours sincerely,

Bryan Aherne

Attachment 1

Appendix A

For the benefit of the committee, I will draw on an ATSB report 200505107 from 2007 which I was the investigator in charge together with a human factors investigator, and air traffic control investigator. The ATSB of that time had a full understanding of the legislation, which Minister Anderson pointed out clearly in the second reading. I will outline the outcomes of that complex organisational investigation, in which no one was injured and was not an accident, but an incident.

A helicopter pilot flying a medical transfer at night, intentionally entered cloud and conducted a full instrument approach knowing he was not qualified nor the helicopter suitably equipped. I will demonstrate the investigation outcomes achieved by the ATSB in 2007 against the now "Beyond Reason" model the Chief Commissioner states is his view of the ATSB's responsibility only investigating "errors" NOT "violations":

" While the focus of our investigations is on error and understanding error—how to prevent it, how to detect it and how to deal with its consequences—there was also in this case an element of what, in Professor Reason's model, would be viewed as violation; and that is principally the responsibility of the regulator." pp 28 Hansard 21 Nov 2012

This ended the highly dangerous practice of Night Visual Flying in helicopters on aero-medical tasks, which in the past was so heavily criticised by coroners in the previous fatal accidents. The Queensland Government took the initiative and required all EMS helicopters to be Instrument Flight Rules capable.

ATSB Findings	**2007 Outcome**	***2012 ATSB Outcome on its "Beyond Reason" as directed by the Chief Commissioner***
• The pilot committed to a night Visual Flight Rules (VFR) flight on top of more than scattered cloud, despite being unable to assure himself that Visual Meteorological Conditions (VMC) existed for the remainder of the flight.	Reported and analysed	*Not reported under the ATSB new "Beyond Reason" methodology* *Under this new "Beyond Reason " approach the ATSB would not investigate this type of issue again*
• The pilot conducted an instrument approach and landing (IAL) procedure in meteorological conditions in which he was not qualified to operate, and for which the helicopter was not single-pilot instrument flight rules (IFR)-equipped	Reported and analysed	*Not reported under the ATSB new "Beyond Reason" methodology.* *Under this new "Beyond Reason " approach the ATSB would not investigate this type of incident again*
• The pilot committed to a night VFR flight on top of more than scattered cloud when he could not be confident that the meteorological information used to plan the flight was reliable and current.	Reported and analysed	*Does not fit into ATSB "error only" investigation philosophy*

• On receipt of a meteorological observation that indicated that VMC did not exist at Maroochydore, the pilot did not attempt to obtain the latest weather for Maroochydore, or any other potential alternative destination airfields	Reported and analysed	*Does not fit into the ATSB "error" only investigation philosophy*
• The pilot was unaware of the effect on the conduct of the series of flights of the requirements of Aeronautical Information Publication (AIP) ENROUTE (ENR) section 1.2.8.	Reported and analysed	*Intentional violation does not fit into ATSB "error" only investigation philosophy*
• The operator's Air Operator's Certificate (AOC) did not support the provision of instrument flying training	Reported and analysed	*Violations not investigated by ATSB, therefore the investigation would not have commenced*
• There was substantial evidence that the operator had previously engaged in night VFR operations in weather conditions that were less than VMC.	Reported and analysed	*Violations not investigated by ATSB, therefore the investigation would not have commenced*
• The reported conduct by the operator of night VFR operations in less than VMC was effectively never resolved by the Queensland Department of Emergency Services.	Reported and analysed	*Violations not investigated by ATSB, therefore the investigation would not have commenced*
Safety Actions The operator has undertaken the following safety actions: • in February 2006, all company pilots received Multi-Engine Command Instrument Rating (Helicopter) training • in July 2006, the operator commenced two-pilot instrument flight rules (IFR) operations in the BK-117 helicopter • • the Operations Manual was rewritten to include: • a check and training	**As a result of the investigation the following Safety Actions were directly attributed to the ATSB findings** This operator was the last night VFR EMS operation in Australia. Previous fatal accidents highlighted the highly dangerous practice of night visual flying on Emergency Medical Flights and the practice ceased. Money was found by the Queensland Government for the	*ATSB have not published the Norfolk Island accident operator safety actions. Violations not investigated by ATSB, therefore the investigation would not have commenced* *Likely that this would not be investigated* *Violations not investigated by ATSB, therefore the investigation would not have commenced EMS flying would still be performed by night VFR helicopters*

manual, which encompasses a cyclical pilot and aircrew training system • a comprehensive re-work of the company's night flying requirements which are, as a result, more restrictive than required by the Aeronautical Information Publication (AIP) • a night operations 'GO/NO GO' flow chart • the requirement for a risk management analysis in support of all proposed night operations • additional restrictions being placed on night visual flight rules (VFR) operations, in response to company concerns about the accuracy of meteorological forecasts and the compliance risk associated with marginal weather conditions • issued Operations Memo 06/137 to all pilots and aircrew on the company's night VFR weather planning requirements • counselled the pilot concerned • developed and implemented procedures to ensure that pilots are supported with relevant information while on task and the base is manned • provided additional safety-related training to company personnel • improved the induction training that is provided to staff to include risk management training • developed a monthly safety and risk management newsletter, which presents and explains safety and risk-related case studies.	operator to have licensed Instrument Rated Pilots and for the operator to become and IFR operation.	*Violations not investigated by ATSB, therefore the investigation would not have commenced* *No lessons learnt, no changes to the Operations Manual.* *Violations not investigated by ATSB, therefore the investigation would not have commenced* *No rework of the night flying requirements* *Violations not investigated by ATSB, therefore the investigation would not have commenced* *No flow chart created* *Violations not investigated by ATSB, therefore the investigation would not have commenced* *No risk analysis for every night flight* *Violations not investigated by ATSB, therefore the investigation would not have commenced* *No additional restrictions on VFR flights* *Violations not investigated by ATSB, therefore the investigation would not have commenced* *No memo* *ATSB does not report on "violations"*

		Violations not investigated by ATSB, therefore the investigation would not have commenced *No procedures developed*
In addition, as part of its normal surveillance program, the Civil Aviation Safety Authority (CASA) conducted two audits of the operator in the 15-month period since the incident. The first audit was carried out on 4 March 2006 and the second on 5 January 2007. The results of the March 2006 audit included a number of Requests for Corrective Action (RCA) and/or observations that were associated with identified deficiencies. The January 2007 audit, although including some recommendations or suggestions for improvement, commented positively on the progress made by the company since the 2006 audit and resulted in no RCAs. In addition, the CASA 2007 audit stated that: A strong safety culture has been developed with an emphasis on hazard and error reporting, comprehensive crew competency training and checking, and the introduction of IFR capability. An ethos of "safety first" has been inculcated, and reinforced by continued commitment from management.	Safety Actions	*Not reported under the ATSB new "Beyond Reason" methodology. It is likely according the Chief Commissioners evidence* *" While the focus of our investigations is on error and understanding error—how to prevent it, how to detect it and how to deal with its consequences—there was also in this case an element of what, in Professor Reason's model, would be viewed as violation; and that is principally the responsibility of the regulator." pp 28 Hansard 21 Nov 2012* *Violations not investigated by ATSB, therefore the investigation would not have commenced* *No Safety Actions*
This incident has, in part, served to reinforce the relevance and impetus for the Department of Emergency Services (DES) to continue to progress its safety action in response to the recommendations made by the Coronial Inquiry into the fatal accident at Cape Hillsborough,	Safety Action	*ATSB does not investigate "violations"* *No investigation to force the impetus of the previous Coronial Inquiry*

Qld on 17 October 2003 (see aviation safety investigation report BO/200304282, available at www.atsb.gov.au). In addition, the DES undertook safety action that was specifically related to this incident.		
Cape Hillsborough Coronial Inquiry The DES safety action that was commenced as a result of the Cape Hillsborough Coronial inquiry, and that has relevance to this incident, included the negotiation of new Service Agreements with the Community Helicopter Providers (CHPs). The new Service Agreements will require:		*Violations not investigated by ATSB, therefore the investigation would not have commenced* *No Safety Action*
• an IFR–capable, twin-engine aircraft as the primary aircraft	IFR Multi-Engine Helicopters and IFR rated Pilots put in place	
• all pilots to hold a current Command Instrument Rating		*Night VFR Helicopters would still be performing EMS missions*
• that single-engine VFR aircraft, which may be used as a back-up aircraft when the primary aircraft is unavailable, are to be used for daylight operations only.		*Violations not investigated by ATSB, therefore the investigation would not have commenced* *No Safety Action*
In addition, the Queensland Government provided additional funding in order for CHPs to upgrade their services to an IFR capability. The revised DES requirements, and allocation of additional funds, were to be included in new Service Contracts with the CHPs. The timeframe for the implementation of the revised Service Contracts was dependent on the CHPs' agreement to the terms and conditions of those revised contracts. In that regard, a number of outstanding issues have yet to be finalised with the CHPs, including:		*Violations not investigated by ATSB, therefore the investigation would not have commenced* *No Safety Action*

• the requirement for CHPs to obtain an Air Operator's Certificate (AOC), and the specified time-frame in which to acquire that AOC • aircraft down-time • the term of the Agreement. Finally, the DES has introduced a centralised auditing system, to ensure consistency of safety standards and to enable systems audit findings to be shared across the network. The audit reports will also be presented to a newly-established Emergency Helicopter Network Advisory Group (EHNAG), which includes representation from: • the Helicopter Services Unit • EMQ Helicopter Rescue • all Tasking Agencies (Queensland Health, Queensland Ambulance Service, Queensland Fire and Rescue Service, and Queensland Police Service) • the Queensland Emergency Medical System Coordination Centre (QCC) – the body responsible for tasking the aircraft for aeromedical tasks • the CHPs • the commercial service provider in the Torres Strait. The DES aim is that these arrangements will ensure that the key stakeholders in the emergency helicopter network are informed of any safety issues identified in the systems audits, and of the actions taken by helicopter providers to address those issues.		*Violations not investigated by ATSB, therefore the investigation would not have commenced* *No Safety Action* *Violations not investigated by ATSB, therefore the investigation would not have commenced* *No Safety Action*

Safety action specific to this incident The DES safety actions that are specifically related to this incident include: • the establishment of an incident reporting system to enable the sharing of accident and incident information across the network • strengthening the role of the Chief Pilot, EMQ Helicopter Rescue, in providing technical safety advice to the Helicopter Services Unit, and in liaising directly with the CHPs on safety matters.		
Airservices Australia Airservices Australia, in consultation with CASA, will amend AIP ENROUTE section 1.2.8 to explain the effect of that section of the AIP on each flight in a series of flights.	AIP ENROUTE amended	*Violations not investigated by ATSB, therefore the investigation would not have commenced and AIP ENROUTE would not be amended*
Civil Aviation Safety Authority CASA had previously identified VFR flight into instrument meteorological conditions (IMC) as a critical factor in many incidents. In response, CASA has published a number of articles on the topic in its *Flight Safety Australia* magazine. More recently, CASA's *Crash Scene Investigator* workshops examined the risks associated with VFR flight into IMC.	CASA workshops on risks associated with VFR into IMC	*Violations not investigated by ATSB*

Mr McCormack** "I know of no regulatory environment in the world—and there may be one, but I do not know of it—where there is a prescribed set of circumstances such that when the weather gets below the alternate planning minima you should divert the aeroplane. And I am talking about 747 400s down to any size aeroplane world wide" **PP 40 Hansard

***Mr McCormick:** It was a merit selection, Senator. And, as I said, there are only two possibilities about whether you divert or you do not divert, so you are going to have two schools of thought: either you do or you do not.*

***CHAIR:** That is like me saying, depending on what side of the bed I get out of, I am either right or wrong. Right is right and wrong is wrong. One of them has to be wrong. Why don't you sort out who it is?*

Mr McCormick:** Because it is not possible to be definitive. Senator, if you can point me to someone who can tell me how to write that regulation I will do it. **PP 42 Hansard

I have attached the ICAO guidance on this from Annex 6 Part One and I have quoted directly from the Hong Kong Civil Aviation Department 360.

ICAO Annex 6 Part One

Applicability
The present edition of Annex 6, Part I, contains Standards and Recommended Practices adopted by the International Civil Aviation Organization as the minimum Standards applicable to the operation of aeroplanes by operators authorized to conduct international commercial air transport operations. These international commercial air transport operations include scheduled international air services and non-scheduled international air transport operations for remuneration or hire.
In conjunction, these two types of operations include all international air transport operations conducted for remuneration or hire by aeroplanes. The distinction between them lies in the fact that scheduled international air services are especially provided for in the Convention in contradistinction to international air transport operations in general, of which non-scheduled international air transport operations for remuneration or hire were considered most urgently to require the establishment of International Standards and Recommended Practices. It is no longer considered necessary to differentiate in the Standards and Recommended Practices between scheduled international air services and non-scheduled international air transport operations.
The purpose of Annex 6, Part I, is to contribute to the safety of international air navigation by providing criteria of safe operating practice and to contribute to the efficiency and regularity of international air navigation by encouraging States to facilitate the passage over their territories of aeroplanes in international commercial air transport belonging to other States that operate in conformity with such Standards.

4.3.4.3 Destination alternate aerodromes
For a flight to be conducted in accordance with the instrument flight rules, at least one destination alternate aerodrome shall be selected and specified in the operational and ATS flight plans, unless:
a) the duration of the flight and the meteorological conditions prevailing are such that there is reasonable certainty that, at the estimated time of arrival at the aerodrome of intended landing, and for a reasonable period before and after such time, the approach and landing may be made under visual meteorological conditions; or
b) the aerodrome of intended landing is isolated and there is no suitable destination alternate aerodrome

4.3.5 Weather conditions

4.3.5.2 A flight to be conducted in accordance with instrument flight rules shall not be commenced unless information is available which indicates that conditions at the aerodrome of intended landing or, where a destination alternate is required, at least one destination alternate aerodrome will, at the estimated time of arrival, be at or above the aerodrome operating minima.

Note.— It is the practice in some States to declare, for flight planning purposes, higher minima for an aerodrome when
nominated as a destination alternate than for the same aerodrome when planned as that of intended landing.

4.4 In-flight procedures
Aerodrome Operating Minima
4.4.1.1 A flight shall not be continued towards the aerodrome of intended landing, unless the latest available information indicates that at the expected time of arrival, a landing can be effected at that aerodrome or at least one destination alternate aerodrome, in compliance with the operating minima established in accordance with 4.2.8.1.

4.4.1.2 An instrument approach shall not be continued beyond the outer marker fix in case of precision approach, or below 300 m (l 000 ft) above the aerodrome in case of non-precision approach, unless the reported visibility or controlling RVR is above the specified minimum.

4.4.1.3 If, after passing the outer marker fix in case of precision approach, or after descending below 300 m (l 000 ft) above the aerodrome in case of non-precision approach, the reported visibility or controlling RVR falls below the specified minimum, the approach may be continued to DA/H or MDA/F{. In any case, an aeroplane shall not continue its approach-to-land at any aerodrome beyond a point at which the limits of the operating minima specified for that aerodrome would be infringed. Note.- Controlling RVR means the reported values of one or more RVR reporting locations touchdown, mi &point and stop-end) used to determine whether operating minima are ol are not met. Where RVR is used, the controlling RYR is the touchdown RVR, unless otherwise specified by State criteria.

Civil Aviation Department Hong Kong June 1997
Air Operators Certificates
Operation of Aircraft Part One
Chapter 4 Operations Manual (Last amended April 2012)

http://gp.search.gov.hk/search?q=cache:A651502mR5sJ:www.cad.gov.hk/english/reports/CAD360_part1.pdf+cad+divert&output=xml_no_dtd&client=depts&proxystylesheet=depts&ie=UTF-8&site=cad_home&access=p&oe=UTF-8

Please see 8.5 and ***8.9 (specifically 8.10.4 clearly telling the operator specific guidance on diversion re weather and fuel)***

8
FUEL PLANNING AND MANAGEMENT - AEROPLANES
8.1
Basic Principles
8.1.1 The total amounts of fuel and oil carried on board an aeroplane must be sufficient for the intended flight and must include a safe margin for contingencies. The manner in which the amounts should be calculated and the records that should be made before, during and after flight must all be specified.
8.1.2 General considerations for calculating and recording fuel and oil requirements and usage are listed below. Instructions, similar to those given for fuel planning, should be

specified for calculating the amount of oil needed to lubricate the engine(s) and associated systems, and for recording before, during and after flight, as appropriate, the quantities on board.
8.1.3 Operators must ensure that their fuel planning policy allows for the carriage of additional fuel, wherever it is known or suspected that there may be excessive landing delays due to traffic or Air Traffic Control (ATC) problems at destination or diversion airfields. Furthermore, operating flight crews should be reminded that vigilance and early decision-making is necessary in exercising fuel management in order to ensure that the contingency, alternate and holding fuel allowances are not eroded to such an extent that operational safety is compromised.

8.1.4 There should be instructions and guidance on the effect on fuel consumption of engine or system failure. This could be a significant factor on long ocean or desert crossings, or where no suitable En-Route Alternates (ERAs) are available.
8.2
Basic Planning Tables
Fuel planning tables should be provided for all aeroplanes, except light single engine types. The tables must take account of aeroplane weight, outside air temperature and altitude and, where possible, head or tail wind components. Where tables are not provided, clear statements of the hourly rates of consumption must be made. All circumstances of flight that can reasonably be foreseen should be specified, including climb, cruise, descent, holding and abnormal configurations.
8.3
Planning Considerations
8.3.1 The following items should be included in the fuel planning process. The items may be combined but constituent parts of combinations should be fully described (see also paragraph 8.8 below):
(a)
Sector fuel: which comprises fuel required for:
(i)
take-off and climb;
(ii) cruise;
(iii) descent; and
(iv) approach to land;
(b)
Additional fuel: e.g. fuel required for:
(i)
start-up, taxy-out and power checks;
(ii)
use of an auxiliary power unit on the ground and in the air;
(iii) amounts used when operating de-icing systems and heaters;
(iv) lengthy standard departure and arrival procedures;
(v)
quantities known to be unusable; and
(vi) amounts required to compensate for potential delays en-route, such as weather avoidance.
8.3.2 Sufficient fuel must be carried to permit in the event of loss of pressurisation or the failure of a power unit at any point on the planned route:
(a)
the flight to be continued to a suitable aerodrome for landing;
(b)
to hold at 1500 feet over that aerodrome for 30 minutes; and
(c)
to carry out an approach and landing.
8.3.3 Where analysis of fuel records shows deterioration in performance of a particular aircraft compared to that predicted in the manufacturer's fuel flow tables, a percentage correction should be established and applied to sector fuel calculations.

8.4

Monitoring Fuel on Board

8.4.1 There must be instructions for ascertaining before departure that the amount of fuel on board meets the commander's requirements. There must also be procedures for ensuring that, if in flight the amount of fuel calculated to remain overhead the aerodrome of intended landing is likely to become less than any minimum quantity specified, this fact becomes apparent at an early stage.

8.4.2 Before signing the technical log record page, the commander must satisfy himself that the correct type and quantity of fuel is on board and that it has been loaded in accordance with any instructions that may have been given. Units of weight or volume shown on the sector record page must be the same as those on fuel gauges visible to the pilot. Exceptionally, where there is a difference between the units on the fuel gauges and those on the sector record page, use of conversion tables may be approved. To have loadsheet fuel recorded in kilograms, uplifts in litres and aircraft gauges calibrated in pounds is to be avoided. Operators should provide all flight crews with simple fuel conversion charts/tables to reduce the likelihood of errors.

8.4.3 Instructions must be given on the frequency of fuel checks, the recording of information and the application of that information. In-flight checks should be carried out at least once on every sector and at intervals not exceeding 60 minutes on flights longer than 90 minutes. A calculation to determine the amount of fuel remaining and to predict the amount of fuel expected to remain overhead the aerodrome of intended landing should follow every check.

8.5

Fuel Alternates

8.5.1 An aerodrome suitable in all respects for use as an alternate, if a landing cannot be made at the intended destination, must be identified on both the pilot navigation log (plog) and on the ATC flight plan.

8.5.2 When the planned alternate aerodrome is in the same busy area as the destination, for instance Hong Kong and Macau, the track miles on which the fuel requirement for flying to the alternate is calculated should be realistically assessed taking account of the extended routeing which can reasonably be expected during busy periods.

8.6

Minimum Fuel

8.6.1 Under ICAO terminology, 'minimum fuel' describes a situation in which an aircraft's fuel supply has reached a state where little or no delay can be accepted.

8.6.2 Minimum Fuel. For operations under a Hong Kong AOC, the minimum fuel with which the aircraft must land is an amount equal to 30 minutes holding at a height of 1500 ft at the planned landing weight. Where it becomes apparent that a flight is likely to land with less than minimum fuel, the commander is to declare an emergency.

8.7

ETOPS

Operations manuals should, if applicable, specify fuel planning requirements and procedures for flights operated under Extended Range Twin Operations (ETOPS) rules.

8.8

Fuel Planning - Specific Requirements

8.8.1 At the planning stage the quantity of fuel required to be on board before the aeroplane departs should be calculated and recorded. Only those procedures that are specified in operations manuals may be used.

8.8.2 Normal Planning. For most flights, the formula for calculating before flight the amount of fuel required is the sum of:

(a)
start-up and taxy fuel;

(b)
sector fuel;

(c)
alternate fuel, i.e. fuel for a missed approach procedure and then from overhead the intended destination airfield to a suitable alternate;

(d)
holding fuel, i.e. fuel to hold and make an approach at the most critical alternate aerodrome, calculated as follows:

(i)
in the case of propeller-driven aeroplanes, fuel to hold for 45 minutes and carry out an approach and landing; or

(ii)
in the case of turbo-jet aeroplanes, fuel to hold for 30 minutes at 1500 feet above the aerodrome under International Standard Atmosphere (ISA) conditions and carry out an approach and landing;

(e)
contingency fuel, i.e. not less than 5% of the sum of Sector fuel and Alternate fuel.

NOTE: Account should be taken also of additional amounts such as those listed in paragraph 8.3.

8.8.3 Use of En-Route Alternate (ERA). The normally calculated contingency fuel can be reduced by use of a nominated ERA as follows:

(a)
The ERA must be an adequate aerodrome which is open. The forecast weather must be such that a landing can be assured.

(b)
5% of the fuel required to fly from overhead or abeam the ERA to the destination may be substituted for the contingency element of sector fuel, but cannot be less than that required to cruise from that position for 5 minutes at the then all-up weight of the aeroplane.

8.8.4 Use of Remote Aerodromes. When the destination aerodrome is geographically isolated and has no suitable alternate within a reasonable range, the alternate and holding fuel can be substituted by a holding reserve. The following conditions shall be satisfied:

(a)
the holding reserve shall be not less than two hours fuel at normal cruise consumption at the all-up-weight applicable to arrival overhead the destination;

(b)
the holding reserve shall be related to statistical data on local weather conditions and sufficient for holding for a time period based on this data;

(c)
aerodromes designated 'Remote' shall be listed in the operations manual; and

(d)
the latest point of diversion between the remote aerodrome destination and a

suitable en-route diversion shall be calculated.

8.8.5 Reclearance in Flight. When a flight cannot depart with the total fuel calculated in accordance with the normal planning formula, dispatch may be achieved by the operator nominating a suitable aerodrome en-route as the destination with the intention of obtaining a reclearance in flight to the original destination, if the commander is satisfied that:

(a)
the nominated destination aerodrome is both suitable and available with the weather forecast satisfactory for landing; and

(b)
the fuel on board, when passing over or abeam the nominated aerodrome en-route, is sufficient to satisfy the normal planning formula from that point to the original destination.

NOTES:(1)
Pilot navigation logs must show the name of the aerodrome en-route that is used for this planning purpose; the weather conditions relating to both destination and nominated en-route aerodromes must be recorded.

(2) Some Authorities are not willing to have aerodromes in their jurisdiction nominated as a destination, if that is not the intention, as may be the case in this procedure.

8.9
Fuel Management - En-Route

8.9.1 *General Requirements.* Airborne fuel usage must be monitored, with the aim of ensuring that throughout the flight the fuel on board remains sufficient to satisfy the requirements listed below. Clear instructions must be given on the action the commander must take i.e. range of options requiring consideration, if at any stage it appears that the fuel on board is less than required.

8.9.2 *Company Minimum Reserve (CMR).* This is the minimum, normal fuel state on arrival at the destination missed approach point (MAP). It is the sum of:

(a)
The fuel required to proceed to the chosen alternate airport; and

(b)
Contingency fuel applicable to (a); and

(c)
Sufficient fuel to enable, in the case of turbojet-powered aircraft, the flight to hold for a period of 30 minutes at a height of 1500 ft at the aircraft's planned landing weight at the alternate airport.

8.9.3 *Use of En-Route Alternate (ERA).* For flights that use the ERA formula, on passing overhead or abeam the ERA, the fuel expected to remain at the MAP of the intended destination should not be less than CMR.

8.9.4 *Use of Remote Aerodromes.* For flights that use the remote aerodrome conditions, on passing the latest point of diversion the fuel expected to remain overhead the intended destination should not be less than the holding reserve. Crews must, before passing this point, obtain the weather conditions existing at the destination and a current forecast for the time of expected arrival.

8.9.5 *Reclearance in Flight.* For flights that use the reclearance in flight procedure, when passing over or abeam the nominated destination aerodrome (reclearance point), the fuel expected to remain at the MAP of the original destination should not be less than CMR.

8.9.6 *Fuel Balancing.* On multi-crew aircraft the instructions for fuel balancing must cover the following points:

(a) if an abnormal fuel feed procedure is used to balance fuel, the aircraft commander must be informed and at least two flight crew members must monitor the operation; and

(b) when balancing fuel on aircraft with more than two engines, one engine, where practical, should remain on direct feed from tank to engine. Preference should be given to an engine with an operative electrical generator and where applicable a hydraulic pump.

8.10 Predicted Reduced Fuel State - Destination

8.10.1 A fuel progress chart must be included as part of the CFP for each flight made for the purposes of public transport, in order to predict a flight's arrival fuel at its destination. Periodic entries made at regular intervals by the crew, enable a perception to be made of how well the flight is doing in relation to the planned fuel progression and enables the crew, at some point along the route, to determine with fair accuracy, whether the flight will arrive at the destination with the required amount of fuel – the CMR – on board.

8.10.2 *General Requirement*s. If it becomes apparent that the fuel remaining is close to the CMR, the commander must have clear instructions on the actions he must take. Whilst en-route, options generally available are:

(a) adjust aircraft speed;

(b) obtain a more direct routing;

(c) fly at a different flight level;

(d) land and refuel; or

(e) select an alternate aerodrome which is closer to the destination airfield than that specified in the ATC flight plan and so reduce the CMR.

8.10.3 Where a flight has been despatched with less than the required fuel, for example when utilising an ERA, early fuel checks will naturally show that the predicted fuel remaining will be less than CMR. As the flight progresses, updated assessments of the fuel remaining at the destination will continue to be made. The decision, in the light of the fuel required, regarding continuing to the destination or diverting to an en route airport, should be made at a point where diversion is still feasible.

8.10.4 If en route it becomes obvious that a flight will not arrive at the destination with the required CMR, the flight may continue to the planned destination, provided that the fuel remaining on landing will be not less than an amount equal to that which would enable the aircraft to hold for 30 minutes at 1500 ft at the anticipated landing weight – i.e. Minimum Fuel – and ALL of the following conditions are satisfied:

(a)
There must be at least two geographically separate runways available for use which meet the performance criteria for the aircraft; and

(b)
There must be no ATC delays forecast for the flight's ETA at the destination; and

(c)
The actual weather and that forecast for the flight's ETA at the destination must be at, or better than, the alternate planning minima for the non-precision approach aid with the higher minima serving the two runways being considered in (a) above and, in addition, the surface wind is within the normal crosswind limits for the aircraft type.

Where these conditions are not satisfied, the flight must **divert** to an en route airport for refuelling.

8.10.5 *After Commencing Descent*

If, after commencing descent, an unforeseen situation develops which may prejudice arrival at the destination MAP with CMR fuel, the flight may continue to the destination airport provided that the fuel remaining on landing will be at least equal to Minimum Fuel. However, the commander must, in electing to continue rather than proceed to the alternate, ensure that all relevant factors are taken into consideration with particular reference to the reason for the delay, weather deterioration and runway availability at the destination and alternate. If at any time it becomes apparent that a flight cannot be completed with Minimum Fuel available upon landing, an emergency must be declared.

8.10.6 *Delays Exceed Expectation.* Operators must make clear what action is to be taken by commanders, if the fuel remaining could reduce or has reduced below the amounts derived from the considerations listed 8.10.4 and 8.10.5.

9
FUEL PLANNING AND MANAGEMENT - HELICOPTERS

Cancelled - refers to CAD 360 Helicopter Supplement

10
CHECK-LISTS

10.1 The drills and checks to be followed including those for emergency and abnormal conditions should be listed in full in the operations manual in the form of expanded check-lists. In addition, abbreviated working check-lists should be provided on the flight deck for the use of the flight crew.

10.2 The check-lists and drill cards provided by an operator for use by his crews must correctly reflect the requirements, instructions, drills and procedures specified in the aircraft's Flight Manual.

10.3 Instructions on how to use the checklists and drill cards should be provided in the manual. For convenience in handling, the check-list for normal operations should be separate from the abnormal and emergency check-list. The colour of the emergency and abnormal check-lists should be sufficiently distinctive to avoid them being mistaken for other volumes. They must be stowed on the flight deck separately from other documents

in such a manner as to be immediately ready for use.
10.4 Separate check lists or drill cards must be provided for each flight crew member. In 'single pilot' aircraft, check lists can be supplemented by placarding vital actions for final approach and landing.
10.5 All check lists or drill cards must be of a quality sufficient to withstand heavy wear and remain legible. The design and utilisation of checklists shall observe Human Factors principles.
10.6 Details of cabin crews' ditching, crash landing and emergency evacuation drills should be readily available. This may be achieved either by issuing to each cabin crew a copy of their emergency drills - which they should be required to carry with them - or stowing the drill cards at appropriate positions in the cabin.
10.7 On multi-crew aircraft, instructions must be given that check lists are always to be used. On single pilot aircraft the operator may allow in-flight drills to be carried out from memory but must ensure that a check list is readily available to the pilot. Memorised drills must be carried out strictly in accordance with the check list and emergency drills must be verified as soon as possible by reference to the check list.
10.8 On multi-crew aircraft, drills should be so constructed that the handling pilot, as far as possible, has only to control the aircraft's flight path and cross check the correct selection of a lever or a switch before it is used. The use of responses such as "SET" or "AS REQUIRED" should be avoided and are better replaced by a specific indication of what is required.
10.9 Where emergency and abnormal drills do not include all the necessary items and actions to re-land, a clear instruction referring the crew back to the normal check-list must be made.

10.10 An abbreviated version of the normal check-list may be produced for use by training captains whilst on circuit training. This should retain the sequences of the normal check-list.
10.11 Each page of a check-list must be dated and the amendment state of the check-list ascertainable by means of a simple amendment record. This record should be incorporated at a suitable place in the check-list.
10.12 The following items, where applicable, must be included at the appropriate point in the normal check-list (the actual form of words may be varied):

(a) crew seats, seat belts and harnesses fastened/locked for take-off and landing;

(b) flying controls unlocked and checked for freedom of movement;

(c) cabin prepared for take-off and landing;

(d) reference speeds noted and/or bugs set and cross checked;

(e) instruments checked before take-off and prior to commencing approach;

(f) altimeters set and cross checked and required setting (QFE, QNH, QNE) at each stage of flight;

(g) pre-take-off/landing signal to cabin crew - PA or chime;

(h) radio aids set and identified (by more than one crew member on multi-crew

operations)
(i)
RTOW and performance data checked valid for runway in use immediately
before take-off;
(j)
performance data for approach and landing (normally before commencing
descent);
(k)
MSA check prior to descent.
10.13 There should be check-list prompts requiring the aircraft commander to brief the flight crew on the following topics:
(a)
Prior to take-off:
(i)
the actions to be taken if an emergency occurs during or immediately
after take-off;
(ii)
special techniques for take-off in crosswinds and on wet or otherwise
contaminated runways;
(iii) noise abatement procedures;
(iv) selection of radio aids; and
(v)
selection and checking of reduced thrust for take-off, when permitted.

(b)
Prior to landing:
(i)
selection of radio aids;
(ii)
missed approach procedures;
(iii) any special techniques or system configurations for landing; and
(iv) selected alternate for diversion.
NOTE: It is not necessary to include these items in detail if suitable instructions are
provided elsewhere. The word 'briefing' is sufficient at the appropriate points
in the check-lists.
10.14 Abnormal operation check-lists should include such drills as:
(a)
hydraulic failures;
(b)
fuel system failures;
(c)
air-conditioning/pressurisation failures; and
(d)
electrical system failures.
10.15 Examples of emergency drills to be covered are as follows: (Note - memory actions are annotated M)
-
engine failure on take off
* rejected take off at or before V_1 drill (**M**)
* after V_1 (instruction must be given that drills are **not** to be performed before

reaching a minimum safe altitude)
* engine fire/failure after V_1 drills, could include after take off check
-
engine shut down
-
engine fires (**M**)
-
propeller malfunctions (**M**)
-
fuel filter de-icing
-
relighting of turbine engines and relight envelope graph
* instant relight (**M**)
* normal relight
-
restarting reciprocating engines and restart envelope graph
-
bus bar and other serious electrical failures (**M**)
-
pressurization failures
-
emergency descent (**M**)
* to include use of oxygen mask and microphone (**M**)
-
malfunction of power control systems
-
cabin and hold fires

-
smoke removal
* to include maximum IAS for flight with direct vision window open if permissible
-
landing gear fires
-
landing
* with gear asymmetry
* with gear up
* ditching
-
evacuation drills
-
pilot cockpit pre-evacuation drills (**M**) following
* crash landing
* ditching
* rejected take off to be followed by evacuation
* normal landing, or
* at any other time whilst on the ground
-
imminent overrun of manoeuvring area drill (**M**)

-
bomb-on-board warnings.

11

USE AND CHECKING OF ALTIMETERS

11.1 Operators must have a clear policy on altimeter setting procedures, particularly their use of QFE and QNH; this policy must be clearly described in operations manuals to cover all phases of flight.

11.2 This policy must incorporate:

(a)
Pre-flight serviceability tests;

(b)
Flight crew altimeter setting procedures, including:

(i)
the setting to be used for each phase of flight;

(ii)
the correct challenge and response for altimeter cross-check(s), particularly during climb, descent and approach and when nearing an assigned altitude/level;

(iii) alternative settings and procedures, if appropriate, for use when QFE is either not available or cannot be used e.g. at high altitude aerodromes;

(iv) the manner of checking and of use of any radio altimeter(s) ;

(v)
special precautions to be taken if an altimeter is suspect or becomes unserviceable in flight;

(vi) confirmation that, unless special conditions exist, the standard setting procedure will be used irrespective of which seat the handling pilot occupies on take-off;

(vii) the annotation of check lists with the actual setting to be used e.g. QNH/QFE; phrases such as 'altimeters set' should not be used;

(viii) the correct report of altitude/level changes to ATC; such reports should **not** be made before reaching or leaving a particular altitude/level;

(ix) provision for one altimeter to be set to the appropriate QNH, when flying at or near to the MSA; this has particular relevance to single-pilot unpressurised aircraft.

(x)
a check of aerodrome elevation during the approach phase; this is to be cross-checked to establish the difference between QFE and QNH, when QFE is used for landing;

(xi) the procedure for indicating decision heights for landing, e.g. a figure in the navigation log, altimeter 'bugs' and/or landing data cards;

(xii) the requirement for crews to inform ATC prior to its commencement if it is intended to use QNH settings throughout a radar approach procedure;

(xiii) the calls to be made by monitoring pilots or auto calls during instrument approaches i.e. at the outer marker or equivalent, 500 feet above runway elevation, 100 feet above DA/DH or MDA and minima. The calls and responses required for approaches in Category 2 or 3

weather minima conditions will need to be specified in greater detail;
and
(xiv) the procedures to be used when flying in airspace where metric units are in use. If no metric altimeter is fitted, detailed instructions must be provided on the method of cross-checking conversions from metres to feet and vice-versa.

12

EMERGENCY EVACUATION PROCEDURES

Procedures for the evacuation of an aircraft and care of passengers following a forced landing, ditching or other emergency are to be specified. Much of the information will be descriptive but the basic drills to be followed by the various members of the aircraft crew must be summarised and tabulated. Particular attention should be paid to the following points:

(a)
the correct setting for pressurisation system controls prior to ditching;
(b)
the ground positioning of the aircraft relative to the wind, wherever possible, to allow for the safest possible evacuation in the event of an aircraft fire;
(c)
the use of emergency escape chutes and evacuation slides/rafts;

(d)
the fitting of life-jackets to small children and the use of flotation cots;
(e)
the briefing of passengers and warning of impact;
(f)
flight deck drills should be memory drills and all flight deck crew members should carry them out in a coordinated manner, when ordered to do so by the captain;
(g)
cabin drills should nominate individual responsibility for initiating evacuation and detail cabin crews' duties inside and outside of the aircraft;
(h)
the location and use of each item of emergency and survival equipment. Any variation between such equipment carried in individual aircraft of the same type must be shown;
(i)
the carriage of disabled passengers, how they are dealt with, should an emergency evacuation of the aircraft be necessary, and any need to carry additional cabin crew; the aircraft commander must be informed when severely disabled persons are on board; and
(j)
the procedure for warning the cabin crews of any emergency which might require the rapid evacuation of passengers from the aircraft.

NOTES: (1) Operators may be required to arrange a demonstration emergency evacuation, if concern arises as to the effectiveness of procedures that are proposed.
(2) If electrical power is maintained or re-applied after an accident or incident, the Flight Data Recorder (FDR) or Cockpit Voice Recorder (CVR) may continue to run and hence obliterate accident or incident

data. Crews should wherever possible ensure electrical isolation of the FDR/CVR, particularly if re-applying power.

13

RADIO WATCH

Radio watch instructions must contain the requirement for a continuous watch on operational frequencies not equipped with SELCAL and shall include the requirement for flight crews to monitor distress frequency 121.5 MHz at all times when operationally possible.

14

ROUTE GUIDE

14.1 The route guide provided in accordance with the provisions in Schedule 11 of the AN(HK)O should be a volume or series of volumes separate from the rest of the operations manual. Information in the AIP, AIC, NOTAM and AIRAC shall be taken into account in the development of route guide. Aerad, Jeppesen or similar publications will normally meet the requirement, provided that flight crews are given adequate advice on the route to be followed. An operator providing his own guide should ensure that it meets the needs of crews in every respect. If flights are to be made only on airways or Advisory Routes (ADRs), it will be sufficient to include instructions to that effect; otherwise routes regularly flown should be specified in detail, normally on prepared navigation flight plans. For other flights, routes should be specified in a commander's flight brief, a copy being retained at base.

14.2 Particular care should be taken to ensure that adequate information is provided on search and rescue facilities, obstructions in the approach pattern, radio failure procedures, prohibited and danger areas and standard Terminal Manoeuvring Area (TMA) routeings. Only recognised instrument approach or let-down procedures in general use should normally be included in the flight guide. Exceptionally, a special 'break cloud' procedure proposed by the operator may be considered by the **CAD**, provided it is acceptable to the appropriate Airport Authority. Proposals to use such special procedures, accompanied by the associated aerodrome operating minima, should be submitted to the Flight Operations Inspectorate.

14.2.1 Neither Jeppesen nor Aerad approach plates display the vertical limits of controlled airspace, although this information is available on some area and en-route charts.

14.3 Normally, the cancellation of Instrument Flight Rules (IFR) flight plans at night or in congested terminal areas should be prohibited and instructions to this effect included in the operations manual. If an operator does not wish to impose a total prohibition, detailed instructions should be included in the operations manual, setting out the minimum conditions that must be satisfied before cancellation of an IFR flight plan.

NOTE: Aircraft are not permitted to fly under VFR at night in HK airspace. A visual approach does not require the cancellation of an IFR flight plan (see ICAO definition of visual approach).

14.4 In some circumstances an abbreviated approach procedure may be adopted; the conditions under which this procedure may be followed should be detailed in the operations manual.

14.5 In order to facilitate effective monitoring of an instrument approach by members of the flight crew, operators of multi-crew aircraft should provide for use on the flight deck at least two copies of the Instrument Approach charts to be used.

15

METEOROLOGICAL REPORTS FROM AIRCRAFT

15.1 Reference to meteorological reports from aircraft in flight should be based on the information and guidance in the Hong Kong Aeronautical Information Publication (AIP) and/or on any special requirements of foreign authorities.

15.2 Reference to reports on volcanic activities from aircraft in flight and report made after landing should be based on the information and guidance in the Hong Kong AIP and/or on any special requirements of foreign authorities.

16

MINIMUM SAFE ALTITUDES

16.1 Minimum safe altitudes are to be prescribed by the operator for each sector from take-off, on each route to be flown, including routes to alternate aerodromes. For this purpose ‘sector’ means the intended track from a reporting or turning point to the next, until the aircraft starts the instrument approach procedure or joins the traffic pattern at the aerodrome to be used for landing. Minimum safe altitudes must be specified by the operator in the appropriate volume of the manual, in a prepared navigation flight plan or in the commander’s flight brief.

16.2 To provide the commander with guidance for the calculation of minimum safe altitudes, when he is obliged to depart from the planned or normal route, operators must include a formula in the manual, expressed as simply as possible, from which the minimum safe altitude can be calculated. The formula must secure at least the normal terrain clearance standards laid down by the operator,

16.3 When specifying minimum safe altitudes, operators must take account of local regulations.

16.4 The criteria upon which minimum safe altitudes are based, related to the track guidance facilities available to the commander. The minimum acceptable standards are as below; however such standards are modified when flying over high terrain or when the ambient air temperature is very low. These variations are covered in paragraphs 16.5 and 16.7.

16.4.1 *For general application.* Where the terrain or obstacle is 5000 feet Above Mean Sea Level (AMSL) or lower, the minimum safe altitude is 1000 feet above the highest terrain or obstacle within 20 nm of the route centre line. Where that terrain or obstacle is higher than 5000 feet AMSL, the minimum safe altitude is 2000 feet or more above the highest terrain or obstacle within 20 nm of the route centre line.

16.4.2 *For flight in controlled airspace.* Where the track is well defined by two separate aids, the minimum safe altitude is 1000 feet above the highest terrain or obstacle within 10 nm of the route centre line. Where the highest terrain or obstacle, within 10 nm of the route centre line, is higher than 5000 ft AMSL, the minimum safe altitude is 2000 feet or more above that terrain or obstacle. When the sector length between navigational aids which define turning points is such that the aircraft could be more than 5 nm from the centre line, due to inherent errors in the system used to define an airway, the limit of protection must be increased by the extent to which the divergence exceeds 5 nm.

16.4.3 *For radar controlled flight within 25 nm of the aerodrome of departure or intended landing.* The minimum safe altitude is 1000 feet above the highest terrain or obstacle within 5 nm of the intended track. Commanders must be instructed to monitor all radar instructions by reference to other aids and be reminded that, when under radar control, it is their individual responsibility to ensure adequate terrain clearance. Minimum safe altitudes within 25 nm of aerodromes are referred to as minimum sector altitudes.

16.4.4 *Use of flight guides.* An operator may use minimum safe altitudes and minimum sector altitudes given in a recognised Flight Guide, provided that the basis of the publisher’s calculations will give at least an equal standard to that required by this section. If necessary, corrections can be made and promulgated in the manual so that the

prescribed vertical separation is maintained.
16.5 **Corrections to Planned Minimum Safe Altitudes for Flights Over High Ground**
When the selected cruising altitude or flight level or one-engine-inoperative stabilising altitude is at or close to the calculated minimum safe altitude and the flight is within 20 nm of terrain having a maximum elevation exceeding 2000 feet, the previously calculated MSA must be increased as follows:

HEIGHT INCREASE FOR FLIGHT OVER HIGH GROUND
Windspeed in Knots
Elevation of terrain
0-30
31-50
51-70
Over 70
2000-8000 ft
500 ft
1000 ft
1500 ft
2000 ft
Above 8000 ft
1000 ft
1500 ft
2000 ft
2500 ft
NOTE: Relevant instructions must be included in the Operations Manual.
16.6 Manuals must include a reference to the effect of mountain waves on the maintenance of vertical separation and instruct commanders to take suitable precautions when such conditions are reported or forecast.
16.7 Adequate allowances to calculated minimum safe altitudes must be made when the ambient temperature on the surface is much lower than that predicted by the standard atmosphere. When the ambient temperature is lower than International Standard Atmosphere (ISA) -15°C, the following additions to minimum safe altitude must be made:
Lower than
ISA -15°C
Not less than 10%
" "
ISA -30°C
Not less than 20%
" "
ISA -50°C
Not less than 25%
16.8 For any route the maximum altitude obtainable with all power units operating, or the appropriate stabilising altitude with one-engine-inoperative, must be greater than the calculated minimum safe altitude for that route.
17
AERODROME OPERATING MINIMA (AOM) - TAKE OFF AND LANDING
17.1 Minima for airfields in regular use and associated alternates must be listed in the operations manual, for take-off, landing and visual manoeuvring. For airfields visited infrequently the minima may be listed in the commander's brief; a copy must be

retained for 6 months.
17.1.1 Operators' instructions on aerodrome operating minima are particularly important. They should be stated clearly for the benefit of flight crew members. The instructions and tables have two purposes:

(a)
to enable the commander to appreciate the operator's intentions and requirements; and

(b)
to decide whether to commence or continue an approach.

17.2 Minima for take-off and landing must be specified for each type of aircraft and for each runway and associated approach aid at each aerodrome. Take-off minima will vary with the performance group of the aircraft. Minimum values acceptable to the **CAD** are shown at Appendix B of this Chapter. Landing minima, and the method of calculation, are also shown at Appendix B. Landing minima can be calculated using different methods from those detailed in this Appendix, but such minima must be no lower than those derived from the Appendix. Operators of helicopters should consult their assigned Inspector.

17.3 It is the responsibility of operators to establish and specify appropriate minima. The **CAD** and its Inspectors cannot assume any responsibility for the minima specified and every instruction issued. The operator must designate a suitably qualified person to keep the instructions under review and amend, as necessary.

17.4 For normal operations (non-LVO) and for Take Off, operators are permitted to use the minimum RVR, as amended by NOTAM, or as published on the appropriate approach or aerodrome charts forming part of their operations manual, whichever is the higher. Subject to the **CAD's** acceptance, operator's obligation to publish AOM may be fulfilled by use of aerodrome and approach charts that have been published using Pans Ops, Terps or other State criteria.

17.5 Guidance on the calculation of landing minima for Category II and III operations is given in **CAD** 359.

17.6 Minima and associated instructions must be presented so that the information is readily available to and easily interpreted by the flight crew.

17.7 Only 'notified' or approved instrument approach procedures may be included in the tables. Runways or landing strips and approach aids which are not authorised for either take-off or landing must be specified either in the AOM tables or by a general instruction.

17.8 For the guidance of commanders, who may be obliged to take off from or land at aerodromes for which values have not been specified, operators must give data and instructions which allow for the calculation of minima. The data and instructions should be expressed as simply as possible and secure, as a minimum the normal operating standards observed by the operator. In these circumstances it may not be practicable for the commander to give the same detailed consideration to all the relevant factors as the operator. Therefore, the minima calculated in this way will usually be higher than those which would have been precalculated. When an aircraft commander calculates AOM in accordance with these criteria, the calculations must be retained with other flight documentation.

17.9 Operators must state that a commander is authorised to exercise discretion and apply minima higher than those prescribed by the operator, when it is necessary to secure the safety of the aircraft.

17.10 Minima for commanders with limited experience on type shall be established.

17.11 **Selection of Alternate Aerodromes**
17.11.1 Alternate aerodromes designated by the operator must be specified either in the manual or in the commander's flight brief. Instructions must be given on the factors to be taken into account by commanders in the selection of alternates for particular flights.
17.11.2 When the weather conditions are below landing minima at the departure aerodrome, take-off is prohibited unless a suitable return alternate is available within a specified time or distance, as set out below:

Number/type of engines	*Time/distance at one-engine-inoperative speed*
4 turbine	120 minutes or 500 nm) whichever
4 piston	90 minutes or 400 nm) is the less
3 turbine	90 minutes or 400 nm)
3 piston	60 minutes
2 turbine	60 minutes
2 piston	30 minutes
2 turbine (helicopters)	60 minutes

NOTE: For advice on limits for aircraft not included in the table the operator should consult their assigned Inspector.
17.11.3 At the flight planning stage, operators using Category II and Category III equipped aircraft must consider the possibility of a failure preventing this operation and ensure that the alternate chosen, has weather that is forecast to be at or above Category I limits.
17.12 **Take-off Minima**
17.12.1 Minimum conditions for take-off must be specified in terms of Runway Visual Range (RVR) and, where State Minima requires, cloud ceiling, and full account taken of all relevant factors. See paragraph 2.5 of Appendix B to this chapter for procedure when RVR is not reported. Factoring of meteorological visibility for take-off is not permitted.
17.12.2 Special rules applicable to certain types of aircraft are discussed in paragraph 17.16.
17.13 **Landing Minima**
17.13.1 *The Approach Ban.* A statement must be made setting out in what circumstances an approach may or may not be started or continued, based on the provisions of the AN(HK)O. The approach ban is applied to all intended approaches to land by a public transport aircraft. In effect, an aircraft making an approach to land may only descend below 1000 ft above the aerodrome elevation when the RVR, factored meteorological visibility or meteorological visibility reported for the intended runway or direction of landing is equal to or better than the minimum RVR or visibility specified for that runway or direction of landing, appropriate to the type of approach i.e. precision, non-precision or visual. The ban will apply even when the specified visual reference, as distinct from RVR, may have been achieved at or above 1000 ft above the aerodrome. Also an aircraft shall not continue an approach to land by flying below the relevant specified Decision Height/Altitude or the relevant specified Minimum Descent Height/Altitude, unless from that height/altitude the specified visual reference for

landing is established and is maintained.

17.13.2 *Decision Height/Altitude and Minimum Descent Height/Altitude.* A Decision Height/Altitude (DH/A) or a Minimum Descent Height/ Altitude (MDH/A) must be specified for each precision and non-precision instrument approach procedure respectively for each runway or landing strip used. In determining the appropriate height or altitude, account must be taken of all relevant factors. The method of calculation is described at Appendix B of this Chapter.

17.13.3 *Runway Visual Range (RVR).* Minimum values of RVR must be specified by the operator. For aerodromes and runways where RVR is not measured, operators must specify the minimum reported visibility below which an approach to land cannot be commenced or continued. The relationship between RVR and meteorological visibility is shown at Appendix B of this Chapter.

17.13.4 *Increments to minima.* These are to be applied to specified values of DH/A, MDH/A and RVR for commanders with only limited experience on the type of aircraft. Appropriate increments must also be applied when any unserviceability of instrumentation or systems significantly affects the performance and/or handling of the aircraft.

17.14 **Minima for Visual Landing**

17.14.1 RVR or equivalent RVR or meteorological visibility must be established for all types of approaches to any runway; these minima apply also to partial or complete visual circuit and cloud break procedures. Details are given at Appendix B of this Chapter.

17.14.2 Minima consisting of an MDH/A, flight visibility, RVR or equivalent and a visual reference are to be specified for an instrument approach procedure to be followed by visual manoeuvring (circling) for landing. These minima apply where a pilot uses a radio aid to position, to within sight of the aerodrome, and then makes a partial circuit or other significant manoeuvre to line up for the approach and landing, e.g. a change of track of more than 30°.

17.14.3 The minimum height for all forms of circling is determined by reference to the relevant chart or AIP, consistent with the handling and performance characteristics of the aircraft. Absolute minima are given at Appendix B of this Chapter.

17.14.4 At some aerodromes it is necessary to restrict circling to a particular segment of the circuit, e.g. north of the extended centreline only, because of major obstacles or high ground. Any such restriction must be clearly indicated in the lists of operating minima.

17.14.5 For a visual circuit after a visual approach or when manoeuvring after an instrument approach, visual contact must be maintained with the ground. This will allow the aircraft to be positioned in relation to the aerodrome and remain within any notified visual manoeuvring area. Exceptionally, if visual reference is lost when circling to land from an instrument approach, the missed approach specified for that particular procedure must be followed. An initial climbing turn will be made towards the landing runway and, when overhead the aerodrome, establish the aircraft climbing on the missed approach track. As the circling manoeuvre may be accomplished in more than one direction and depending when visual reference is lost, different patterns will be required to establish the aircraft on the prescribed missed approach course.

17.15 **Specification of Visual Reference**
17.15.1 For precision approaches, instructions must be given on the minimum visual reference required at Decision Height (DH) or Decision Altitude (DA) and thereafter. The visual reference segment must contain sufficient physical features so that the aircraft's position relative to the desired flight path can be identified. It must include an element for lateral control, e.g. a cross bar of the Calvert approach lighting system or barrettes on approach lighting systems, where there are no cross bars.
17.15.2 The specified visual segment of a full Category II or III approach should contain the appropriate number of runway or approach lights.
17.15.3 For approaches using other aids and, when approach lighting is not available, the specified visual reference must include the desired point of touchdown, the "aiming point", on the runway of intended landing. If approach lights are available, it is not essential that the aiming point is in view at the MDH/A but the segment of lighting specified must contain at least 7 lights, which may be approach lights or runway lights or a combination of both.
17.15.4 Specifying visual references in diagrammatic form is permitted, provided that the specifications meet the above criteria.
17.16 **Special Rules for Certain Aircraft**
Certain groups of aircraft are subject to special statutory provisions in respect of aerodrome operating minima (see Schedule 15 of AN(HK)O). These limitations should be taken into account in establishing minima, which should be marked where necessary for operations by day only. If the operator's limitations because of the effect of the Regulations - are based on a specially reduced take-off weight, this must be indicated clearly in the listed minima.
17.17 **Aerodromes Without Approach Aids**
A statement must be made in the operations manual that aeroplanes with a maximum total weight exceeding 5700 kg, engaged in the public transport of passengers, are prohibited from operating into and out of an aerodrome not equipped with radio and a radio navigation aid, either at the aerodrome or elsewhere, to assist in the location of and approach to the aerodrome. Operators wishing to develop an instrument approach procedure at an aerodrome without approved aids should contact their assigned Operations Inspector.
17.18 **State and Special Minima at Foreign Aerodromes**
17.18.1 Most foreign countries set mandatory operating minima which require compliance. In some instances, however, the authorities may permit the use of lower minima, on application by a Hong Kong operator and in consultation with the **CAD**.
17.18.2 It is the responsibility of the operator to make a fresh application for special minima following changes in aerodrome facilities or other factors.

17.19 **Heliport Operating Minima**
17.19.1 No approach to land under instrument flying conditions to any heliport when the visibility is below 800M should be carried out unless RVR information or other means of accurate information is available.

18
HELICOPTER OPERATIONS OVER WATER

Cancelled –refers to CAD 360 Helicopter Supplement

19

LOADING

19.1 **Loading Instructions**

In order to carry cargo in what would normally be the passenger cabin an approved modification is usually necessary, taking into account the airworthiness requirements for the particular type of aircraft and the flight manual limitations.

NOTE: The requirements to be satisfied in order to gain approval for the carriage of cargo in passenger compartments are given in **CAD** 360 Part 2 Chapter 4.

19.1.1 The approval reference number of the appropriate approved modification must be shown in the operations manual or, if the **CAD** has deemed that a modification is not necessary, the basis for the **CAD's** acceptance.

19.1.2 Where no approval/acceptance has been granted and shown in the manual, cargo must not be carried other than in designated cargo compartments.

19.1.3 Instructions must provide guidance for traffic staff, handling agents and aircraft crew, as appropriate, on the loading, weight and balance of an aircraft and include instructions on:

(a)
Controlling and promulgating the basic or Aircraft Prepared for Service (APS) weights and indices. Where used, all items of equipment that convert basic to APS weight must be listed;

(b)
regulating the carriage and stowage of baggage and cargo in passenger compartments, including instructions on the amount of hand baggage allowed and how it is to be stowed. Emergency exits, gangways and dinghy launching stations must be kept clear during taxying, take-off and landing;

(c)
carriage of Dangerous Goods;

(d)
limitations on floor loading, the strength and distribution of attachment points, use of weight spreading devices and positioning and securing of ballast;

(e)
checking that items of cargo or baggage allocated to particular compartments or holds are distributed and restrained correctly. The person responsible for the trim of the aircraft must give written instructions to the person responsible for loading the aircraft;

(f)
advising the aircraft commander and cabin crew of seating restrictions;

(g)
the effect of the maximum zero fuel weight, landing weight restrictions at planned destination, take off and climb performance requirements at the departure aerodrome and en route performance requirements on Regulated Take-Off Weight (RTOW);

(h)
the care and maintenance of Unit Load Devices (ULD), responsibilities for ensuring their fitness for use prior to loading and the procedure for directing damaged units to an approved organisation for repair;

(i)
fuel loading limitations;

(j)
where appropriate, limitations on loading for ferrying aircraft with one engine inoperative, Certificate of Airworthiness (C of A) tests or any other non-standard flight; and
(k)
where applicable, the use of the standard weights or any notional weights given in exemptions granted by the **CAD**.

19.2 **Cargo Loading Instructions**

These instructions must include the following additional details:
(a)
diagrams and dimensions of cabin bays and cargo holds and compartments to facilitate the pre-planning of cargo distribution;
(b)
the strength and usable directions of all lashing points and/ or rings and details of the spacing between lashing points;
(c)
the types and working strengths of lashing provided, and stowage, when not in use;
(d)
instructions concerning the loading of stretchers, carriage of livestock or other unusual loads;
(e)
where appropriate, the handling, loading and securing of pallets or containers;
(f)
a care and maintenance programme for ULDs; these include cargo containers, nets and pallets. Guidance must be given to both loading and maintenance personnel on the division of duties in respect of ULD serviceability;
(g)
instructions on the use of passenger aircraft for the carriage of cargo;
(h)
guidance on the duties and responsibilities of individuals when making cabin configuration changes. These changes require a Certificate of Release to Service (CRS). Further information on these procedures can be obtained from the Airworthiness Office;
(i)
where appropriate, instructions on the loading and securing of mail bags or similar cargo, including checking for leakage or spillage and consequential aircraft contamination; and
(j)
a statement that a load/trim sheet cannot serve as a loading instruction and a trim slide rule does not dispense with the requirement to complete a load sheet.

19.3 The position of the laden centre of gravity must be given on the load sheet. For this purpose, a trim sheet may be regarded as part of the load sheet, even though it can be a separate document. The complete document must include particulars of how the load is distributed and special attention paid to the wording of the loading certificate. This may be met by establishing that the Centre of Gravity (C of G) lies within the permitted limits and it is not necessary to determine the precise position, unless it affects aircraft handling or other factors. The load sheet must bear the reference of the APS form used and, if standard weights have been used, an endorsement to that effect.

19.4 Where a ‘loading plan’ method is used, the basic assumptions upon which the plan is formulated must be given and must specify C of G limits more stringent than those permissible under the C of A. It must also be stated that loading in accordance with the ‘plan’ ensures that the laden C of G always falls within the restricted limits. If this is done, a simple statement on the load sheet that the laden C of G is between the operator’s more stringent limits is acceptable.

19.5 Operators must provide traffic staff and handling agents, including agents at overseas aerodromes, with:

(a)
loading instructions, including the principles of effective cargo restraint;

(b)
current APS forms for all types, marks and variants of aircraft used; and

(c)
details of the RTOW and fuel load for each flight.

19.6 Where traffic staff and handling agents are responsible for calculating the RTOW, operators must ensure that they are provided with all relevant information and are competent.

19.7 **Loadsheet Contents**

19.7.1 The load sheet, together with the APS form, must account for all items of the laden weight. Although they may not always be specified individually, the following are examples of items to be included:

(a)
Fuel, water methanol, oil, hydraulic fluid, drinking water, toilet water, de-icing fluid;

(b)
passenger seats, children’s cots, cabin floor covering, removable bulkheads;

(c)
galley equipment including urns, hot cups;

(d)
food and beverages to be consumed in flight;

(e)
bar stocks including the weight of the boxes or other containers;

(f)
navigation bag or aircraft library and navigation equipment, unless these items are included in the APS weight;

(g)
passengers’ hold baggage;

(h)
passengers’ cabin baggage, unless this is accounted for elsewhere;

(i)
flight spares and tools, spare hydraulic or de-icing fluid;

(j)
cargo;

(k)
aircraft crew baggage;

(l)
dinghies, all life-jackets flotation cots, survival packs, blankets, pillows and similar equipment;

(m) load spreading devices, lashing, ballast;

(n)
all items of removable equipment and removable radios carried; and
(o)
when livestock is carried, food and necessary equipment.
19.8 Loadsheets must show whether actual, standard, or approved notional weights of passengers and their baggage are used.
19.9 **Helicopter Loading**
Cancelled – refers to CAD 360 Helicopter Supplement
20
DANGEROUS GOODS, WEAPONS AND MUNITIONS OF WAR
20.1 **Carriage of Dangerous Goods**
20.1.1 The Air Navigation (Dangerous Goods) Regulations set out the applicable requirements, including those relating to operators' responsibilities. They require that a written permission be issued by the **CAD** before the operators are authorized to carry dangerous goods (DG) and such goods are carried in accordance with the International Civil Aviation Organisation (ICAO) Technical Instructions for the Safe Transport of Dangerous Goods by Air (Doc 9284).
20.1.2 Such DG Permission is granted by the **CAD** Dangerous Goods Office when the **CAD** is satisfied as to the adequacy of staff training and procedures. Following the grant of DG Permission, the operator should also check their AOC to see if an AOC variation is required and contact the **CAD** Flight Standards and Airworthiness Office where needed.
20.1.3 Detailed requirements of crew and staff training and procedures can be found in Appendix 2 to ICAO Annex 6, Schedule 16 to AN(HK)O, Annex 18, Doc 9284 and Emergency Response Guidance for Aircraft Incidents Involving Dangerous Goods (Doc 9481) [Remarks: The latter four are comprehensive requirements for the safe transportation of DG for all relevant personnel, e.g. staff of operators, shippers, and are being enforced by **CAD** Dangerous Goods Office].
20.1.4 Certain items described generally as DG do not require a Permission for carriage. These include aircraft equipment and stores, certain items carried by passengers or crew and items required for use in flight to provide veterinary aid to an animal or medical aid to a person. Guidance must be given on what items can be carried in all these circumstances.

20.1.5 Operations manuals must state whether or not a Permission for the carriage of DG is held.
20.1.6 Where a Permission is not held, DG information and instructions in accordance with Schedule 11 to AN(HK)O and Appendix 2 to ICAO Annex 6 must still be included in the operations manual. Other relevant staff training and procedures applicable to these operators not authorized to carry DG (such as procedures to prevent the inadvertent carriage of undeclared DG on board aircraft specified under ICAO Doc 9284 or emergency procedures specified under Doc 9481) must be included in the appropriate manuals.
20.1.7 Where a Permission for the carriage of DG is held, DG information must be given to enable operator's staff or the ground handling agent to carry out their responsibilities. The instructions apply from the time DG are accepted for carriage until they cease to be in the care of the operator or ground handling agent. Operators and their handling agents are expected to observe other relevant DG storage requirements as stipulated by the Fire Services Department in Hong Kong or other competent authorities at outstations. The general guidelines on DG storage in Hong Kong are in Appendix F to

this chapter.
20.1.8 Accidents and incidents arising from the carriage of dangerous goods are reportable under the Mandatory Occurrence Reporting Scheme (see paragraph 24).
20.1.9 Detailed DG requirements are stipulated in Schedule 16 to the AN(HK)O, ICAO Doc 9284 and ICAO Doc 9481. Please contact the **CAD** Dangerous Goods Office for further advice.
20.2 **Carriage of Weapons and Munitions of War (MUW)**
20.2.1 Munitions of war shall only be carried with the written permission of the **CAD**. Munitions of war are any weapon, ammunition or article containing an explosive or noxious liquid, gas or other thing which is designed or made for use in warfare or against persons, including parts, whether components or accessories, for such weapon, ammunition or article. In Hong Kong, MUW on board aircraft are mostly arms and ammunition for law enforcement, sporting and filming use.
20.2.2 Accidents and incidents arising from the carriage of weapons and munitions of war are reportable under the Mandatory Occurrence Reporting Scheme (see paragraph 24).
21
CARRIAGE OF ANIMALS
21.1 **General**
21.1.1 Operators who intend to carry animals must hold a current edition of the International Air Transport Association (IATA) Live Animals Regulations. The Regulations give guidance on such matters as the types of containers that should be used, labelling and marking of containers, animal health and hygiene, feeding, loading and sedation.

21.2 **Livestock, Horses and Other Large Animals**
21.2.1 Where livestock or other large animals are carried, the information must be given on action in emergencies, as well as the carriage and use of animal first aid and emergency kits, including the use of the captive bolt humane killer.
21.2.2 The determination of the weight of the consignment and where this weight is recorded on the load-sheet must be given. Guidance on loading should include:
(a)
the weight, dimensions, construction, method of attachment and required restraint for horse boxes or animal pens;
(b)
the checks necessary, before loading horse boxes or animal pens, on the general condition and serviceability of fitting and lashing points;
(c)
the loading of horse boxes and the tethering of horses;
(d)
the stowage of loose equipment such as food and water containers and horse paraphernalia; and
(e)
the number and type of food and water containers and the quantities of food and water required, based on the duration of the flight and the number of animals carried.
21.2.3 Instructions must be given on checking an aircraft after a flight on which livestock, horses or other large animals have been carried for damage to the structure, fittings, wiring etc and for any adverse effects resulting from high humidity and urination.
21.2.4 When horses are carried, the minimum number of grooms for particular loading configurations must be specified.
22

GROUND HANDLING AND AIRCRAFT DISPATCH

22.1 Operators are responsible for the safe dispatch of their aircraft following cargo and passenger loading, refuelling, cleaning, catering and the completion of preflight maintenance and servicing. Any damage to the aircraft must be reported and assessed for airworthiness significance prior to flight.

22.2 Instructions must be given to ensure that dispatch tasks are carried out in a standard manner, that each task is fully and correctly completed, and that any damage is reported immediately.

22.3 Instructions on training requirements, subcontracting policies, handling processes, procedures and practices for all ground handling operations should be developed in the form of a Ground / Aircraft Handling Manual.

22.4 Where dispatch tasks are contracted out to other organisations, contracts must include the operator's requirements for safe conduct of the task and the performance of the contractor, in respect of safety, must be monitored regularly. Even when all or part of the functions and tasks have been contracted to contractor, operators' ground handling responsibility must be permanently maintained.

23

ACCIDENT PREVENTION AND FLIGHT SAFETY

23.1 Operators are to establish and maintain accident prevention and flight safety programmes under the supervision of a person specifically nominated for the purpose. Operators should refer to **CAD** 739, which contains information and guidance on Flight Data Analysis Programmes.

Note: Guidance on accident prevention is also contained in ICAO Doc 9422 - 'Accident Prevention Manual'.

24

ACCIDENT REPORTING

24.1 Provision must be made for all operating staff to have ready access to the prescribed requirements for the reporting and investigation of accidents. In particular, operating staff should be familiar with the definitions used in the legislation, the duty to furnish information, and the rules governing the removal of damaged aircraft.

24.2 Instructions must be issued on the reporting of accidents occurring overseas to the regulating authority of the country concerned and the action necessary to prevent removal or interference with any part of the aircraft without proper permission. This is in addition to operators' existing responsibility to inform the Chief Inspector of Accidents, Civil Aviation Department. The operations manual should contain the address and telephone numbers of the Department.

24.3 If doubt exists on whether an occurrence is an accident or an incident, it should be reported to the Department who will decide on its classification.

24.4 An operator shall ensure, to the extent possible, in the event the aircraft becomes involved in an accident or incident, the preservation of all related flight recorder records and, if necessary, the associated flight recorders, and their retention in safe custody pending their disposition as determined in accordance with Hong Kong Civil Aviation (Investigation of Accidents) Regulations. Flight recorder means flight data recorder and/or cockpit voice recorder, where applicable.

24.5 To preserve flight recorder records, flight recorders shall be de-activated upon completion of flight time following an accident or incident. The flight recorders shall not be re-activated before their disposition as determined by the Inspector of Accidents in accordance with Hong Kong Civil Aviation (Investigation of Accidents) Regulations. Flight recorder means flight data recorder and/or cockpit voice recorder,

where applicable.
24.6 Documentation concerning parameter allocation, conversion equations, periodic calibration and other serviceability/maintenance information of the flight data recorder should be maintained by the operator. The documentation must be sufficient to ensure that accident investigation authorities have the necessary information to read the data in engineering units.

25
OCCURRENCE REPORTING

25.1 Operators and commanders of Hong Kong registered public transport aircraft shall submit to the **CAD** without delay, a report of any act of unlawful interference or any other occurrence which may endanger or, unless corrected, would have endangered an aircraft. Types of occurrence which must be reported are prescribed in the Air Navigation (General) Regulations.
25.2 Operations manuals must specify the persons responsible for raising occurrence reports and give such guidance as will enable them to comply with the statutory requirements.
25.3 Operators of aircraft that do not fall within the MOR scheme should include instructions in the manuals on the procedure for the reporting of incidents.
25.4 Any accident notified in pursuance of the Hong Kong Civil Aviation (Investigation of Accidents) Regulations shall not constitute a reportable occurrence for the purpose of Mandatory Occurrence Reporting.
25.5 Operators must give guidance on the submission of Mandatory Occurrence Reports (MORs) relating to Extended Range Twin Operations (ETOPS) aircraft. Any occurrence report on aircraft types subject to ETOPS approval, must be prominently annotated 'ETOPS'.

26
LOW VISIBILITY OPERATIONS (LVO)

26.1 Operators wishing to operate to Categories II or III limits are to submit their proposed procedures to **CAD** for acceptance, prior to including such procedures in their operations manual. HKCAD requirements for LVO are contained in **CAD** 359.

27
EXTENDED RANGE TWIN-ENGINED OPERATIONS (ETOPS)

27.1 Operators wishing to operate twin-engined aircraft for more than 60 minutes from an alternate airport and which are not limited by the certificate of airworthiness to the carriage of less than 20 passengers (ANHKO Schedule 15 regulation 4(5)), are to submit their proposed procedures to **CAD** prior to including such procedures in their operations manual, in order that permission may be granted. HKCAD requirements for ETOPS are contained in **CAD** 513 for extended operations up to 180 minutes. Any extension beyond 180 minutes will be considered by HKCAD and subject to operator's compliance with information contained in FAA Advisory Circular No. 120-42B.

28
EXTENDED RANGE TWIN-ENGINED OPERATIONS – (NON-ETOPS)

28.1 Operators wishing to operate twin-engined aircraft for more than 90 minutes flying time in still air at the all power units economical cruising speed from a suitable en-route alternate aerodrome and which are limited by the certificate of airworthiness to the carriage of less than 20 passengers, are to submit their proposed procedures together with a safety assessment of the aircraft one engine inoperative capability to **CAD**, requesting an exemption to the ANHKO Schedule 15 regulation 4(5).

29

MIXED FLEET FLYING (MFF)

29.1 Operators wishing to conduct MFF are to submit their proposed procedures for MFF training and MFF operations to **CAD** for approval, prior to including such procedures in their operations manual. **CAD** guidelines for MFF are outlined at Appendix G.

30

COMMUNICATION AND NAVIGATION EQUIPMENT

30.1 Communication Equipment

30.1.1 An aeroplane or a helicopter shall be provided with radio communication equipment capable of:

(a) conducting two-way communication for aerodrome control purposes;

(b) receiving meteorological information at any time during flight; and

(c) conducting two-way communication at any time during flight with at least one aeronautical station and with such other aeronautical stations and on which frequencies as may be prescribed by the appropriate authority.

30.1.2 The radio communication equipment required in accordance with the above paragraph shall provide for communications on the aeronautical emergency frequency 121.5 MHz.

30.1.3 **[Paragraph reserved for Required Communication Performance (RCP)]**

Note: In accordance with Article 14 of AN(HK)O, the aircraft shall be equipped with radio and radio navigation equipment required by Schedule 6 of AN(HK)O and the equipments installed in aircraft shall be approved by the **CAD**.

30.2 Navigation Equipment

30.2.1 An aeroplane or a helicopter shall be provided with navigation equipment which enable it to proceed:

(a) in accordance with its operational flight plan; and

(b) in accordance with the requirements of air traffic services.

Except when, if not so precluded by the appropriate authority, navigation for flights under the visual flight rules is accomplished by visual reference to landmarks.

Note: In accordance with Article 18(4) of AN(HK)O, an aircraft for public transport shall carry navigational equipment approved by the **CAD** when operating to areas specified in Schedule 8 of AN(HK)O. Also, in accordance with Article 14 of AN(HK)O, the aircraft shall be equipped with radio and radio navigation equipment required by Schedule 6 of AN(HK)O and the equipments installed in aircraft shall be approved by the **CAD**.

30.2.2 For operations where a navigation specification for performance-based navigation (PBN) (i.e. required navigation performance (RNP) or area navigation (RNAV))

specification has been prescribed, an aeroplane or a helicopter shall:
(a)
be provided with navigation equipment which will enable it to operate in accordance with the prescribed navigation specifications; and
(b)
be approved by the **CAD** for operations in such airspace in accordance with Article 36A of AN(HK)O.
Note: All operators requiring PBN approval shall apply to the **CAD** using the appropriate DCA Form (e.g. DCA 4046 to DCA 4047) which could be downloaded
from
CAD
website
http://www.**cad**.gov.hk/english/applications.html/, and refer to the guidance on implementation and operational approval in the ICAO Performance-based Navigation Manual (Doc 9613).
30.2.3 For flights in defined portions of airspace where, based on Regional Air Navigation Agreement, minimum navigation performance specification (MNPS) are prescribed, an aeroplane shall be provided with navigation equipment which:
(a)
continuously provides indications to the flight crew of adherence to or departure from track to the required degree of accuracy at any point along that track; and
(b)
has been approved by the **CAD** for MNPS operations concerned in accordance with Article 36 of AN(HK)O for all aircraft operating through the MNPS airspace as prescribed in Schedule 15 of AN(HK)O.
Note: The prescribed MNPS and the procedures governing their application are published in the Regional Supplementary Procedures (Doc 7030) and those for the North Atlantic MNPS Airspace are in the current edition of the "Guidance concerning Air Navigation and above the North Atlantic MNPS Airspace" (NAT 007) (see an example of MNPS airspace in North Atlantic map in Chap 4 Appendix A).

31

REDUCED VERTICAL SEPARATION MINIMA (RVSM) OPERATIONS

31.1 Operators wishing to operate in RVSM airspace are required to submit their proposed procedures to **CAD** for acceptance, prior to including such procedures in their operations manual. Guidance material may be found in ICAO Doc. 7030, Regional Supplementary Procedures and ICAO Doc. 9574, Manual on Implementation of a 300 M (1000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive. All operators requiring RVSM approval shall apply to **CAD** using Form DCA4040 which is available in **CAD** FSAD Office.

31.2 For flights in RVSM airspace, an aircraft shall be provided with equipment which is capable of:
(a)
indicating to the flight crew the flight level being flown;
(b)
automatically maintaining a selected flight level;
(c)

providing an alert to the flight crew when a deviation occurs from the selected
flight level. The threshold for the alert shall not exceed ±90 m (300 ft);
(d)
automatically reporting pressure-altitude; and
(e)
the aircraft shall demonstrate a vertical navigation performance in accordance
with ICAO Annex 6 Part 1 Appendix 4.
31.3 The criteria for granting the RVSM approval are:
(a)
the vertical navigation performance capability of the aeroplane satisfies the
requirements specified in ICAO Annex 6 Part I Appendix 4;
(b)
the operator has instituted appropriate procedures in respect of continuing
airworthiness (maintenance and repair) practices and programmes (Reference
can be made to the document mentioned in the note below); and
(c)
the operator has instituted appropriate flight crew procedures for operations in
RVSM airspace (Reference can be made to the document mentioned in the note
below).
Note: JAA Administrative & Guidance Material, Section One: General Part 3:
Temporary Guidance Leaflet No. 6 is used as the reference acceptance criteria
for granting the RVSM approval.
31.4 An operator with a RVSM approval must make arrangement to monitor the
height-keeping performance of their aircraft on an on-going basis. As a minimum, the
operator shall monitor the height-keeping performance of two aeroplanes of each
aircraft type grouping at least once every two years or within intervals of 1,000 flight
hours per aeroplane, whichever period is longer. If an operator aircraft type grouping
consists of a single aeroplane, monitoring of that aeroplane shall be accomplished
within the specified period of 2 years. The operator should establish a monitoring
schedule for different aircraft group and provide **CAD** with the monitoring data and
monitoring methodology on an annual basis or when required.
Note: Monitoring data from any regional monitoring agencies established in
accordance with Annex 11, 3.3.5.2 may be used to satisfy the requirement.
31.5 Additional airworthiness requirements can be found in the Airworthiness Notice
(http://www.**cad**.gov.hk/english/HKAN.html).

32
COSMIC RADIATION

32.1 Operators of public transport aircraft registered in Hong Kong shall, in respect of any
flight by that aircraft during which it may fly at an altitude in excess of 26,000 ft, keep a
record of the total dose of cosmic radiation to which the crew are exposed together with
the names of that crew. The crew has the meaning assigned to it by Article 98 paragraph
(4) of the Air Navigation (Hong Kong) Order 1995.
32.2 Where the record (e.g. CARI-6 computer programme) indicates that a crewmember may
achieve exposure of more than 4mSv in any 12 calendar month period, then that
crewmember should be rostered accordingly to ensure that his/her annual exposure does
not exceed 6mSv.
32.3 For flights intended to be operated above 49,000 ft, operators, as defined in paragraph
32.1 above, are required to:
(a)

apply to **CAD** for an exemption from Scale W of Schedule 5 of the Air Navigation (Hong Kong) Order 1995;

(b)

provide information which will enable the pilot to determine the best course of action to take in the event of exposure to solar cosmic radiation; and

(c)

develop procedures in the event that a decision to descend is taken, covering:

-

the necessity of giving the appropriate ATS unit, prior warning of the situation and of obtaining a provisional decent clearance;

-

the action to be taken in the event that communication with the ATS unit cannot be established or is interrupted.

32.4 **CAD** Operations Inspectors will review cosmic radiation records when conducting AOC inspections.

33

INTERCEPTION PROCEDURE

In accordance with the AN(HK)O Schedule 12, a copy of the following notified procedures must be carried on board the aircraft:

(a)

Procedures to be followed by the pilot in command of an intercepted aircraft; and

(b)

notified visual signals for use by intercepting and intercepted aircraft.

For instance, these are available in reference publications such as the Hong Kong Aeronautical Information Publication (AIP) and the Aerad Flight Guide Supplement.

34

ELECTRONIC FLIGHT BAG (EFB) OPERATIONS

34.1 Traditionally all documentation and information available to flight crew for use on the flight deck have been in paper format. Much of this information is now available in electronic format. Operators wishing to operate EFB are to submit their proposed procedures to the **CAD** for acceptance, prior to including such procedures in their operations manual.

34.2 The assessment to the application of EFB Operational Approval is based on JAA Administrative & Guidance Material, Section Four Part Three, Temporary Guidance Leaflet (TGL) No. 36. All operators requiring EFB approval shall apply to the **CAD** using Form DCA4041 which is available in **CAD** FSAD Office.

35

HEAD-UP DISPLAYS (HUD) AND ENHANCED VISION SYSTEMS (EVS) OPERATIONS

35.1 Under ICAO Annex 6 Part I, EVS means a system to display electronic real-time images of the external scene achieved through the use of image sensors, whereas HUD means a display system that presents flight information into the pilot's forward field of view.

35.2 When aeroplanes or helicopters are equipped with HUD and/or EVS, operators shall include the instructions and training requirements for the use of HUD and EVS equipment in the operations and/or training manuals where applicable.

35.3 When operators wish to use HUD and/or EVS to gain operational benefit, such as operating in visibilities lower than the normal aerodrome operating minima or heliport operating minima (i.e. lower minima for approach and landing operations), approval must be obtained from **CAD** in writing prior to the use of such systems. To support such approval, the instructions and training requirements, and also the instructions for determining the aerodrome operating minima or heliport operating minima for instrument approaches using HUD and EVS shall be included in the operations and/or training manuals.

Note: Guidance on HUD and EVS is contained in ICAO Annex 6 Part I Attachment J.

36

AUTOMATIC DEPENDENT SURVEILLANCE BROADCAST (ADS-B) OUT OPERATIONS

36.1 ICAO's Asia-Pacific Regional Group has decided to use the 1090MHz (Mode S) Extended Squitter datalink as the globally interoperable link for ADS-B operations. ICAO has also issued a number of technical and operational standards to support its introduction.

36.2 Operators wishing to operate in ADS-B airspace are to submit their proposed procedures to **CAD** for acceptance, prior to including such procedures in their operations manual. All operators requiring ADS-B approval shall apply to the **CAD** using Form DCA4042 which could be downloaded from **CAD** website at http://www.**cad**.gov.hk/english/applications.html.

36.3 For flights in ADS-B airspace, an aircraft shall be equipped with either:

(a)
The ADS-B equipages that have been certificated as meeting EASA Acceptable Means of Compliance AMC 20-24 'Certification Considerations for Enhanced ATS in Non-Radar Areas using ADS-B Surveillance (ADS-B-NRA) via 1090 MHZ Extended Squitter', or

(b)
The ADS-B equipages that meet the equipment configuration standards of Australia Civil Aviation Order 20.18 Appendix XI.

36.4 The criteria for granting the ADS-B approval are:

(a)
The continuing airworthiness of ADS-B system must be assured. As part of the operational approval process, existing established maintenance practices or a proposed maintenance programme for the aircraft needs to be reviewed to ensure that it meets relevant requirements;

(b)
The Minimum Equipment List needs to reflect the functional requirements of the ADS-B system;

(c)
Appropriate flight operations training programme and operational procedures are established to ensure that pilots are knowledgeable about ADS-B operations and their onboard operational equipment.

Note: EASA Acceptable Means of Compliance AMC 20-24 is used as the reference acceptance criteria for granting the ADS-B approval.

37

OPERATING FACILITIES

37.1 An operator shall ensure that a flight will not be commenced unless it has been ascertained by every reasonable means available that the ground and/or water facilities available and directly required on such flight, for the safe operation of aircraft and the protection of the passengers, are adequate for the type of operation under which the

flight is to be conducted and are adequately operated for this purpose. The relevant provisions for compliance by operators are in the AN(HK)O.
37.2 An operator shall ensure that any inadequacy of facilities observed in the course of operations is reported to the authority responsible for them, without undue delay.
37.3 An operator shall, as part of its safety management system, assess the level of rescue and fire fighting service (RFFS) protection available at any aerodrome intended to be specified in the operational flight plan in order to ensure that an acceptable level of protection is available for the aeroplane intended to be used.
37.4 Information related to the level of RFFS protection that is deemed acceptable by the operator shall be contained in the operations manual after acceptance by the **CAD**.
NOTE: Appendix C of this chapter reproduced ICAO Annex 6 Part I Attachment K which contains guidance on assessing an acceptable level of RFFS protection at aerodromes.

CHAPTER 4 APPENDIX A - NORTH ATLANTIC MNPS AIRSPACE

NOTE: The boundaries shown were **for reference only** and correct at the time of publication in November 2000 (Amdt 9), but operators must confirm the current co-ordinates of MNPS and Schedule 8 areas specified in AN(HK)O 1995.

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CHAPTER 4 APPENDIX B - AERODROME OPERATING MINIMA CALCULATIONS

1 DEFINITIONS

1.1 'Notified' for the purposes of this Appendix means set forth in a document entitled 'Aeronautical Information Publication' or 'NOTAM', published by the Civil Aviation Department or by any other civil aviation authority and for the time being in force. 'Specified' means specified by the operator in the operations manual.

1.2 The meaning of the expressions Decision Height, Minimum Descent Height,

Precision Approach and non-Precision Approach, are as defined in the ANO.
Missed Approach Point (MAP) is defined by ICAO as 'that point in an instrument approach procedure at or before which the prescribed missed approach procedure must be initiated in order to ensure that the minimum obstacle clearance is not infringed'.

2

TAKE OFF MINIMA - AEROPLANES IN PERFORMANCE GROUPS A, B, C, E, F AND X

2.1

This paragraph is designed to assist operators in the preparation of Take-Off Minima (TOM) for inclusion in operations manuals.

2.2

Each airfield and runway on that airfield that is used regularly for take-offs should be allocated TOM which take into account the Performance Group of the aeroplane and the runway lighting and markings available. Where an airfield is little used, operators should either issue TOM for that airfield or provide the aeroplane commander with guidance on how to calculate the minima. TOM that are not published in the manuals should be retained with the aeroplane documentation for a period of 3 months subsequent to the flight.

2.3

The figures published in the Table are considered the minimum to which aeroplanes can operate with a reasonable degree of safety. Operators may calculate the TOM for their aeroplane by whatever means they wish, but the figures arrived at should not be less than those listed, except when provided for in Notes 1, 2 and 3 below. The values given for aeroplanes in Groups C, E and F assume that sufficient runway remains for an immediate re-land ahead prior to the engine inoperative net flight path or en-route climb configuration and speed being achieved, or that no obstacles are in the take-off direction of the aeroplane.

TAKE-OFF MINIMA

Airworthiness
Performance
Group
Performance
Groups 'A' 'B' and
'X'
Performance
Group 'C'
See Note 1
Performance
Groups 'E' and 'F'
See Note 4
Rwy lighting and
marking available
CC/RVR
(feet/metres)
CC/RVR
(feet/metres)
CC/RVR
(feet/metres)

High intensity centre
line lighting
0/150
See Note (7)
200/500
See Note (2)
300/500
See Note (3)
High intensity edge
lighting and rwy centre
line marking
0/200
200/500
See Note (2)
300/500
See Note (3)
High intensity edge
lighting (day/night)
Low intensity edge
lighting (night only)
and no centre line
marking
0/300
200/500
300/600
Rwy centre line
marking with or
without low intensity
edge lighting (day)
0/350
200/600
300/800
No lighting or marking
(day), low intensity
edge lighting and no
rwy centre line marking
(day)
0/500
200/1000
300/1000

NOTES (1) Aeroplanes which have data in the Flight Manual that allows the engine-inoperative net flight path to be constructed from 100 ft or which have flaps up take-off data scheduled in the Flight Manual, may reduce the cloud ceiling (cc) minimum to 100 ft, with the approval of the Assigned Inspector.

(2) In circumstances when the emergency distance available is greater than twice the take-off distance required as specified in accordance with AN(HK)O Schedule 15, the minima may be reduced to 300 metres RVR and, when reported, 100 ft cloud ceiling.

(3) In circumstances when the emergency distance available is greater than twice the take-off distance required as specified in accordance with AN(HK)O Schedule 15, the minima may be reduced to 400 metres RVR and, when reported, 200 ft cloud ceiling.

(4) These minima are only valid for multi-engined aeroplanes which can achieve a one-engine-inoperative en route climb of at least 150 feet per minute (fpm); otherwise the take-off limit applicable to single-engined public transport operations of 1000 ft cloud ceiling and 1800 m visibility will apply.

(5) Commanders of aeroplanes in Groups C, E, F and X with less than 50 hours on type must increase any quoted minima by 100 ft and 200 metres.

(6) Minima for aeroplanes having no performance group classification shall be agreed on an individual basis with the Authority.

(7) Reductions below a take-off minima of 150 metres RVR may be authorised for some aircraft.

2.4
Experience has indicated that it is unlikely that sufficient runway will be available for a successful landing straight ahead unless the Emergency Distance Available (EDA) is at least twice the Take-Off Distance Required (TODR) from the start of the take-off roll.

2.5
When the RVR is not reported, aeroplane commanders should assess the apparent RVR by noting the number of runway lights visible from the aircraft providing the relevant light spacing is known. This procedure is only to be used for the purposes of RVR assessment for take-off and in conditions when the assessment is greater than 150 metres.

3 AIRCRAFT CATEGORIES AND OBSTACLE CLEARANCE HEIGHTS/ALTITUDE

3.1
The OCH/A is calculated, in part, relative to an Aircraft Category which is defined as follows:

AIRCRAFT CATEGORIES

Aircraft Category	*Nominal Speed at Threshold V_{AT} or V_{REF} (kts)*
A	Less than 91
B	91 - 120
C	121 - 140
D	141 - 165
E	166 - 210

3.2

The nominal V_{AT}, which is calculated by multiplying the indicated stalling speed in the approach configuration at maximum certificated landing weight by 1.3, is taken to be a fixed value for categorisation purposes. Therefore there is no need to consider changing the category should it be necessary to change the actual V_{AT} for a particular approach. For this purpose all helicopters fall into Category A.

4

DECISION HEIGHT, PRECISION APPROACHES

4.1

Minimum decision heights for approaches using Precision Approach Radar (PAR), Microwave Landing System (MLS) or Instrument Landing System (ILS) with in-line localiser and a glide slope between 2.5° and 3.5° should be determined by selecting the published OCH for the category of aircraft and comparing it with the system minimum given at paragraph 9 to this Chapter. The higher of these two values should then be taken and the position error correction applied before entering the value in the manual.

4.2

Before specifying decision heights based on the use of radio/radar altimeters, operators should consult their assigned Operations Inspector.

4.3

Precision approach OCH includes an aircraft height loss allowance to cover the initiation of a missed approach.

4.4

Operators should note and action as necessary that a special (increased) Category D OCH will be given for certain Instrument Approach Procedures (IAPs) for aeroplanes with greater than the standard dimensions used for the calculation of OCH. The standard dimensions are a semi-span of 31 metres and a vertical distance of 6 metres between the flight paths of the lowest part of the wheels and the glide path antenna, when the aircraft is in the final approach attitude.

4.5

With offset localisers, the specified OCH/A should not be less than the height/altitude on the nominal glide path at which the localiser intersects the runway extended centreline, plus 20m (66 ft). See ICAO Procedures for Air Navigation Services - Aircraft Operations, Volume 11 (PANS-OPS), Chapter 23.

5

MINIMUM DESCENT HEIGHT (MDH), NON-PRECISION APPROACHES

5.1

For approaches using an aid other than full ILS, MLS, or PAR, the MDH should not be less than the published OCH for the Category of the aircraft or the system minimum, whichever is the higher. In this case there is normally no need to apply a Position Error Correction (PEC) since this OCH includes an altimeter correction allowance of 50 ft. When however, the PEC is greater than 50 ft, the difference between this value and the Flight Manual figure will need to be added to the published OCH.

5.2

It must be noted that the aircraft is assumed to be in level flight when it arrives at the Missed Approach Point (MAP) for the calculation of obstacle clearance in the missed approach area. The implications of not being in level flight on the initiation of a missed approach are clear.

5.3

The ILS glide-path-inoperative procedure is non-precision but occasionally it will be found that the decision height for full ILS derived in accordance with paragraph

4.1 will be higher than the MDH for the glide path inoperative procedure. In such a situation, the lower MDH for the non-precision procedure must not be used as the decision height for the full ILS procedure.

6

VISUAL MANOEUVRING

6.1

The visual circuit height or the visual manoeuvring (circling) OCH specified for visual manoeuvring after an instrument approach and associated visibility, should never be less than the values tabulated below:

A/C Category	*Min Circling Height*	*In-Flt Circling Min. Vis (km)*
A	400 ft	1.9
B	500 ft	2.8
C	600 ft	3.7
D	700 ft	4.6

NOTE: These values are only valid within the visual manoeuvring area calculated in accordance with ICAO Procedures for Air Navigation Services - Aircraft Operations (PANS OPS).

6.2

The value of the RVR for a visual approach should be 800 metres or the lowest non-precision IAP RVR for the runway of intended landing when this is listed, whichever is the greater, regardless of approach lighting, time of day, or type of aircraft.

7

DETERMINATION OF MINIMUM RUNWAY VISUAL RANGE (RVR)

The minimum RVR to be associated with decision/minimum descent height can be determined from Table 1 or 2.

TABLE 1

PRECISION APPROACH TABLES

Minimum RVR for all aeroplane categories

Approach lighting length (metres)
and type (key below)

DH (feet)
LA
LB
LC
LD
200-250

600 (note 1)
700
800
900
251-300
650
800
900
1000
301-350
700
900
1000
1100
351-400
750
1000
1100
1200
401-450
800
1100
1200
1300
451-500
900
1200
1300
1400
501-550
1000
1300
1400
1500
551-600
1100
1400
1500
1500
601-650
1200
1500
1500
1500
651-700
1300
1500
1500
1500
Over 700
1500
1500
1500
1500
NOTES:
(1)
If runway centre line, touchdown zone and threshold lighting

is in use, an RVR of 550m is permitted when the DH is 200 ft.

(2)

Table 1 is only applicable to conventional approaches in the order of a 3° glide slope. Greater glide slope angles will usually require that visual glide slope guidance (e.g. PAPI) is also visible at DH.

LA: 720m or more High Intensity (HI)

At least 4 X-bars with coded CL or 1 X-bar with centreline barrettes

LB: 400m to 719m HI

At least 1 X-bar with coded CL or centreline barrettes

LC: Up to 399m HI

At least 1 X-bar or centreline barrettes

LD: No approach lighting or for any system not meeting the above specifications

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TABLE 2

NON-PRECISION APPROACH TABLES

Minimum RVR for all aeroplane categories

Approach lighting length (metres)
and type (key below)

MDH (feet)	LA	LB	LC	LD
250	650	800	900	1000
251-300	700	900	1000	1100
301-350	800	1000	1100	1200
351-400	900	1100	1200	1300
401-450	1000	1200	1300	1400
451-500				

1100
1300
1400
1500
501-550
1200
1400
1500
1500
551-600
1300
1500
1500
1500
601-650
1400
1500
1500
1500
651-700
1500
1500
1500
1500
Over 700
1500
1500
1500
1500
LA: 720m or more High Intensity (HI)
At least 4 X-bars with coded CL or 1 X-bar with centreline barrettes
LB: 400m to 719m HI
At least 1 X-bar with coded CL or centreline barrettes
LC: Up to 399m HI
At least 1 X-bar or centreline barrettes
LD: No approach lighting or for any system not meeting the above specifications

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8
CONVERSION OF REPORTED METEROLOGICAL VISIBILITY TO RVR

Table 3 provides factors that should be applied when converting meteorological visibility to equivalent RVR.

Lighting Elements Available
RVR = Reported Met
Visibility x
Day
Night
High Intensity Approach and Runway Lighting
1.5
2.0
Any type of lighting installation other than

above
1.0
1.5
No lighting
1.0
-
NOTE: Factoring of meteorological visibility for calculating Category II or III minima, or when a reported RVR is available, is not permitted.

9

LOWEST ACCEPTABLE AERODROME OPERATING MINIMA

Specified minima should not be less than the highest of:

(a)
Minima determined in accordance with the method described in this document.

(b)
Minima notified or accepted by the regulating authority of the State in which the aerodrome is located (State minima).

(c)
The Decision/Minimum Descent Heights listed below.

9.1

Precision Approach Aids

DH (ft)
ILS
200
PAR
200
MLS
200
NOTES: Lower minima may be authorised by the Authority.

9.2

Non-Precision Approach Aids

MDH (ft)
ILS (no glide path)
250
SRA (terminating at 2 nm)
250
SRA (terminating at 1 nm)
300
SRA (terminating at 2 nm)
350
VOR
300
NDB
300
VDF (QDM or QGH)
300
NDB/DME
300
VOR/DME
300
GPS PRIMARY
250

CHAPTER 4 APPENDIX C - RESCUE AND FIRE FIGHTING SERVICES (RFFS) LEVELS

Note: The contents of this Appendix are reproduced from ICAO Annex 6 Part I Attachment K.

ATTACHMENT K. RESCUE AND FIRE FIGHTING SERVICES (RFFS) LEVELS

1. Purpose and scope

1.1 Introduction

The purpose of this Attachment is to provide guidance for assessing the level of RFFS deemed acceptable by aeroplane operators using aerodromes for different purposes.

1.2 Basic concepts

1.2.1 While all aeroplane operators should aim to have the level of RFFS protection required by Annex 14, Volume I, Chapter 9, 9.2, some of the aerodromes currently used do not meet these requirements. Furthermore, Annex 14, Volume I provisions relate to the level of aerodrome RFFS to be provided for aeroplanes normally using an aerodrome.

1.2.2 If an aerodrome is exposed to a temporary reduction of its RFFS capability, Annex 14, Volume I, 2.11.3, requires that: *"Changes in the level of protection normally available at an aerodrome for rescue and fire fighting shall be notified to the appropriate air traffic services units and aeronautical information services units to enable those units to provide the necessary information to arriving and departing aircraft. When such a change has been corrected, the above units shall be advised accordingly."*

1.2.3 The following guidance is intended to assist operators in making the assessment required by Chapter 4, 4.1.4. It is not intended that this guidance limit or regulate the operation of an aerodrome.

2. Glossary of terms

Aerodrome RFFS category. The RFFS category for a given aerodrome, as published in the appropriate Aeronautical Information Publication (AIP).

Aeroplane RFFS category. The category derived from Annex 14, Volume I, Table 9-1 for a given aeroplane type.

RFFS category. Rescue and fire fighting services category as defined in Annex 14, Volume I, Chapter 9.

Temporary downgrade. RFFS category as notified, including by NOTAM, and resulting from the downgrade of the level of RFFS protection available at an aerodrome, for a period of time not exceeding 72 hours.

3. Minimum acceptable aerodrome RFFS category

3.1 Planning

3.1.1 In principle, the published RFFS category for each of the aerodromes used for a given flight should be equal to or better than the aeroplane RFFS category. However, if the aeroplane RFFS category is not available at one or more of the aerodromes required to be specified in the operational flight plan, an operator should ensure that the aerodrome has the minimum level of RFFS which is deemed acceptable for the intended use in accordance with the instructions contained in the operations manual. When establishing acceptable levels of minimum RFFS for these situations, the operator may use the criteria in Table K-1.

3.1.1.1 Intended operations to aerodromes with RFFS categories below the levels specified in Annex 14, Volume I, Chapter 9, 9.2, should be coordinated between the aeroplane operator and the aerodrome operator.

Table K-1. Minimum acceptable aerodrome category for rescue and fire fighting

Aerodromes (Required to be specified in the operational flight plan) (1)	**Minimum acceptable aerodrome RFFS category** (Based on published aerodrome RFFS category)
Departure and destination aerodrome	RFFS category for each aerodrome should be equal to or better than the aeroplane RFFS category.

One category (2) below the aeroplane RFFS category may be accepted where provided as a remission in accordance with Annex 14, Volume I, 9.2, but not lower than Category 4 for aeroplanes with maximum certificated take-off mass of over 27 000 kg and not lower than Category 1 for other aeroplanes.
Departure and destination aerodrome in case of temporary downgrade and Take-off alternate, destination alternate and en-route alternate aerodromes
Two categories below the aeroplane RFFS category, but not lower than Category 4 for aeroplanes with maximum certificated take-off mass of over 27 000 kg and not lower than Category 1 for other aeroplanes.
ETOPS en-route alternate aerodrome
RFFS Category 4 for aeroplanes with maximum certificated take-off mass of over 27 000 kg or not lower than Category 1 for all other aeroplanes, under the condition that at least 30 minutes' notice will be given to the aerodrome operator prior to the arrival of the aeroplane.

Notes.—

(1) If an individual aerodrome serves more than one purpose, the highest required category corresponding to that purpose at the time of expected use applies.

(2) Annex 14, Volume I, determines the aerodrome category for rescue and fire fighting according to 9.2.5 and 9.2.6 except that, where the number of movements of the aeroplanes in the highest category normally using the aerodrome is less than 700 in the busiest consecutive three months, the category provided may be one lower than the determined category.

3.1.2 For all-cargo operations, further reductions might be acceptable provided that the RFFS capability is adequate to arrest fire around the flight deck area long enough for the persons on board to safely evacuate the aeroplane.

3.2 In flight

3.2.1 In flight, the pilot-in-command may decide to land at an aerodrome regardless of the RFFS category if, in the pilot's judgement after due consideration of all prevailing circumstances, to do so would be safer than to **divert**.

CHAPTER 4 APPENDIX D - ONE-ENGINE-INOPERATIVE FERRY FLIGHTS - 3 OR 4 ENGINED AEROPLANES

1 GENERAL

1.1
A one-engine-inoperative ferry flight should never be seen as a 'normal operation' since the margins for control and performance, especially in the approach and climb phase, can be significantly different from those associated with normal operations, and in particular, landing distance requirements. The use of such a procedure should be considered only when no reasonable alternative course of action is available and should apply only to three or four engined aircraft. Operators, therefore, must always consider and favour bringing the spares and rectification team to the aircraft to render it serviceable rather than conducting an engine inoperative ferry flight.

1.2
Companies who consider that they may need to resort to one-engine-inoperative ferry flights should set up procedures in advance of such an operation, in order to ensure that it is planned and handled in a considered manner.
One-engine-inoperative ferry flights should not be considered unless the limitations,

performance and operational procedures are specified in the approved Aircraft Flight Manual (AFM).

1.3

No Public Transport or Aerial Work operations are permitted for one-engine-inoperative ferry flights.

2

PROCEDURES

The following are items which should be considered, and included as instructions in the operations manuals (OM) and Engineering Instructions prepared by the operator.

(a)

Procedures to ensure that all AFM and Maintenance Manual (MM) requirements are strictly adhered to.

(b)

A requirement for a formal statement by a responsible engineer that the aeroplane has been prepared for an engine-inoperative ferry flight with specified minimum equipment. In making such a statement, consideration should be given to the other sources available for hydraulics, electrics, air conditioning and other essential services. For example, in the case of the BAe 146, the Auxiliary Power Unit (APU) must be serviceable to provide added hydraulic/electrical power in the event of the subsequent failure of a paired engine.

(c)

The nomination of commanders and co-pilots authorised to carry out such flights; special authorisations needed from management before each flight; persons on board to be limited to nominated essential crew only.

(d)

A programme specified in the Training Manual (TM) which identifies the minimum necessary training that is required before a commander or co-pilot is considered authorised. As a minimum this should include satisfactory completion of an engine-inoperative take-off and two engine out go-around procedures in a simulator approved for such training, together with pre-flight planning of such an operation. Ideally the exercise should have been practised on two separate occasions before a crew is cleared to operate one-engine-inoperative ferry flights. The required experience should, depending on the complexity of techniques involved, include one engine-inoperative techniques training, or practice in an approved flight simulator, within a period not exceeding 13 months prior to the flight. The crew should be certificated as competent by the operator.

(e)

The requirements for actual and forecast weather conditions to be at least a minimum cloud base of 1000 ft agl and 2 km visibility, or as specified in the AFM for one-engine-inoperative take-off and landing procedures, whichever is the greater. A conservative maximum crosswind limit should also be applied; it is recommended to be not more than 7 kts if from the same side as the inoperative-engine, unless otherwise quoted in the AFM. One-engine inoperative ferry take-offs are permitted from a dry or wet runway unless otherwise stated in the AFM, but are not permitted from a slippery runway or from a runway contaminated by standing water, snow or slush.

(f)

Consideration should be given to fuel planning requirements for flight with one-engine-inoperative, giving particular attention to consumption rates.

(g)

Flight crews should be thoroughly familiar with the handling techniques to be used during take-off and the procedures to be followed in the event of a further engine or other system failure. These aspects should be fully covered during the take-off briefing. The AFM provides full details applicable to each aeroplane type, and the handling technique may vary depending upon whether the inoperative engine is inboard or outboard (4-engined types), or is centreline or non-centreline mounted (3-engined types). The procedure may specify setting rudder trim away from the inoperative engine. Generally, it will not be possible to set take-off power on an asymmetric serviceable engine from the start of the take-off run; the asymmetric thrust will need to be progressively increased as the aeroplane accelerates. It is likely that the AFM procedure will call for use of nose wheel steering, in addition to rudder, to maintain directional control initially. While the thrust setting technique is intended to ensure that the thrust asymmetry always remains within the directional control capability of the aeroplane, it is also important that the asymmetric thrust setting is not delayed so as to erode the margin allowed in the scheduling of the take-off distance.

(h)

It is important that flight crews appreciate the handling and performance requirements on which the limitations for one-engine-inoperative ferry take-offs are based, as these are significantly different from normal operations. The major consideration is that the scheduled take-off distance and the handling characteristics on which the associated operating speeds are based, take no account of the possible failure of a further engine prior to the aeroplane becoming airborne. It is accepted, therefore, with such operations that a period of risk may exist during which, in the event of a further engine failure, the aeroplane can neither stop in the remaining distance available nor continue the take-off. The AFM may provide advisory data on accelerate stop distances from various stop speeds. However, such stop speeds cannot be considered as equivalent to a normal V_1 as a continued take-off capability in the event of a further engine failure above this speed is not guaranteed and the scheduled take-off distance need not take account of the accelerate stop distance. This risk period can only be eliminated totally if, at the planned take-off weight, the runway is of sufficient length that there is adequate runway remaining to permit a stop at a speed of not less than V_R. However the situation will still be influenced, one way or another, by the particular characteristics of the aeroplane type concerned and whether the second engine failure adds to or reduces the thrust asymmetry. Once the aeroplane is airborne, continued flight will be possible following the failure of a further engine, but the directional control margins and climb gradient capability will be considerably less.

(i)

Operators should assess their OMs to ensure that all the points discussed in subparagraphs (g) and (h) above, and as elaborated in the particular AFM, are covered and are strictly adhered to before flight crews undertake any one-engine-inoperative ferry flights.

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CHAPTER 4
APPENDIX E
ONE-ENGINE-INOPERATIVE FERRY FLIGHTS - HELICOPTERS
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CHAPTER 4 APPENDIX F - STORAGE OF DANGEROUS GOODS

1 GENERAL

1.1
The worldwide requirements for the carriage by air of Dangerous Goods (DG) are comprehensively addressed in the International Civil Aviation Organisation's 'Technical Instructions for the Safe Transportation of Dangerous Goods by Air' (ICAO TIs). By comparison, requirements for pre or post-flight storage of DG at airports are mostly the responsibility of each state's Fire Services authority; in consequence, there is no worldwide standardisation of storage requirements with the result that standards enforced by individual Fire Services vary widely.

1.2
As there have been a number of accidents or major incidents worldwide in recent years involving DG, either when in storage at airports or during carriage by air, it is important that the relevant storage and carriage requirements are clearly understood by operators and their cargo agents. Insofar as storage requirements are concerned, Hong Kong AOC holders and their agents are expected to comply with the standards

set by the Hong Kong Fire Services Department (FSD) in Hong Kong or competent authorities outside Hong Kong for outstations.

1.3

The FSD's DG storage requirements can be summarised as follows for reference. However, operators should consult FSD about the latest requirements:

(a)

DG should be stored in a delineated, well ventilated area, separated from non-DG cargo.

(b)

The storage area should display clearly visible signs indicating 'DANGEROUS GOODS' or 'CAT 2/3/4/5* DG' or 'ICAO CLASS 1-9* DG' and 'NO SMOKING'.

* appropriate class or category

(c)

The DG acceptance area should display a notice giving information about the transport of DG, as per ICAO TI.

(d)

Suitable fire extinguishing equipment should be provided immediately adjacent to the DG storage area.

(e)

DG items should be segregated from non-DG cargo, and certain classes / divisions of DG must be segregated from each other as required by the ICAO TI.

(f)

DG items should be stored and handled in accordance with the orientation label displayed on the item.

(g)

Radioactive items should be stored in accordance with local state requirements, preferably in a separate and secure Radioactive store.

(h)

Cargo agent's staff should be provided with written responsibilities in respect of DG, in particular the need for careful handling at all times, and for a sound knowledge of the relevant emergency procedures.

1.4

At those airports where DG is 'accepted' for transportation, operators should ensure that adequate numbers of their own or their agent's staff hold IATA DG Licences to provide the requisite standards of handling and supervision.

1.5

Where little DG is handled at a particular outstation, dedicated DG storage facilities need not be provided. However, in this situation, specific one-off arrangements must be made between the operator, the cargo agent and the shipper to ensure that the required procedures are followed.

CHAPTER 4 APPENDIX G – MIXED FLEET FLYING (MFF)

1.
General

1.1
MFF will only be considered for those aircraft types which are conducive to Cross Crew Qualification (CCQ) training, as recommended by the aircraft manufacturer.

1.2
CCQ is the process of training and testing whereby the similarities of two or more aircraft are such that substantial credit for training and testing on Type A can be credited to Type B, within the same 'Family' of aircraft.

1.2.1 The minimum experience level to commence CCQ Training Type A to Type B is as follows:

(a)
Minimum four months after Aircraft Line Check on Type A, and;

(b)
Minimum 200 hours on Type A, and;

(c)
Minimum 20 sectors on Type A.

1.2.2 On completion of CCQ from Type A to Type B, the first take-off and landing in Type B must be completed within 21 days of completion of the box items required by the appropriate **Blue DCA528 Form**.

1.2.3 The minimum experience level on Type B prior to clearance to MFF is as follows:

(a)
Minimum 50 hours on Type B or;

(b)
10 Sectors on Type B.

1.3
In order to qualify for MFF, on completion of the consolidation period on Type B, the candidate must hold a valid Proficiency Check (PC) and Aircraft Line Check on Type A at the time he/she completes the Aircraft Line Check on Type B.

1.4
Rostering MFF Crews
MFF crews may be rostered for the MFF qualified types within the same FDP.

1.5
Scheduled 9 and Schedule 11 Requirements − MFF Crews

1.5.1 **Schedule 9**

(a)
On completion of the CCQ course and within 6 months of the last PC renewal on Type A, an initial PC test on Type B must be completed.

(b)
Subsequent PCs must alternate, and must be conducted such that there is never more than 13 months between same Type PCs, nor less than 4 months between alternate Type PCs.

(c)
Should two different Type PCs be conducted within 4 months of each other, the first of these two must be renewed no later than 6 months after the date of the second PC renewal.

(d)
Should either Type PC expire, then both Type PCs are deemed to have expired, and **BOTH** must be renewed before MFF qualification is restored. Once the first PC has been renewed, the pilot may then operate that Type only until the PC for the other Type has been renewed. After both PCs have been renewed, subsequent renewals must be in accordance with sub para's (b) and (c) above.

1.5.2 **Schedule 11 – Line Check (LC)**

Requires an Exemption from AN(HK)O 1995

(a)
Having completed a LC on Type B during the CCQ process, a renewal of the Type A Line Check must be completed no later than 13 months after the LC on Type B.

(b)
Subsequent Line Checks must alternate, and must be conducted such that there is never more than 13 months between different Type LCs, and never more than 25 months between same Type LCs.

(c)
Should either Type LC expire, then both Type LCs are deemed to have expired, and **BOTH** must be renewed before MFF qualification is restored. Once the first LC has been renewed, the pilot may then operate that Type only until the LC for the other Type has been renewed. After both have been renewed, subsequent renewals must be in accordance with sub para (b) above.

1.5.3 **Emergency Manoeuvres and Procedures**

Requires an Exemption from AN(HK)O 1995

(a)
Validity is in accordance with the PC stated in para 1.5.1 above.

(b)
Emergency Manoeuvres and Procedures on Type A are valid on Type B and vice versa.

1.6

MFF Licence Procedures

On completion of the CCQ course for aircraft Type B the completed CCQ Blue DCA528 Form, together with the pilot's licence, should be submitted to the **CAD** Personnel Licensing Office (PLO) for the issue of a standard C of T. The C of T pages will be endorsed for both Types A and B and signed by a PLO Officer. The pilot's licence, together with the new C of T page will be returned to the said pilot. It is to be noted that the MFF C of T is not valid until the said pilot has 50 hours or ten sectors on type B (see para 1.2.3 above).

1.7

MFF Recency Requirements

1.7.1 **35 Day Recency**

A pilot may not fly as a MFF Commander unless he has carried out at least one Take-off and one Landing in either aircraft Type A or B during the previous 35 day period. Revalidation may be carried out in either the simulator or aircraft.

1.7.2 **3 Months Recency**

Requires an Exemption from AN(HK)O 1995

A Commander or Co-pilot, to maintain the three months MFF recency, must complete a minimum of two take offs and two landings in either aircraft Type A or Type B. A minimum of one take off and one landing must then be completed in the other Type.

Recency may be re-validated in a simulator approved for the purpose (see General Exemption − Recency Re-validation).

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CHAPTER 5 - TRAINING AND TESTING

1 GENERAL REQUIREMENTS FOR AIRCRAFT FLIGHT CREW TRAINING AND TESTING

1.1 All training courses require **CAD** approval.

1.2 The statutory requirements relating to the training and periodical testing of aircraft flight crews are specified in the Air Navigation (Hong Kong) Order [AN(HK)O]. The primary purpose of this chapter is to indicate the nature of the arrangements considered necessary to secure an adequate standard of compliance and to specify those tests which form part of that compliance.

1.3 Under normal circumstances, a person administering any periodic check specified in Schedule 11 to the AN(HK)O should be currently qualified to at least the standard that the person being examined is required to demonstrate during that check.

1.4 The training and periodic tests of all crew members are required to be conducted in accordance with syllabi agreed with the Department and published in the operator’s training manual. Proposed changes to syllabi or departures from training programmes must be agreed by the Department before implementation.

1.5 Operators, who wish to outsource initial, recurrent and conversion training, must ensure that **CAD** approves the training courses. Approved training organisations or the equivalent that have State regulatory approval, may be accepted by **CAD** to conduct training for Hong Kong operators, however, courses still require **CAD** approval. The qualification, training and approval of training and examining personnel utilised by an organisation, will normally be required to be in accordance with paragraphs 4.1 - 4.8 of this Chapter. Additional requirements for the personnel utilized by organisations approved by other States are detailed in paragraph 4.9 of this Chapter. The training provided and flight documentation used should reflect the operators’ flight safety documents system.

1.6 Operators, who outsource training to training organisations that do not have formal State approval, will need to consult **CAD** on an individual basis to establish the approval requirements for their courses, the adequacy of training facilities, qualification requirements and approval of personnel.

2
TRAINING MANUAL
2.1
It is a statutory requirement that a training manual shall contain all such information and instructions as may be necessary to enable persons appointed by the operator to give or supervise the training, practice and periodical tests to perform their duties.
2.2
Care must be taken not to interpret 2.1 as meaning that a training manual should contain technical and operating information for general instructional purposes. Rather, it should remain concise in its purpose of giving formal expression to the operator's training policy and requirements, together with adequate guidance on these matters to instructors and examiners.
2.3
The training manual is regarded by the Department as the primary indication of the standards of training and testing likely to be achieved by the operator. One copy must be submitted to the Department, together with any later amendments or additions.

2.4
Each copy of a manual must bear a serial number and a distribution list must be held by a person responsible for issuing amendments. Each volume of the manual must be numbered, bear a title and a list of contents giving a clear indication of its scope. The title of the person or department responsible for the issue of the manual must also be included. At the front of each volume there must be an amendment page to record amendment number, date of incorporation, signature of person amending and page(s) or paragraph(s) affected. The numbering of pages, sections, paragraphs etc should be orderly and systematic so as to facilitate immediate identification of any part of the subject matter. The standard of printing, duplication, binding, section dividers, indexing of sections etc should be of sufficient quality to enable the document to be read without difficulty and to ensure that it remains intact and legible during normal use.
2.5
The amendment of a manual in manuscript is not acceptable. Changes or additions, however slight, must be incorporated by the issue of a fresh or additional page which must be dated and on which the new or additional material is clearly marked. It is therefore recommended that items likely to be the subject of frequent change, such as lists of appointments, are shown on pages that do not include more permanent text.
2.6
Although the training manual is part of the general operations manual, it should be a separate document addressed to the training staff, each of whom should have a personal copy. The form that the manual takes will vary considerably according to the size and complexity of the operator's organisation and the aircraft used; its adequacy will be assessed solely on the basis of its suitability for the operator's particular needs and circumstances. It is therefore important that all training staff are aware of the need to keep the document under review and ensure that it accurately reflects the operator's circumstances at the time.
2.7
In addition to the more general matters of policy, the following in particular must be included in the manual:
(a)
operator's requirements in respect of qualifications, training and experience of

training staff;
(b)
the name and title of the person ultimately responsible for flight crew training and testing and lines of reporting to and from that person's post;
(c)
a comprehensive statement of the duties and responsibilities of all training staff, which should include their names, the type of training and/or testing which they may conduct and the types of aircraft on which they are authorised;
(d)
minimum standards of experience and qualification, and of initial and periodical training to be met by all aircraft flight crews for each type of aircraft used by the operator;
(e)
detailed syllabi for both ground and flying training and specimen record forms in respect of all training and tests; the minimum hours/sectors necessary to meet flight training requirements;
(f)
a list of the required competency tests and their frequency;
(g)
arrangements for administering and recording the periodical tests of all flight crew;

(h)
limitations on flying more than one type or variant;
(i)
policy with regard to crewing together of crew members under training;
(j)
training of pilots to act as relief crew occupying other than their normal crew positions;
(k)
syllabus covering training requirements for promotion of co-pilot to Captain;
(l)
checking of pilots in handling and non-handling pilot duties;
(m) chain of command in an emergency, when training captain not occupying a pilot's seat;
(n)
methods of simulating instrument flight conditions; methods of simulating engine failure and the form of words to be used;
(o)
practice of abandoned take-off during training flights, normally a restriction to speeds not in excess of 50% of V_1;
(p)
procedures for touch-and-go or stop-go landings with particular emphasis on division of duties, considerations of flap settings, runway length, brake cooling and terrain;
(q)
syllabus covering engineering perspectives including MEL/CDL, technical log, airworthiness defects;
(r)
proper flight crew coordination and training in all types of emergency and

abnormal situations or procedures caused by power plant, airframe or systems malfunctions, fire or other abnormalities.
(s)
instructions and guidance on how Predictive and Low Level Windshear initial and recurrent training should be conducted, with emphasis on the positive action required to minimise the effect of these conditions if encountered during take-off, on the approach and landing. Advice must also be given on the avoidance of these conditions;
(t)
limitations on training and testing in the course of flights for the purpose of public transport. Note particularly that the simulation of instrument flight conditions and of emergencies affecting the flight characteristics of the aircraft is prohibited in the course of flights for the public transport of passengers;
(u)
instructions covering retesting and retraining after unsatisfactory performance or periods of non flying due to illness or other causes;
(v)
the use of full flight simulators, other training devices and copies of Approval documents held;
(w)
special equipment training: FMS, INS, E/GPWS, ACAS, HUD/EVS, etc.;
(x)
Human Factors (HF) and Crew Resource Management (CRM) training;

(y) Safety Management System training;
(z) instructions and procedures covering pilot incapacitation and the roles of all crew members;
(aa) aviation security training;
(bb) guidance on the carriage of dangerous goods in accordance with the current edition of the ICAO Technical Instructions for the Safe Transport of Dangerous Goods by Air Doc 9284; and
(cc) prevention of runway incursion in accordance with the current edition of the ICAO Manual on the Prevention of Runway Incursions (Doc 9870).

3
TRAINING AND TESTING STAFF

3.1
A person, whose qualifications and experience are agreed by the Department to be suitable, must be designated to take general and overall charge of arrangements for the training and testing of aircraft flight crews. This person's name, authority, responsibilities and reporting routes must be clearly defined in the operations manual.
3.2
Under the control of the person in charge of training, the operator will need to appoint examiners and instructors to conduct periodical tests and give the practical training, as necessary, to satisfy the requirements of the AN(HK)O. The number of training staff employed is expected to be consistent with the operator's task and their qualifications and experience are expected to reflect the role and types of aircraft used.
3.3
It is important that examiners and instructors are experienced and qualified for their task, and operators are to ensure that they are adequately trained in teaching and examining techniques. Where it is intended that they will carry out tests required under

Schedules 9 and/or 11 of the AN(HK)O in an approved flight simulator, they themselves must be duly approved by the Department for that purpose.

3.4

Exceptionally, operators may need to use the services of manufacturers' pilots or those from foreign operators for flight training, testing and route Line Flying Under Supervision (LFUS). Such training staff must be familiar with the operations manual and the training manual of the operator to whom they are temporarily attached. The operator must obtain certified copies of duty and rest period records for the 28 days prior to the crew members being rostered for duty; appropriate flight/duty records must be maintained for the period that the crews are assigned to the operator. As a general rule, a Hong Kong licence or a temporary validation of a foreign licence will have to be obtained. The operator should contact the **CAD** Personnel Licensing Office to obtain the necessary Certificate of Validation for the foreign pilots. The Department will specify requirements in individual cases. When such pilots are used for training they must be properly licensed and authorised to conduct initial type ratings, instrument rating renewals and competency checks. To conduct LFUS, pilots are required to hold full company command qualification for public transport flights and to meet all Schedule 11 competency check requirements.

4

TRAINING AND EXAMINING STAFF QUALIFICATIONS

4.1

Schedule 9 (Flight Crew Licences)

4.1.1 Flight tests for the initial issue or renewal of Aircraft Ratings and renewal of Instrument Ratings may only be conducted by examiners so authorised by the Director-General of Civil Aviation. Applicants for appointment as Authorised Examiners (AE) must be sponsored by their employer. Any authority becomes automatically invalid the moment the examiner leaves the sponsor's employment.

4.1.2 The applicant for appointment as an AE for aeroplanes shall hold an appropriate licence and ratings and a valid medical certificate. As a general guideline, the applicant is expected to have a minimum of 2,000 hours flight time as a pilot of multi-engined aeroplanes and has achieved high standards in flying ability as evidenced by at least two Proficiency Checks being separated by an interval of not less than 4 months with his current employer sponsoring his AE application. An applicant for AE for helicopters is expected to have at least 500 hours as the pilot-in-command and at least 250 hours as a flight instructor/training captain.

4.1.3 Prior to granting authorised status as an Instrument Rating Examiner (IRE) and/or a Type Rating Examiner (TRE), the Department must be satisfied that the applicant is a fit person to hold the authorisation and qualified to do so by reason of his knowledge, experience, competence and skill.

4.1.4 In assessing the above criteria the applicant's previous conduct will be taken into consideration. The applicant must meet certain experience levels, have completed the **CAD** Authorised Examiner's Course (**CAD** AE course) and have satisfactorily conducted a test whilst observed by an Operations Inspector.

4.1.5 The **CAD** AE course is undertaken using facilities provided by approved Hong Kong operators. It consists of briefings, facilitation and de-briefings utilising English as conversational as well as aviation technical language. Therefore applicants, in addition to meeting the high standards referred to in the above paragraphs, should also have attained the requisite language skills in order to ensure a successful course outcome.

4.1.6 The AEs who have previously successfully completed the **CAD** AE course and who have not exercised the privileges of their authority within the preceding five years will be required to attend the first two-day **CAD** briefings of the **CAD** AE course prior to being considered for reappointment.

4.1.7 A TRE (simulator) must be qualified on type under the provisions of the AN(HK)O. His ability to perform the functions while occupying the co-pilot's seat must be checked and recorded by the operator.

4.1.8 An examiner's authority will be valid for three years in the case of Hong Kong based examiners and shorter than three years for non-Hong Kong based examiners at approved training establishments. The tests that an AE is authorised to conduct are stipulated on the Letter of Authority (LoA) granted by **CAD**. The AE must ensure that he exercises the privileges in accordance with the LoA at all times.

4.1.9 A **CAD** Flight Operations Inspector (FOI) or a person properly delegated by the Director-General of Civil Aviation will renew an examiner's authority at the appropriate period. In the event that a satisfactory standard is not achieved, then the examiner's authority will be revoked by the **CAD**. Further assessment for re-appointment may be made after further training, agreed between his company and HK **CAD**, has been undertaken.

4.1.10 All applications for appointment as an AE must include the following particulars:

(a) full name;

(b) licence type, number and expiry date;

(c) aircraft types endorsed in Part 1 of the licence;

(d) date of last Certificate of Test (Aircraft Rating) for aircraft type to which the application relates, and whether annotated P1, P2 or E1;

(e) date of last Certificate of Test (Instrument Rating) and type of aircraft on which tested;

(f) date of last medical;

(g) total hours P1 or E1 - all types;

(h) total hours P1 or E1 - in previous 12 months on type to which the application relates;

(i) total hours PI or E1 - all turbo-jet aircraft, if application relates to a turbo-jet aircraft;

(j) total hours P1 or E1 - all turbo-prop aircraft, if application relates to turbo-prop aircraft;

(k) details and result of any courses in instructional or examining techniques undertaken;

(l) details, with supporting documentation, of any examining authority held, or previously held, from any other regulatory authority;

(m)
any other relevant information.
4.2
Schedule 11 (Public Transport)
4.2.1 An operator is responsible for ensuring that all persons have the training, experience and practice and have undergone the periodical tests specified in Part B of Schedule 11 to the AN(HK)O, before acting as crew members on any flight for the purpose of public transport.
4.2.2 In practice, the Schedule 9 tests for renewal of Instrument and Aircraft Ratings are integrated within the operator's bi-annual competency checks (proficiency checks). Operators are therefore required to train and subsequently appoint pilots from within the Company as AEs and Approved Persons (Simulator Instructors). The following appointment and subsequent career progression is therefore recommended for training and check personnel:
(a)
Line Training Captain
(b)
Type Rating Instructor – Simulator (TRI – Simulator)

(c)
Type Rating Examiner/Instrument Rating Examiner - Simulator Only [TRE/IRE - Simulator Only (Exclude Simulator Base Training (SBT)]
(d)
Type Rating Examiner/Instrument Rating Examiner - Simulator Only (Include SBT) [TRE/IRE – Simulator Only (Include SBT)]
(e)
Type Rating Examiner/Instrument Rating Examiner – Aircraft and Simulator (TRE/IRE – Aircraft and Simulator)
4.3
Line Training Captain
4.3.1 The role of the line training captain is vitally important in a balanced training regime. Much of the responsibility for the standardisation of operating procedures and for sound flight deck management will depend on the observations and analytical skills of the line training captains. The importance of line training and testing cannot be over emphasised and the calibre of the staff should reflect this. Specific responsibilities may include sectors operated under supervision following type conversion, final line checks, annual line checks and renewal of Captain's 35 day recency.
4.3.2 A line training captain shall hold an appropriate licence and ratings and a valid medical certificate. As a general guideline, a line training captain is expected to have a minimum of 2,000 hours flight time as a pilot of multi-engined aeroplanes or as a helicopter pilot, of which at least 500 hours as the pilot-in-command and completed training specified in the company manual for the appointment.
4.4
TRI – Simulator
4.4.1 The duties of a "TRI – Simulator" include the conduct of simulator training exercises during initial type conversion including low visibility operations. They may also include Schedule 11 bi-annual competency and instrument approach-to-land (including low visibility operations) tests, and renewal of three monthly recency in simulators approved for that purpose.
4.4.2 Prior to appointment, a "TRI – Simulator" must complete an approved course in

instructional techniques, and also induction training in his duties. He is to be observed by an Operations Inspector while conducting Schedule 11 items prior to appointment as an Approved Person, and again on renewal. However the renewal of this appointment may be delegated to a company AE, in which case the airline is to advise the Department when the renewal is complete so that a renewed certificate can be issued.

4.5

TRE/IRE - Simulator Only (Exclude SBT)

4.5.1 Persons nominated to be "TRE/IRE - Simulator Only (Exclude SBT)" must complete an approved course in instructional and examining techniques, and also induction training in their duties. They will then be observed by an FOI while conducting simulator tests for Schedule 9 and Schedule 11 ratings prior to appointment as Authorised Examiners (Simulator). However the "TRE/IRE – Simulator Only (Exclude SBT)" may not conduct SBT.

4.6

TRE/IRE – Simulator Only (Include SBT)

4.6.1 Persons nominated to be "TRE/IRE – Simulator Only (Include SBT)" must complete induction training in their duties. For the initial appointment as a "TRE/IRE – Simulator Only (Include SBT)" and on each subsequent type change, they must be observed by an FOI while conducting Base Training (BT) in the simulator for the appointment as "TRE/IRE – Simulator Only (Include SBT)" for that type. The FOI will observe the TRE operating from both control seats.

4.7

TRE/IRE - Aircraft and Simulator

4.7.1 Persons nominated to be "TRE/IRE – Aircraft and Simulator" must complete induction training in their duties. For the initial appointment as a "TRE/IRE – Aircraft and Simulator" and on each subsequent type change, they must be observed by an FOI while conducting tests in an aircraft for the issue of aircraft ratings prior to appointment as Authorised Examiners (Aircraft) for that type. The FOI will observe the TRE operating from both control seats. However when the TRE subsequently endorses on an additional family type with the same number of power plants i.e. A320/A330, then the aircraft check may be completed from either control seat. The authority to conduct tests by the "TRE/IRE – Aircraft and Simulator" also includes SBT and Aircraft Base Training (ABT).

4.7.2 AEs who fly two aircraft types that are classified for mixed fleet flying (MFF), will be observed on each type for initial **CAD** authorisation. Subsequent AE renewal may be undertaken on either type and will be valid for both, provided the AE maintains recency on both types.

4.8

Validity of Appointments and Recency Requirements

4.8.1 **Validity of appointments**

TRE/IREs and Approved Persons will normally be appointed by the Department for a maximum period of 3 years, and normally a shorter period for those employed by training organisations and manufacturers based outside of Hong Kong. Both may be subject to review at more frequent intervals by the Department and additional requirements under paragraph 4.9 of this Chapter. Operators are responsible for ensuring that the competence of training staff appointed by them to discharge the operator's responsibilities under Schedule 11 of the AN(HK)O is kept under regular review.

4.8.2 **Recency Requirements**
An AE is required during each and every 12-months period to conduct the following minimum number of aircraft/simulator details, in order to retain validity:
(a)
TRE/IRE – Simulator Only (Exclude SBT)
Four separate simulator sessions, which include Instrument Rating Renewal (IRR)/Aircraft Rating Renewal (ARR) or Aircraft Rating (AR) tests during each session.

(b)
TRE/IRE – Simulator Only (Include SBT)
Four separate simulator sessions, two of which will consist of Zero Flight Time (ZFT) training and testing and two separate simulator sessions, which include AR and/or Instrument Rating (IR) test.
(c)
TRE/IRE – Aircraft and Simulator
A minimum of two Base Training sessions, one of which may be a simulator ZFT session and a minimum of two simulator sessions that include tests for IRR/ARR or initial AR tests.
Note: An AE who has not met the minimum requirements must report the circumstances to the **CAD** so that the continued validity of his appointment can be considered. The TRE/IRE may then be advised of any recency revalidation requirements and/or the reissue of the LoA. Failure to make such a report may invalidate subsequent tests.
4.8.3 Waivers may be given by the Department to the instructional and examining techniques requirements for nominees with acceptable previous experience and qualifications. On conversion to a new type, TRE/IREs must normally complete the induction training and observation requirements specified in paragraphs 4.6 and 4.7.
4.9
Training Organisation Approved by a Foreign National Aviation Authority (NAA)
4.9.1 This paragraph must be read in conjunction with paragraph 1.5 of this Chapter, which contains the general requirements for an operator to outsource the training to a training organisation or manufacturer.
4.9.2 In general, personnel utilised by a training organisation or manufacturer acceptable to **CAD** will normally be required to meet the qualification, training, approval and validity requirements listed in the paragraphs 4.1 - 4.8. For personnel utilised by a foreign approved training organisation, certain differences to qualification and validity requirements are listed below.
(a)
An examiner from an organisation nominated by an operator for appointment as an AE will require authorisation by **CAD**. This examiner shall possess a valid examiner approval issued by a foreign NAA acceptable to **CAD**. An authorisation will have a validity to be determined by **CAD** which may be shorter than 3 years from the month of appointment or renewal. Operators are reminded that they must submit a request for the appointment of an AE in accordance with paragraph 4.1.10.
(b)
For an operator who has obtained **CAD's** approval to use a foreign approved organisation for recurrent training and checking and has obtained **CAD's**

agreement to undertake bi-annual testing in aircraft, appointment of AEs for "TRE (aircraft only)" or "TRE/IRE (aircraft only)" may be considered. Their qualification, training, appointment requirements must be agreed with the operator's FOI. Their recency requirements are as follows :-

(i)

TRE – Aircraft Only

Two separate aircraft training sessions of which at least one must include a test for a Hong Kong licence rating.

(ii)

TRE/IRE – Aircraft Only

Two separate aircraft training sessions, one or both of which include an IRR/ARR or AR test.

The authority for the above AE will be considered case-by-case.

(c)

TRI – Simulator. A TRI employed by an **approved** organisation outside Hong Kong, may be qualified to conduct simulator training without the necessity of formal **CAD** approval.

(d)

A TRI required to conduct tests in accordance with AN(HK)O Schedule 11, will need **CAD** approval.

(e)

Personnel used for Safety Equipment and Procedure training will require **CAD** approval if required by the operator to conduct AN(HK)O Schedule 11 tests.

4.9.3 *Course Completion Certificate.* Upon completion of any outsourced training, an operator must obtain a certificate from the contractor, confirming that the ground and/or simulator training course has been completed to the satisfaction of the approved organisation.

5

SUPERVISION OF EXAMINERS

The procedures to be followed and standards to be applied by AEs are set out in **CAD** 170 "Authorised Examiners Handbook". Inspectors will observe the conduct of tests by AEs, and of crew training generally, during the currency of an Air Operator's Certificate. The purpose of these inspections is to ensure that training and testing is in compliance with the operator's training manual and within the terms and conditions of the appointment of **CAD** AEs.

6

PROBLEMS OF SMALL OPERATORS

The arrangements discussed in the foregoing paragraphs may not be practicable in the case of a very small organisation operating one or two aircraft and employing a small number of aircraft flight crews. In larger organisations employing several pilot examiners, one can test the other and there is no real difficulty. However, where the total complement of pilots warrants only one examiner, arrangements should be made for his periodical tests to be conducted by an independent examiner outside the operator's organisation; in such cases the Department should be notified. The Department will then assess the suitability of the nominated independent examiner and, if acceptable, make arrangements for the issue of the appropriate LoA. Once the identity of the independent examiner has been agreed upon, the operator must send a letter of agreement to the Department covering the arrangement made.

7 PART TIME AND 'FREELANCE' CREW MEMBERS

7.1
Operators should ensure the competence of any part-time or 'free-lance' pilots they employ. Schedule 11 tests carried out to establish the competence of an operator's pilots, must be conducted either by the operator himself or by another operator, under arrangements detailed in the company's training manual and agreed by the Department, which ensure that the pilot is competent to perform all the duties and responsibilities laid upon him by the operator.

7.2
Additionally, the operator must satisfy himself that the flight crew member is fully conversant with the company's operations manual and flight procedures. In the case of Captains, route competency must also be established and certified. In all cases, flight and cabin crew must be tested as to their knowledge of emergency/survival drills and equipment. Operators must obtain certified copies of duty and rest period records for the 28 day period prior to the rostering of the crew members concerned, and appropriate flying duty records must be maintained for the period that the operator employs such crews.

8 OPERATION ON MORE THAN ONE TYPE OR VARIANT

(See Appendix B to Chapter 5)

8.1
Aeroplanes

(a)
An operator shall ensure that a flight crew member does not operate on more than one type or variant, unless the flight crew member is competent to do so.

(b)
When considering operations of more than one type or variant, an operator shall ensure that the differences and/or similarities of the aeroplanes concerned justify such operations, taking account of the following:

(i)
The level of technology;

(ii)
Operational procedures;

(iii) Handling characteristics.

(c)
An operator shall ensure that a flight crew member operating more than one type or variant complies with all of the requirements prescribed in Schedules 9 and 11 for each type or variant unless the Department has approved the use of credit(s) related to the training, checking and recency requirements.

(d)
An operator shall specify appropriate procedures and/or operational restrictions, approved by the Department, in the operations manual, for any operation on more than one type or variant covering:

(i)
The flight crew members' minimum experience level;

(ii)
The minimum experience level on one type or variant before beginning training for and operation of another type or variant;

(iii) The process whereby flight crew qualified on one type or variant will

be trained and qualified on another type or variant; and
(iv) All applicable recency requirements for each type or variant.

8.2
Helicopters and Aeroplanes
(a)
When a flight crew member operates both helicopters and aeroplanes:
(i)
An operator shall ensure that operations of helicopter and aeroplane are limited to one type of each.
(ii)
The operator shall specify appropriate procedures and/or operational restrictions, approved by the Department, in the operations manual.

8.3
Cross Crew Qualified
If a flight crew member is to qualify on a type which is similar to a type on which he is currently qualified, his conversion training to the second type may be suitably abbreviated, subject to agreement with the Department. The crew member is then 'Cross Crew Qualified (CCQ)'. Details of the agreed abbreviated training course, and subsequent recurrent training, are to be specified in the operations manual.

8.4
Mixed Fleet Flying
A flight crew member who is Cross Crew Qualified may be allowed to operate both types ('Mixed Fleet Flying' or 'MFF') subject to agreement with the Department. Details of the agreed recency and recurrent training and testing requirements to enable the crew member to operate both types are to be specified in the operations manual.

9
RECURRENT TRAINING AND CHECKING

9.1
General

9.1.1 Line checks, route and aerodrome competency and recent experience requirements are intended to ensure the crew member's ability to operate efficiently under normal conditions, whereas other checks and emergency and safety equipment training are primarily intended to prepare the crew member for abnormal/emergency procedures.

9.1.2 The line check is normally performed in the aircraft. All other training and checking should be performed in the aircraft or an approved flight simulator or, in the case of emergency and safety equipment training, in a representative training device. The type of equipment used for training and checking should be representative of the instrumentation, equipment and layout of the aircraft type operated by the flight crew member.

9.1.3 The line check is considered a particularly important factor in the development, maintenance and refinement of high operating standards, and can provide the operator with a valuable indication of the usefulness of his training policy and methods. Line checks are a test of a flight crew member's ability to perform a complete line operation satisfactorily, including pre-flight, taxi operations and active runway identification, and post- flight procedures and use of the equipment provided, and an opportunity for an overall assessment of his ability to perform the duties required as specified in the operations manual. The route chosen should be such as to give adequate representation of the scope of a pilot's normal operations. When weather conditions preclude a manual landing, an automatic landing is acceptable. The line check is not intended to determine competence on any particular route.

9.1.4 In addition to the above duties, flight crew members should be assessed on their crew resource management skills. The Captain, or co-pilot acting as the Captain, should also demonstrate his ability to "manage" the operation and take appropriate command decisions. When assessing crew resource management skills, the examiner should occupy an observer's seat.

9.1.5 When a flight simulator is used for proficiency training and checking, the opportunity should be taken, where possible, to use Line Orientated Flight Training (LOFT).

9.1.6 Emergency and safety equipment training should, as far as is practicable, take place in conjunction with cabin crew undergoing similar training, with emphasis on co-ordinated procedures and two-way communication between the flight deck and the cabin.

9.2

Periodic Competency Tests

9.2.1 The following is a full list of periodic competency training and tests which cover all Schedule 9 and 11 requirements, the results of which must be recorded on operators' forms:

(a)
proficiency check (includes the aircraft Rating and Instrument Rating);
(b)
line check;
(c)
instrument approach-to-land proficiency check, including low visibility operations procedures where applicable;
(d)
Captain's route and aerodrome competence;
(e)
handling recency;
(f)
safety equipment and procedures;
(g)
Crew Resource Management (CRM) training.

9.3

Proficiency Check (PC)

9.3.1 Although the PC is a test, it provides an opportunity for exercising emergency drills which rarely arise in normal operations. The statutory Schedule 9 requirement is that pilots are tested and their competence be verified and certified. The PC is undertaken in an approved flight simulator and shall include testing of the Aircraft Rating (AR) and Instrument Rating (IR) (Schedule 9) together with relevant Schedule 11 items including the Instrument Approach to Land (IAL). Both Certificates of Test for the aforementioned Schedule 9 items shall be signed on satisfactory completion of the PC. When a simulator is not available, the operator should propose to **CAD** a system for completing the PC. However, it is **CAD** policy that in this event, a flight simulator should be used for each alternating PC. An example PC form is included in Appendix E.

9.3.2 **PC – Initial.** Prior to commencing public transport Line Flying Under Supervision (LFUS), the operator must be assured that a pilot is competent and has reached the required standards during his conversion course. Therefore, there must be a valid PC form included within the pilots training file. The senior management signed competency statement on the PC form is the culmination of a pilot's conversion training and is verification that the type technical ground phase, simulator phase and the aircraft Base Training if applicable have been completed satisfactorily and tested accordingly. It is confirmation that training has been undertaken during the conversion for all Schedule 11 items as listed below in 9.3.5 (b) and that the pilot has demonstrated competence in the use of all IAL systems that could be encountered either at destination or alternate airports. In particular, if circling approach procedures are approved for use, then these must be covered and competence demonstrated during the conversion. In the case of pilots who are required to be qualified in both control seats, they must demonstrate competence in both seats (DCA528 boxed items).

9.3.3 **PC – Recurrent.** The recurrent PC is required for the testing of Schedule 9 and Schedule 11 items within the relevant period. Because the items listed in paragraph (b) below may be undertaken over a three year period, operators should structure the PC with a defined program of six PCs over a three year period. The "structured" PC can result in more efficient use of simulator time. For example, with agreement with the operator's FOI, practice of LVO failures and reversions may be spread over the three year period. The Aircraft Rating Renewal (ARR) is normally a manually flown exercise however, in one or two of the six PCs it should be undertaken making maximum use of the aircraft automation in accordance with company SOP. The AN(HK)O requires that a pilot is tested for the types of instrument approaches to be used at destination or alternate airfields. The IAL tests for VOR/DME, LOC only, ILS BB, ADF, GPS and circling approaches can be covered over the three year period. However, if an operator's route structure involves operations to airfields where it is likely that circling approaches will be required, it is **CAD** policy that they shall be tested on at least three occasions during the three year PC cycle. On satisfactory completion of the PC, senior management must sign the competency certificate accordingly.

9.3.4 The avoidance of Controlled Flight into Terrain (CFIT) must be briefed and considered throughout each PC. The crew's situational awareness and recognition of their responsibility for terrain clearance despite conflicting ATC instructions must be emphasized during both the departure and arrival phases of the flight. The additional threats imposed by non-precision approaches must be covered.

9.3.5 The scope of the practice and check may be divided into three categories, as follows:

(a)
Emergency manoeuvres in Instrument Meteorological Conditions (IMC) which must be carried out on each bi-annual check:

(i)
a take-off with engine failure between V_1 and V_2 or as soon as safety considerations permit. When the check is carried out in an aircraft, instrument flight conditions should be simulated as soon as possible after becoming airborne;

(ii)
a precision instrument approach to minima with one engine inoperative, followed by a missed approach;

(iii)
landing with one engine inoperative. For single-engined aeroplanes a practice forced landing is required;

(iv) where the emergency drills require action by the non-handling pilot, the check must also cover knowledge of such drills.

Note: When engine out manoeuvres are carried out in an aeroplane, the engine failure must be simulated.

(b)
Selected items from the following list should be covered on each PC, ensuring that all items are covered and recorded at least once within a three year period:

(i)
A rejected take-off (initiated at a speed no greater than 50% of V_1 when conducted in an aircraft);
(ii)
engine fire;
(iii) engine or propeller overspeed;
(iv) fuselage fire (pilot operated extinguishing system);
(v)
emergency operation of landing gear and flap;
(vi) pressurisation failure;
(vii) fuel jettison;
(viii) low fuel contents;
(ix) engine relight/restart;
(x)
hydraulic failures;
(xi) electrical failures;
(xii) engine and engine control malfunction;
(xiii) action following E/GPWS and TCAS warnings;
(xiv) action following predictive and windshear warnings;
(xv) pilot incapacitation - to be carried out annually;
(xvi) approach and landing with flying control or flight director system inoperative; and
(xvii) circling approaches.

Notes: 1. Some of the above items will need to be carried out by ‘touch drills’ and, if the check is carried out in an aircraft (rather than a simulator), they are normally best attended to on the ground.
2.
ACAS training for flight crew shall be established in accordance with ICAO Doc 8168 Part III Section 3 Chapter 3 and Attachment A.

(c)
A supplementary questionnaire on technical matters and operating procedures which, although not falling within the category of emergencies, are matters on which pilots should be tested at regular intervals. Typical items to be covered include:

(i)
recognition and diagnosis of aircraft system faults for which there are no set drills;

(ii)
radio failure procedures;
(iii) use of operations manuals, including Aerad/Jeppesen route guides;
(iv) familiarity with latest operations manual amendments, information circulars and aircrew instructions;
(v)
loading instructions;
(vi) knowledge of internal and external check lists;
(vii) aircraft equipment such as Flight Management System (FMS), navigation systems, E/GPWS, flight directors, weather radar etc;
(viii) noise abatement procedures;
(ix) precautions for winter operations, anti-icing procedures and operations from contaminated runways;
(x)
engine failure during stages of flight other than on take-off, especially critical phases such as noise abatement, a Standard Instrument Departure (SID) or over high ground or on approach;
(xi) wind shear recognition and avoidance.

NOTE: On most of the larger modern aircraft the list of items that might usefully be discussed is likely to be extensive and operators may prefer to deal with only a selection of items on a particular PC. In this event, a plan of items to be covered should be drawn up to ensure that all are dealt with over a three year period and records should be maintained accordingly. Some items may equally well be covered in the course of the line check. Advantage should also be taken of the opportunity to give pilots experience in the simulator of such rare occurrences as windshear, flapless landings and all engines out landings.

9.3.6 **Training Records**

9.3.6.1 An operator must ensure that flight crew are properly trained and tested in accordance with Schedules 9 and 11 of the AN(HK)O. It is therefore essential that proper, accurate and relevant records are kept of a pilot’s initial training and testing.

9.3.6.2 The training records must be kept in the pilot’s training file and securely retained in the operator’s training department.

9.3.6.3 Prior to operating a public transport flight, and commencement of LFUS, the records must show that a pilot has satisfactorily completed the appropriate approved ground and flight simulator course and if applicable aircraft base training. It therefore follows that a valid PC form shall be part of the training records. They must show that the pilot is properly licensed with a Group 1 or P2X endorsement on his Hong Kong License and that all Schedule 9 and 11 and **CAD** 360 requirements have been met including evidence of competence in AEP/SEPT, RVSM, LVO, GPS approaches, RNP and any special airspace qualification, CRM, route and airfield qualification.

9.3.6.4 Once a pilot commences LFUS, appropriate line sector records and the Final Line Check form must be in the training file.

9.3.6.5. After a pilot has completed his first recurrent PC, his conversion training records may be archived. However, the training file must always include a valid PC, Line Check and certificates to confirm qualification in accordance with Schedule 9 and 11 requirements.

9.3.6.5 It is acceptable to maintain all training records in an electronic format provided it is secure, with a satisfactory backup system and it has been agreed with **CAD**.

9.4

Proficiency Check – Cruise Only Co-Pilots (P2X)

9.4.1 P2X pilots must complete all Schedule 11 items for their respective aircraft types during the relevant period. In addition the Schedule 9 items namely the "boxed" items of the DCA 528 (AR) and the Instrument Rating (IR) must be completed to ensure that a P2X pilot is properly rated for his respective aircraft type(s). Both the AR and IR certificates are to be signed on satisfactory completion of the PC.

9.4.2 P2X pilots will not normally be exposed to aircraft handling below cruise altitude, therefore it is important that simulator training and refresher details cover all aspects of the normal and emergency operation of the aircraft.

9.4.3 Where an examiner judges the quality of any exercise to be only just acceptable, the operator should expose the subject to more frequent PCs and training. This is particularly true of young inexperienced pilots who may need reassurance that such training and checks are a normal part of operating life.

9.5

Line Checks - All Pilots

9.5.1 The annual line check is not intended to determine competence on any particular route. The requirement is for a test of ability to perform satisfactorily a complete line operation from start to finish, including pre-flight and post-flight procedures and use of the equipment provided. The route chosen should be such as to give adequate representation of the scope of a pilot's normal operations. The line check is considered a particularly important factor in the development, maintenance and refinement of high operating standards and can provide the operator with a valuable indication of the efficacy of his training policy and methods.

9.5.2 The operator has a statutory obligation to check that his pilots are competent to perform their duties. If it is company policy that both pilots may carry out either the handling or the non-handling duties, both Captains and co-pilots should be checked in both roles. Captains who also operate as co-pilots must be checked in both left and right hand seats.

9.5.3 In addition to the above duties, the flight crew should be assessed in CRM techniques, including command decision making. This is most readily achieved if the examiner occupies the jump seat.

9.5.4 When line checks are carried out on sectors which terminate away from base, the operator should allow for the possibility that on subsequent sectors the examiner may have to act as substitute for either the Captain or co-pilot. The examiner should therefore be fully qualified to operate at any crew station over which he acts in an examining capacity.

9.5.5 Line checks fall into two categories as follows:

(a)

FINAL line check: Following completion of route flying 'under supervision', a two sector line check, one handling and one non-handling (one combined sector for holders of P2X ratings) will be flown with a training captain at the controls. If successful, the 'under supervision' restriction is removed and re-certified as such on the candidate's records.

(b)

ANNUAL line check: This will normally take the form of a two sector line check, one handling and one non-handling check (one combined sector for holders of P2X ratings) and may be accomplished in one of two ways. Firstly, the training captain may occupy a seat at the controls and fly as Captain; secondly, he may occupy the jump seat and run a concurrent check on the operating crew (but see paragraph 9.5.6 below). He could not in this case be PIC. It should be noted that a Training Captain's Line Check must consist of a minimum of three sectors – one handling in each of the left and right seat and one non handling.

9.5.6 Should a pilot run out of check or fail a line check, he may not operate on a public transport flight except 'under supervision' until he is again fully qualified. All such supervised flying, and the line check required for requalification, requires a training captain to be at the controls.

9.6

Captains and Co-Pilots - Instrument Approach Proficiency

9.6.1 A further separate requirement to be met in respect of the Captain and copilot is that they must have been tested as to their proficiency in using instrument approach systems of the type in use at the aerodrome of intended landing and any alternate aerodrome; this will also include Low Visibility Operations (LVO) procedures, where applicable. The tests may be carried out in a flight simulator approved for the purpose. The instrument approach to land tests (non-LVO) may also be carried out in flight in actual or simulated IMC.

9.6.2 To comply with this requirement, operators may find it convenient to ensure that Captains and co-pilots are tested on their proficiency to carry out instrument approach procedures using all the pilot interpreted aids provided in the aircraft they operate. A separate test or record to cover the requirement may not be necessary, as it is possible to meet the regulation in the course of the bi-annual Proficiency Check by the inclusion of an NDB, VOR, GPS, LOC only or ILS Back Beam approach.

9.6.3 On suitable aircraft types where electronic instrumentation allows portrayal of both the NDB and the VOR angular deviation as either a needle or a beam bar presentation, the requirement for VOR and NDB can be combined and satisfied on conversion, provided the pilot has been tested performing one non-precision approach using a beam bar, and another using the needle.

9.6.4 The Constant Descent Final Approach (CDFA) is the preferred method for conducting a non-precision instrument approach. This technique should be utilised whenever possible in high performance transport aircraft as it is conducive to a stabilised approach and landing.

9.7

Captains - Route and Aerodrome Competence

9.7.1 An operator must ensure that the pilot designated as Captain of an aircraft has demonstrated to the operator's satisfaction adequate knowledge of the route to be flown and of the aerodromes (including alternates), facilities and procedures to be used. The period of validity of the route and aerodrome competence qualification is 13 months. However, the qualification may be re-validated during that period by operating on the route or to the aerodrome concerned.

9.7.2 Route competence training should include knowledge of:

(a)
terrain and minimum safe altitudes;

(b)
seasonal meteorological conditions;

(c)

meteorological, communication and air traffic control facilities, services and procedures;
(d)
navigational facilities associated with the intended route of flight;
(e)
search and rescue procedures.
9.7.3 Depending on the complexity of the route, as assessed by the operator, the following methods of familiarisation may be used:
(a)
for the less complex routes, familiarisation by self briefing with route documentation or by means of programmed instruction; and
(b)
for the more complex routes, in addition to (a) above, in flight familiarisation as a co-pilot, observer or Captain under supervision, or familiarisation in an approved flight simulator using a data base appropriate to the proposed route.
9.7.4 The operations manual should specify a method of categorisation of aerodromes and specify the qualification requirements for each of these categories. If the least demanding aerodromes are Category A, Category B and C should be applied to progressively more demanding aerodromes. The operations manual should specify the parameters which qualify an aerodrome to be considered as Category A and then provide a list of those aerodromes categorised as B and C.
9.7.5 All aerodromes an operator intends to use should be categorised in one of those three categories. Such categorisation must be acceptable to the Department and based on the following guide lines.
9.7.6 *Category A*. An aerodrome which satisfies all of the following requirements:
(a)
an approved instrument approach procedure;

(b)
at least one runway with no performance limited procedure for take-off and/or landing;
(c)
published circling minima not higher than 1000 feet above aerodrome level; and
(d)
Night operations capability.
9.7.7 *Category B*. An aerodrome which does not satisfy the Category A requirements or which requires extra considerations such as:
(a)
non-standard approach aids and/or approach patterns; or
(b)
unusual local weather conditions; or
(c)
unusual characteristics or performance limitations; or
(d)
any other relevant considerations such as obstructions, physical layout, lighting etc.
9.7.8 *Category C*. An aerodrome which requires additional considerations to a Category B aerodrome.
9.7.9 Prior to operating to a Category B aerodrome, a Captain should be briefed, or self

briefed by means of programmed instruction, on the Category B aerodrome(s) concerned and should certify that he has carried out these instructions.

9.7.10 Prior to operating to a Category C aerodrome, a Captain should be briefed and visit the aerodrome as an observer and/or undertake instruction in a flight simulator approved by the Department for the purpose. The instruction should be certified by the operator.

9.8

Recent Type Experience (Handling Recency)

9.8.1 A pilot whose Hong Kong Licence includes a valid and appropriate aircraft rating Certificate of Test for the aircraft type, and who has been certified by the said pilot's Hong Kong AOC operator as being competent to perform duties as commander or co-pilot shall have maintained take off and landing recency if within the 3 months, which immediately precedes the commencement of the public transport flight, the said pilot has completed a minimum of 3 take offs and 3 manual landings, in the aircraft of the type to be used on the flight. For revalidation of the 3-month take-off and landing recency, operators shall refer to Appendix F of this Chapter.

9.8.2 A Captain shall also have made, in the preceding 35 days, at least one complete flight involving one take-off and landing in an aircraft of the type to be used on the flight. In some cases, approved flight simulators may be used, but operators should consult their assigned Inspector before using flight simulators for this purpose. A Captain may revalidate his 35 day recency by carrying out a take-off and landing during a public transport flight provided he is not operating as Captain on that flight.

9.8.3 **Helicopter** pilots require 2 hours simulated or actual instrument flight in the preceding 60 days to achieve instrument recency; this may be extended to 90 days if the pilot has undergone, during the preceding 30 days, at least one hour in a simulator approved for the purpose of instrument rating renewal. Four approaches, appropriate to company operations, which may include flight simulator approaches in a simulator approved for instrument rating renewals, must be flown during the preceding 90 days.

9.8.4 Instrument rated helicopter pilots who are predominantly used on VMC operations require 2 hours simulated or actual instrument flight during the preceding 60 days; 2 instrument approaches during the preceding 60 days, which should include at least 1 instrument approach during the preceding 30 days.

9.9

Pilot Qualification for Operations in Either Seat

9.9.1 Pilot Flying duties (PF) including take offs and landings, may only be completed from the seat in which the PC was completed. Any Captain required to complete PF duties from the right-hand seat must complete additional training and testing as specified in **CAD** 360 and in the operator's training manual, concurrent with the operator's competency checks prescribed in Schedule 11. This additional training which normally will be conducted during the PC must include at least the following:

(a)
an engine failure during take-off;
(b)
a one engine inoperative approach and go-around; and
(c)
a one engine inoperative landing.

Note: The designated Captain for the flight will operate from the left-hand seat except when as a Training Captain he/she is required to conduct LFUS sectors from the right-hand seat.

9.9.2 When operating in the right-hand seat, the checks required by Schedule 11 for operating in the left-hand seat must, in addition, be valid and current.

9.9.3 A pilot relieving the Captain must demonstrate practice of drills and procedures, concurrent with the operator's competency checks prescribed in Schedule 11, which would otherwise have been the Captain's responsibility. Where the differences between left and right seats are not significant (for example because of use of autopilot) then practice may be conducted in either seat.

10

USE AND APPROVAL OF FLIGHT SIMULATORS AND TRAINERS

10.1 Provision is made in the AN(HK)O for use of apparatus such as flight simulators, flight trainers and fuselage 'mock-ups' for certain periodical tests. These devices must be individually approved by the Department and may be used only under the supervision of a person approved for the purpose. Approvals normally restrict the use of such devices to the particular company's own flight crews. Examiners' simulator authority extends only to the device(s) for which the company named on this authority holds a specific written approval.

10.2 All training staff should be instructed that training and checking exercises conducted in simulators and flight trainers should be treated from a flight safety aspect as if they were being carried out on an actual aircraft. Therefore, close adherence to established operating procedures and practices, particularly crew monitoring, call-outs and incapacitation procedures should be emphasised. Practising or continuing unsafe manoeuvres should be strongly discouraged.

10.3 Prior to each simulator session, examiners should check the serviceability in the technical log and the level to which the simulator is cleared, as it may change from time to time and at short notice. Additionally, a careful check should be made of the F528 attached to the approval document to confirm the simulator's validity for checks and tests.

11

GENERAL CONSIDERATIONS FOR TESTS

11.1 Any method of simulating instrument flight conditions for the purpose of testing pilots must be approved by the Flight Operations Inspectorate and, in the case of screens attached to the structure of the aircraft, approval must also be obtained from the Airworthiness Office of the **CAD**.

11.2 Instrument flight conditions may not be simulated on any flight for the purpose of public transport of passengers, nor may any emergency manoeuvres be simulated on such a flight.

11.3 Stopping of engines in flight should be subject to the recommendations and advice issued by the Department. Guidance can be obtained from the assigned inspector.

12

SAFETY EQUIPMENT AND PROCEDURES (SEP)

12.1 The purpose of emergency and survival training and testing is to provide flight deck crews with the necessary skills and knowledge to deal with different types of emergency and survival situations. A successful aircraft evacuation depends heavily on effective communications between the flight crew and the cabin crew.

12.2 Operators are to ensure that they have an established procedure for all flight deck crew to receive instruction on any new emergency and survival equipment that is introduced.

12.3 Operators may use either an aircraft or a 'mock-up' for emergency training and testing. Details regarding the approval of training apparatus and the approval of personnel responsible for conducting the training and testing on the equipment are contained in Chapter 6 'Emergency and Survival Training Practice and Testing Requirements for

Flight Crew and Cabin Attendants'.
12.4 Suitable training aids will facilitate the presentation of both classroom and practical sessions. Inspectors may wish to observe the training, practice and tests in progress.
12.5 Before flying training commences on an actual aircraft, flight crew are to complete successfully the training, tests and practice described in Chapter 6 which must have been certified in the trainee's records.

13
RECORDS OF TRAINING AND TESTS

13.1 Records showing a trainee's progress through each stage of training must be maintained. These should indicate the number of times each exercise in base and line training was covered and should include information about the results of tests. Records must incorporate certificates indicating the competence of examinees to perform the duties in respect of which they have been tested. Inspectors will advise operators on the form of records and certificates.
13.2 Operators must keep records for all aircraft flight crew members showing the dates on which tests, ratings, medical certificates, licences etc are all due for renewal. There should also be an effective system to guard against aircraft flight crews being rostered for duty, when checks etc are overdue, and for verifying that licences etc have been renewed at the appropriate time.
13.3 Where Schedule 9 and Schedule 11 tests are integrated as described in paragraph 4.2.2, the operator may use combined report forms subject to agreement of the format by the Department.
13.4 Records of all conversion courses and recurrent training and testing must be made available, on request, to the flight crew member concerned.
13.5 A person must be nominated as responsible for the maintenance of training records and be identified as such in the operations manual.
NOTE: A full list of Schedule 9 & 11 tests, their sources and periods of validity is at Appendix A to this Chapter.

14
RETRAINING AND RETESTING

14.1 Operators must ensure that training staff are adequately instructed on the action to be taken when unsatisfactory performance by a crew member, either during training or line operations, leads to retesting or further training. For example, following an unsatisfactory base check, a crew member should not be immediately subjected to a series of retests in the item(s) concerned until an acceptable standard is achieved. If the failure points to a fundamental weakness in ability or technique, adequate remedial training should be given before further testing.
14.2 If a crew member is found to be unsatisfactory during the course of line operations, the Captain should report the circumstances without delay and the crew member should be withdrawn from further duty until retraining and/or retesting has been carried out. A record should be kept of any action taken.

15

FLIGHT CREW CONVERSION TRAINING

15.1 **Syllabi**

All type conversion training should be conducted in accordance with detailed syllabi included in the training manual. The syllabi should be designed to reflect the experience level of the trainee. This could be low and therefore provision should be made to give sufficient training by allowing extra time, when necessary, to reach and maintain a safe operating standard. When considering programmes and syllabi for newly acquired aircraft types, operators are strongly urged to consult the Flight Operations Inspectorate at the outset. Early consultation will help to prevent difficulties and inconvenience to the operator.

NOTE: Amendments or additions to the training manual relating to training experience, practice and periodical tests on a newly acquired aircraft type must be submitted to the Department **before** the aircraft may fly for the purpose of public transport.

15.2 **Minimum Experience Requirements**

The minimum standards of qualifications and experience required of flight crews before being rostered for conversion training should be specified in the training manual.

15.3 **Ground Training**

15.3.1 Great importance is attached to technical training and there should be a properly organised programme of ground instruction by competent tutors with adequate facilities, including any necessary audio, mechanical and visual aids. If the aircraft concerned is relatively simple, private study may be adequate, if the operator provides suitable manuals and/or study notes. Inspectors will wish to examine premises and equipment to be used for ground training. They are also authorised to be present while tuition and lectures are in progress.

15.3.2 Courses of ground instruction for flight crews should incorporate written progress tests at the end of each distinct phase. Pilots, for example, should be examined on such matters as engines, airframes, flight director systems, radio and electrics, performance and flight planning, as each phase of ground training is completed.

15.3.3 For all flight crews, the ground course should include comprehensive instruction on the location and use of all emergency equipment carried in the aircraft and practice in the procedures for emergency evacuation, and procedures on taxi operations and active runway identification.

15.3.4 The annual 'emergency/survival' test detailed in Chapter 6 should be undertaken before any flying training is started.

15.3.5 Once an operator's conversion course has been commenced, a flight crew member should not undertake flying duties on another type or class of aircraft until the course is completed or terminated.

15.4 **Aircraft/Flight Simulator Training**

15.4.1 Flying training should be structured and sufficiently comprehensive to familiarise the flight crew member thoroughly with all aspects of limitations and normal/abnormal and emergency procedures associated with the aircraft, and should be carried out by suitably qualified TRIs and/or TREs. For specialised operations such as ETOPS, LVO or steep approaches, additional training should be carried out.

15.4.2 In planning training on aircraft types with a flight crew of two or more, particular emphasis should be placed on the practice of LOFT with emphasis on CRM.

15.4.3 Normally, the same training and practice in the flying of the aircraft should be given to co-pilots as well as Captains. The 'flight handling' sections of the syllabus for Captains and co-pilots alike should include all the requirements of the appropriate type rating tests together with the following items, if appropriate to the aircraft type. For co-pilots holding a P2X type rating whose duties are to be limited to 'cruise only', ie above FL 200, training is to be limited to an approved flight simulator.

(a) aeroplanes:

(i) visual circuits and landings by day and by night, including approaches without glideslope guidance and correction of displacement in azimuth and elevation on final approach;

(ii) visual 'go around' from not more than 200 ft agl;

(iii) engine failure before V_1;

(iv) take-off with engine failure between V_1 and V_2, or as soon as safety considerations permit;

(v) in instrument flight conditions with an outboard engine inoperative, a full manual ILS procedure, including a holding pattern, to decision height followed by a go-around;

(vi) landing with one engine inoperative;

(vii) landing with asymmetric reverse thrust;

(viii) failures of flight director system, including ILS approach without flight director;

(ix) a typical noise abatement procedure;

(x) approach to the stall and recovery, including operation of any stall warning devices and/or stick pusher;

(xi) emergency decent with and without use of autopilot;

(xii) automatic approach/landing training including disconnects at critical stages of approach and landing;

(xiii) use of autothrottle in manually controlled flight; and

(xiv) taxi operations and active runway identification.

(b) helicopters:

(i) practice of appropriate type rating test items under instrument flight conditions, including failure of flight instruments and flight directors;

(ii) recovery from unusual attitudes under instrument flight conditions.

15.4.4 Each exercise should be practised until a satisfactory standard is achieved. The various take-off, 'go-around' and landing exercises should be performed at least twice. Records kept by the operator should show the number of times that each exercise was covered. Unless the type rating training programme has been carried out in an appropriate flight simulator approved for zero flight time conversion, the training must include at least 3 take-offs and landings in the aircraft.

15.4.5 Particular emphasis should be placed on the practice of correct flight crew procedures for take-off, approach, landing and 'go-around' plus, for helicopter pilots, the

procedures for IMC descent en-route in conditions of low cloud and poor visibility.
15.4.6 Pilots undergoing conversion training should at some stage be given an exercise in coping with incapacitation of another flight crew member.
15.5 **Additional Requirements for Captains**
15.5.1 Without prejudice to any of the requirements of a particular type rating test, the conversion training of Captains should include the following items insofar as they may be appropriate to the aircraft type:
(a)
landing with two engines inoperative;
(b)
landing without flap/slat or with restricted flap;
(c)
landing with flying control system malfunction;
(d)
instrument approach and 'go-around' with flight director malfunction;
(e)
landing at night with one engine inoperative;
(f)
crosswind take-off and landing.
15.5.2 Captains must also be given practice in the stopping and starting of engines in flight and in any emergency drills that might fall to them while the co-pilot is handling the aircraft.
15.6 **Additional Requirements for Co-Pilots**
It is essential that co-pilots (in addition to the handling practice already referred to) should be given adequate training, during the simulator conversion course, in the execution of all emergency drills that might fall to them while the Captain is flying the aircraft. Co-pilots should also be given practice in the operation of aircraft systems and radio equipment normally managed by the co-pilot, while the Captain is handling the aircraft.

15.7 **Tests After Flying Training**
15.7.1 Before they are assigned to line duty (whether under supervision or not) all flight crew must be certified as competent by the operator in accordance with the requirements of Schedule 11 Part B of the AN(HK)O. Testing in these functions and duties **must not** be conducted in the course of normal operations. All conversion flying training must therefore incorporate a PC and an instrument approach-to-land PC before a flight crew member is assigned to line duty.
15.7.2 Before they are assigned to line duty all flight crew must complete LFUS and a line check on the new type. It is accepted, however, that this check could begin and end at the same aerodrome, may be of relatively short duration and may be made as part of the conversion training. It is essential, nevertheless, that pilots should demonstrate proficiency in the flight planning procedures for the new type, ability to operate in accordance with an IFR air traffic clearance whilst performing normal functions on the flight deck, as well as proficiency in the use of the installed radio and radar aids. Furthermore, all flight crew members must demonstrate their proficiency in operating the aircraft as both PF and PNF from the control seat in which they completed their PC. However, a Line Training Captain, need complete only one PNF sector. Following a satisfactory line check the operator must certify the pilot's competence, to operate as Captain or co-pilot.
15.8 **Line Flying Under Supervision (LFUS)**

15.8.1 For all aircraft conversion courses (non ZFT), the first LFUS flight must be within three months of the completion of the simulator course. Each flight crew member should operate a minimum number of sectors and/or flying hours under the supervision of a flight crew member nominated by the operator and acceptable to the Department.
15.8.2 The minimum sectors/hours should be specified in the operations manual and should be determined by the following:

(a) previous experience of the flight crew member;

(b) complexity of the aircraft; and

(c) the type and area of operation.

15.8.3 The 'under supervision' period should not be used for the completion of the basic conversion syllabus. Its purpose is twofold. Firstly, it will enable the newly converted crew member to settle down to his duties on the new type in the company of an experienced and suitably qualified crew member specially designated for the purpose and to turn to him for advice, if necessary. Secondly, it will enable the training staff to assess and verify the adequacy of the conversion training and to ensure that proper operating standards are achieved at the outset, in the course of normal and varied operations.

15.8.4 'Under supervision' means:

(a) for a Captain flying with an experienced pilot, qualified to act as the aircraft Captain and specially designated by the operator to act as a supervising pilot, who should occupy the seat and perform the duties of co-pilot. Some operators may wish the newly converted Captain to operate a few sectors in the co-pilot's seat; this is acceptable, if the supervising Captain is in the Captain's seat and the new Captain carries out the additional requirements detailed in paragraph 9.9 of this Chapter;

(b) for a co-pilot: flying in the co-pilot's seat with a qualified Captain, specially designated for the purpose, occupying the Captain's seat.

15.8.5 In some types of aircraft it may be necessary, while a co-pilot is flying his sectors under supervision, to carry a fully qualified co-pilot in addition. It must be clearly understood, however, that to meet the statutory requirements relating to the minimum flight crew to be carried, a pilot occupying the co-pilot's seat must be qualified for all the duties to be performed in that seat. As in the case of line checks, supervisory staff should be qualified to take over in any crew role over which they exercise supervision.
15.8.6 On completion of the sectors under supervision a further line check is to be administered. If no flying 'under observation' is required (see paragraph 15.8.7), successful completion of the line check and acceptance by the operator of such a check will release a pilot to the line. The subsequent rostering together of two newly qualified pilots should be avoided wherever possible.
15.8.7 The 'under supervision' sectors carried out by a newly qualified Captain will have been completed with an experienced supervisory Captain acting as co-pilot. Some operators may therefore wish to carry out a further period of flying under observation after the final line check, teaming the new Captain with a standard crew and with a suitably qualified pilot, specially designated for the purpose, occupying the jump seat and acting only in an advisory capacity. It should be made clear that in this situation the

newly qualified Captain is the Captain of the aircraft and will be certified as having passed a final line check. Similarly, operators may wish to consolidate a co-pilot's training subsequent to his final line check, by using a qualified supervisory co-pilot or Captain in the jump seat and a Captain who has passed his final line check as the Captain of the aircraft, in the left hand seat. To avoid confusion, all such flying should be called 'sectors under observation'. Before being released to the line, a post-observation check shall have been passed, and accepted by the operator.

15.8.8 Where the operator wishes to deviate from any of the minimum requirements in his training manual (perhaps because of a pilot's previous experience on type with another operator), this must not be authorised by the operator before consulting the Department In any such case, training documentation should be annotated accordingly.

15.9 **Cruise Relief Co-pilots (P2X - rated)**

15.9.1 Co-pilots trained only for relief duties in the cruise may occupy a control seat above FL200. Minimum training and checking requirements are as follows:

(a)
conversion training and checking should follow the syllabus for a co-pilot, but excluding take-offs and landings in an aircraft. The Form DCA 528 items for a P2X aircraft type rating should be completed.

(b)
recurrent training and checking should be as prescribed in Schedule 11, but excluding take-off and landing proficiency. The items for a P2X Certificate of Test should be completed.

(c)
Take-off and landing recency as prescribed in Schedule 11 is not required. The pilot must, however, carry out flight simulator recency and refresher flying skill training at intervals not exceeding 90 days. This refresher training may be combined with recurrent training if desired.

15.10 **Use of a Flight Simulator for Conversion Training**

15.10.1 The extent to which a flight simulator may be used for conversion training will be considered according to individual circumstances.

15.10.2 It is essential that there is commonality of instrumentation and controls between the aircraft and the flight simulator used for conversion and recurrent training and testing. Where differences exist they will be subject to an agreement between the operator and the Department.

15.11 **Variants of the Same Aircraft Type**

A company may operate a number of aircraft which, though of the same type, are not identical. They may differ in engines, systems, equipment, flight deck lay-out, operating procedures, performance or in other respects. In such circumstances the operator must conduct a 'differences course' for his crews to ensure they are adequately trained on each variant. Operators should consult their assigned Inspector for advice on the form and content of such a course.

16 UPGRADE TO CAPTAIN

16.1 An operator shall ensure that for upgrade from co-pilot to Captain and for pilots joining as direct entry Captains:

(a)
a minimum level of experience acceptable to the Department is specified in the operations manual;

(b)

for multi-crew operations, the pilot completes an appropriate command
course.
16.2 The content of the command course must be specified in the operations manual and should include at least the following:
(a)
flight simulator and/or flying training, including LOFT;
(b)
CRM training and Captain's responsibilities;
(c)
completion of an operator's PC acting as Captain;

(d)
line training in command under supervision. A minimum of 10 sectors is
required for pilots already qualified on aircraft type;
(e)
completion of a Captain's line check and route and aerodrome competence
qualifications.

17
BASE TRAINING REQUIREMENTS

17.1 Pilots undergoing CCQ conversion courses do not require ABT. In this case, the Blue DCA528 Form for Airbus "Family Aircraft" A320/330/340 CCQ Simulator Course shall be completed.
17.2 For non-CCQ conversion courses, the following Hong Kong Pilot Licence procedures will require ABT and the completion of the White DCA528 Form:
(a)
The initial application for a Hong Kong Professional Pilot's Licence;
(b)
P2X Upgrade to P1;
(c)
Application for an additional P1 aircraft rating in a Hong Kong Professional
Pilot's Licence; and
(i)
The aircraft type from which he is transferring ("the previous type")
and the aircraft type being applied are not of a "similar type".
(Aircraft types for which the Hong Kong AOC holder had **CAD**
approval for ZFT, are classified as "similar types"; or
(ii)
When the aircraft are of a similar type but:
(1)
The said pilot has less than 500 hours or less than 100 sectors
on the previous type; and/or
(2)
The said pilot has not retained recency in any Hong Kong
registered multi-engine turbojet aircraft for a period of 24
months or more.
17.3 For ZFT Simulator Conversion Courses, except as indicated in paragraphs 17.1 and 17.2 above, SBT is to be completed in accordance with the Yellow F528 Form.
Operators shall refer to Appendix C for detailed information and requirements on simulator conversion courses.
17.4 By achieving 3 take-offs and 3 landings in the aircraft, either during base training (as

required by paragraph 17.2 above) or during LFUS as permitted under paragraphs 17.1 and 17.3 above, the 3-month take-off and landing recency described in paragraph 9.8.1 of this Chapter is deemed to be established.

18 CREW RESOURCE MANAGEMENT (CRM) TRAINING

18.1 **General**

18.1.1 CRM is the effective utilisation of all available resources (e.g. crew members, aircraft systems and supporting facilities) to achieve safe and efficient operation. The objective of CRM is to enhance the communication and management skills of the crew member concerned. The emphasis is placed on the non-technical aspects of crew performance.

18.1.2 CRM training should include the following elements:

(a) statistics and examples of human factor related accidents;

(b) human perception, learning process, situational awareness;

(c) management of workload, tiredness or fatigue, and vigilance;

(d) management of stress;

(e) personality type, delegation, leadership, effective communication skills;

(f) the CRM loop (notion of synergy):
inquiry - advocacy - conflict resolution - decision making - critique - feedback;

(g) operator's standard operating procedures;

(h) effective communication and co-ordination within the crew, and between crew members and other operational personnel (air traffic controllers, maintenance personnel etc.);

(i) error chain and actions to break the error chain;

(j) implications of automation on CRM.

18.1.3 CRM training should also address the nature of the company's operations as well as the associated crew operating procedures. This will include areas of operations which present particular difficulties, adverse climatological conditions and any unusual hazards.

18.1.4 CRM training should include both classroom training and practical exercises including group discussions and accident reviews to analyse communication problems and instances of a lack of information or crew management.

18.1.5 Ideally, a CRM training course should last a minimum of 3 days, but, providing the whole syllabus is covered, a 2 day course is acceptable. An operator may use a course provided by another operator if that course is acceptable to the Department.

18.2 **Initial Conversion Training**
Operators should ensure that all flight crew complete a CRM course with a full length syllabus within 12 months of commencing airline operations. If a flight crew member undergoes a subsequent conversion course with the same or a change of operator he should complete the appropriate elements of the CRM course. The flight crew member should not be assessed either during or on completion of such a course.
18.3 **Recurrent Training**
18.3.1 Where an operator utilises LOFT in the recurrent training programme the flight crew member should complete elements of CRM training. Where an operator does not utilise LOFT, the flight crew member should complete elements of CRM training every year. The flight crew member should not be assessed.
18.3.2 An operator should ensure that flight crew members complete the major elements of the full length CRM course over a four year recurrent training cycle. This refresher training should not be assessed.
18.3.3 When a flight crew member undergoes an operator's competency check, line check or command course, then CRM skills should be included in the overall assessment.
18.4 **Combined Training**
18.4.1 Operators should, as far as is practicable, provide combined training for flight crew and cabin crew. There should be effective liaison between flight crew and cabin crew training departments, and provision should be made for flight and cabin crew instructors to observe and comment on each other's training.
18.4.2 The successful resolution of aircraft emergencies requires interaction between flight crew and cabin crew, and emphasis should be placed on the importance of effective co-ordination and two-way communication between all crew members in various emergency situations. Initial and recurrent CRM training should include joint practice in aircraft evacuation, so that all who are involved are aware of the duties other crew members should perform. When such practice is not possible, combined training should include joint discussion of emergency scenarios.
19
HELICOPTER PILOTS' PERIODIC TESTS
Cancelled – refers to CAD 360 Helicopter Supplement
20
FLIGHT OPERATIONS OFFICER / FLIGHT DISPATCHER
20.1 A flight operations officer / flight dispatcher should not be assigned to duty unless that officer has:
(a)
made within the preceding 12 months, at least a one-way qualification flight on the flight deck of an aeroplane over any area in which that individual is authorised to exercise flight supervision. The flight should include landings at as many aerodromes as practicable;

(b)
demonstrated to the operator a knowledge of:
(i)
the contents of the operations manual of the operator;
(ii)

the radio equipment in the aeroplanes used; and
(iii)
the navigation equipment in the aeroplanes used;
(c)
demonstrated to the operator a knowledge of the following details concerning operations for which the officer is responsible and areas in which that individual is authorised to exercise flight supervision:
(i)
the seasonal meteorological conditions and the sources of meteorological information;
(ii)
the effects of meteorological conditions on radio reception in the aeroplanes used;
(iii)
the peculiarities and limitations of each navigation system which is used by the operation; and
(iv)
the aeroplane loading instructions;
(d)
demonstrated to the operator knowledge and skills related to human performance relevant to dispatch duties; and
(e)
demonstrated to the operator the ability to perform the duties specified in ICAO Annex 6 Part I Para. 4.6.

20.2 A flight operations officer / flight dispatcher assigned to duty should maintain complete familiarization with all features of the operation which are pertinent to such duties, including knowledge and skills related to human performance.

20.3 A flight operations officer / flight dispatcher should not be assigned to duty after 12 consecutive months of absence from such duty, unless the provisions of para. 20.1 are met.

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CHAPTER 5 - APPENDIX A

SUMMARY OF TEST REQUIREMENTS

AN(HK)O - SCHEDULE 9

(LICENCES & RATINGS)

ITEM
REFERENCE
VALIDITY
NOTES
Instrument Rating

Certificate of Test
(Renewal)
PART C
para 3 & 4
13 Months
May be type specific.
Valid from date final item completed.
Refer **CAD** if expired more than 5 years.
Aircraft Type Rating
Certificate of Test
(Initial Grant)
PART C
para 3 & 4
6 Months
All F528 items within 6 month period.
Valid from date final C of T item complete.
Aircraft Type Rating
Certificate of Test
(Renewal)
PART C
para 3 & 4
*# 6 Months
F528 “Boxed items” only
Valid from date final item completed.
Refer **CAD** if expired more than 5 years.
Certificate of Experience
PART C
para 5 & 6
6 Months
(Aerial Work)
Signed by “Authorised Person”
Validity for PPL - 13 Months

AN(HK)O - SCHEDULE 11 (PUBLIC TRANSPORT)

ITEM
REFERENCE
VALIDITY
NOTES
Proficiency Check
(Pilots)
PART B
1(2)(a)(ii)
*# 6 Months
Valid from date first item completed.
Line Check
(Pilots)
PART B
1(2)(a)(i)
*13 Months
Initial check reqd before line flying.
Handling & Non-handling sectors.
Instrument Approach to
Land
PART B
1(2)(c)(i)
# 6 Months
May be combined with IR renewal test.
LVO procedures may also be required.
Commander’s
Route Competence
PART B
1(5)(a) & (b)
13 Months
Briefing, simulator or visit.
No formal test requirement.
Handling Recency

PART B
1(2)(c)(ii)
3 Months
3 Take-offs & 3 Landings.
In Approved Simulator by Exemption.
Safety Equipment
& Procedures
PART B
1(1)(a) & (b)
13 Months
Must be completed and certified prior to any
flying training.
Notes # Valid 13 months from date of first test, if 2 tests, separated by not less than 4 months, are conducted in the period.
* Tests alternate where Mixed Fleet Flying is approved on similar types.

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CHAPTER 5 - APPENDIX B

OPERATION ON MORE THAN ONE TYPE OR VARIANT

1.
Single Pilot

1.1
When a flight crew member operates more than one aeroplane class, type or variant, but not within a single licence endorsement, an operator must comply with the following:
A flight crew member shall not operate more than:
(a)
Three piston engined aeroplane types or variants; or
(b)
Three turbo-propellor aeroplane types or variants; or
(c)
One turbo-propellor aeroplane type or variant and one piston engined aeroplane type or variant; or
(d)
One turbo-propellor aeroplane type or variant and any aeroplane within a particular class.

1.2
All Schedule 9 and 11 requirements for each type or variant operated unless the operator has demonstrated specific procedures and/or operational restrictions which are acceptable to the Authority.

2.
Multi Pilot

2.1
When a flight crew member operates more than one aeroplane type or variant within one or more licence endorsements, an operator shall ensure that:

(a)
The minimum flight crew complement specified in the operations manual is the same for each type or variant to be operated;
(b)
A flight crew member does not operate more than two aeroplane types or variants for which a separate licence endorsement is required; and
(c)
Only aeroplanes within one licence endorsement are flown in any one flight duty period unless the operator has established procedures to ensure adequate time for preparation.
Note: In cases where more than one licence endorsement is involved, see sub-paragraphs 2.2 and 3.1 below.
2.2
When a flight crew member operates more than one aeroplane type or variant, but not within a single licence endorsement, an operator must comply with the following:
2.2.1 Subparagraphs 2.1(a),(b) and (c) above;
2.2.2 Before exercising the privileges of two licence endorsements:

(a)
Flight crew members must have completed two consecutive operator proficiency checks and must have 500 hours in the relevant crew position in commercial air transport operations with the same operator;
(b)
In the case of a pilot having experience with an operator and exercising the privileges of two licence endorsements, and then being promoted to command with the same operator on one of those types, the required minimum experience as commander is six months and 300 hours, and the pilot must have completed two consecutive operator proficiency checks before again being eligible to exercise two licence endorsements.
2.2.3 Before commencing training for and operation of another type or variant, flight crew members must have completed three months and 150 hours flying on the base aeroplane which must include at least one proficiency check.
2.2.4 After completion of the initial line check on the new type, 50 hours flying or 20 sectors must be achieved solely on aeroplanes of the new type rating.
2.2.5 Schedule 11 recency requirements for each type operated unless credits have been allowed by the Department in accordance with sub-paragraph 2.2.7 below.
2.2.6 The period within which line flying experience is required on each type must be specified in the operations manual.
2.2.7 Where credits are sought to reduce the training and checking and recent experience requirements between aeroplane types, the operator must demonstrate to the Department which items need not be repeated on each type or variant because of similarities.
(a)
Schedule 9 requires two operator proficiency checks every year. When credit is given in accordance with sub-paragraph 2.2.7 above for operator proficiency checks to alternate between the two types, each operator proficiency check revalidates the operator proficiency check for the other type. Provided that the period between Licence proficiency checks does not exceed that prescribed for each type, the above requirements will be satisfied. In addition relevant and approved recurrent training must be specified in the operations manual.
(b)

Schedule 11 requires one line check every year. When credit is given in accordance with sub-paragraph 2.2.7 above for line checks to alternate between types or variants, each line check revalidates the line check for the other type or variant.

(c)

Annual emergency and safety equipment training and checking must cover all requirements for each type.

2.2.8 Schedule 9 for each type or variant operated unless credits have been allowed by the Department in accordance with sub-paragraph 2.2.7 above.

2.3

When a flight crew member operates combinations of aeroplane types or variants (class - single pilot and type - multi pilot), an operator must demonstrate that specific procedures and/or operational restrictions are approved in accordance with Chapter 5 paragraph 8.

3.

Single Pilot and Multi Pilot

3.1

When a flight crew member operates more than one aeroplane type or variant, but not within a single licence endorsement, an operator must comply with:

(a)

Subparagraphs 2.1(a), (b) and (c) above;

(b)

Subparagraph 2.2 above.

4.

Helicopters

When a flight crew member operates more than one helicopter type or variant, an operator shall ensure that appropriate procedures approved by **CAD** are included in the company operations manual.

5.

Type conversion training

Once an operator's conversion course has been commenced, a flight crew member shall not undertake flying duties on another type until the course is completed or terminated.

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CHAPTER 5 - APPENDIX C

ZERO FLIGHT TIME - SIMULATOR CONVERSION COURSE

1.
This appendix is not applicable to conversion courses under Cross Crew Qualification CCQ arrangement.

2.
SBT will be conducted by an IRE/TRE qualified for SBT or ABT who must meet the qualification and recency requirements in accordance with paragraph 4.8 of this Chapter.

3.
SBT requires the candidate to complete a minimum of 6 satisfactory take-offs and 6 satisfactory landings in a level D simulator approved for the purpose. The examiner is to occupy the other control seat.

4.
SBT is to include the following:

(a)
Take-off rotation technique.

(b)
Approach to land, the landing flare, thrust reduction/reverse thrust technique and braking technique.

(c)
Cross wind and tail wind techniques for take-off and landing.

5.
On satisfactory completion of the SBT, the candidate proceeds to LFUS. This LFUS requires a IRE/TRE qualified for SBT or ABT to occupy the other control seat and the candidate must complete a minimum of 4 sectors which include a minimum of 3 satisfactory take-offs and landings and 1 Pilot Monitoring (PM) sector.

6.
The first take-off and landing must be completed within 21 days of completion of the SBT. The remaining take-off and landing manoeuvres, as stated in paragraph 5 above, shall be completed within 3 months of the completion of the SBT.

7.
In the event of an unsatisfactory take-off or landing at any time during the LFUS, the candidate must immediately revert to PM duties only. On return to Base the said pilot shall fulfill, as a minimum, the following, or as additionally recommended by the Training Captain:

(a)
Either completes a minimum of 6 satisfactory take-offs and landings in a level D simulator approved for SBT, or a minimum of 3 satisfactory take-offs and 3 satisfactory landings in ABT. All the aforementioned take-offs and landings are to be under the supervision of a IRE/TRE qualified for ABT.

(b)
Completes the LFUS requirements as per paragraph 5 of this Appendix, except under the supervision of a IRE/TRE qualified for ABT, and the LFUS sectors shall be completed within 3 months of the completion of the SBT or ABT referred to in sub-paragraph (a) above.

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Air Operator's Certificate
CAD 360
Operation of Aircraft
Part ONE
January 2009 (Amdt 26)
Chap 5/43

Chapter 5 - APPENDIX D
HELICOPTER PILOT'S NIGHT QUALIFICATION CHECK (NQC)
Cancelled – refers to CAD 360 Helicopter Supplement

CAD 360
Air Operator's Certificates
Part ONE
Operation of Aircraft
Chap 5/44
January 2009 (Amdt 26)

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Air Operator's Certificate
CAD 360
Operation of Aircraft
Part ONE
August 2011 (Amdt 32)
Chap 5/45

CHAPTER 5 - APPENDIX E
Sample Form for Proficiency Check

AIRLINE
:
AIRCRAFT TYPE
:
CANDIDATE
NAME
:
SIMULATOR CODE /
AIRCRAFT REGISTRATION :
DATE
:
AUTHORISED EXAMINER :
PROFICIENCY CHECK NUMBER:
1
2
3
4
5
6
3 Year Rotation

ASSESSMENT
Satisfactory
(SAT)
Unsatisfactory
(UNSAT)
Retest
(SAT / UNSAT)

Instrument Rating
Pre-departure Checks / Use of Checklists:
Take Off / SID:
Enroute:

Hold:
ILS / MAP:
Aircraft Rating – LHS / RHS
LHS RHS
LHS RHS
V1 Cut:
ILS Approach (one engine inop):
MAP (one engine inop):
Land (one engine inop):
Note: When engine out manoeuvres are carried out in an aeroplane, the engine failure must be simulated.
Non Precision Approach / IAL:
LVO Procedures:
General
Automation Management:
Normal Procedures:
Non Normal Procedures:
PNF Duties:
TEM / CRM:
Items in accordance with CAD 360 Part One Chapter 5 Paragraph 9.3.5(b)

Remarks:
Submission Details
Management Confirmation
Examined By:
Confirmed
By:
I certify that ______________________________
____
has passed the Proficiency Check.
(1) Considering this and previous reports, I certify that
____
is competent to perform the duties of
Capt*/FO*/SO*.
Signed:
Signed:
ATPL No:
Rank / Post:
Date:
Date:
* Delete as appropriate
Notes:
(1)
For the initial PC this statement may also apply to Aircraft Base Training.
(2)
The above 'signature blocks' are also required for the company Annual Line Check Form.

Chap 5/47

CHAPTER 5 – APPENDIX F

REVALIDATION OF THE 3-MONTH TAKE OFF AND LANDING RECENCY

1.
If the pilot has not maintained **TAKE OFF and LANDING RECENCY for a period of SIX MONTHS OR LESS** then the said pilot's recency may be re-validated by completing the following:

(a)
Completes a minimum of THREE satisfactory take offs and a minimum of THREE satisfactory landings(1) in a Simulator(2) and (3), or a minimum of THREE satisfactory take offs and a minimum of THREE satisfactory landings in ABT, either being within the period of THREE months which immediately precedes the commencement of the public transport flights.

(b)
The said pilot is accompanied by a Line Training Captain at the flying controls for the purpose of LFUS for the first take off and landing(1) and (5).

(c)
Completes a minimum of THREE take offs and a minimum of THREE landings in the aircraft(4) on Line Flying.

2.
If the pilot has not maintained **TAKE OFF and LANDING RECENCY for a period EXCEEDING 6 MONTHS BUT LESS THAN 12 MONTHS**, then the said pilot's recency may be re-validated by completing the following:

(a)
Minimum one familiarization session in a simulator.

(b)
One Recurrent Training (RT) simulator session.

(c)
PC.

(d)
Completes a minimum of SIX satisfactory take offs and a minimum of SIX satisfactory landings(1) in a simulator(2) and (3), or a minimum of THREE satisfactory take offs and a minimum of THREE satisfactory landings in ABT, either being within the period of THREE months which immediately precedes the commencement of the PTF and under the instruction of a Training Captain authorised to conduct SBT or ABT respectively.

(e)
The said pilot is accompanied by a Line Training Captain at the flying controls for the purpose of LFUS for a minimum of THREE take offs and a minimum of THREE landings(1), (4), (5) and (6).

3.
If a pilot has not maintained **TAKE OFF and LANDING RECENCY for a period of 12 MONTHS BUT LESS THAN 24 MONTHS**, then the said pilot's recency may be re-validated by completing the following:

(a)
Sufficient simulator sessions to ensure that the pilot has completed within his 3-year cycle the items as stated in **CAD** 360 Part One Chapter 5 paragraph 9.3.5(b).

(b)

Items indicated at paragraphs 2(a), (b), (c) and (d) above.
(c)
The said pilot is accompanied by a Training Captain, authorised to conduct SBT or ABT, at the flying controls for the purpose of LFUS for a minimum of THREE take offs and a minimum of THREE landings(1), (4), (5) and (6).
(d)
Sufficient Aircraft LFUS to complete the Annual Line Check.
4.
If a Pilot has not maintained **TAKE OFF and LANDING RECENCY for a period of 24 MONTHS OR MORE** then the pilot will be required to complete ABT in addition to the relevant items required by paragraph 3.

Notes: (1)
A satisfactory take off or satisfactory landing in the simulator or aircraft means the candidate was in full control at all times and without major prompting or physical input to the flying controls or thrust levers by the Training Captain.
(2)
Simulator means a 'simulator so approved'.
(3)
The minimum specified take offs and landings in the simulator shall be completed in 'real time' between each take off and subsequent landing.
(4)
The three take offs and three manual landings in the aircraft are to be completed within THREE MONTHS of the completion of the simulator or ABT sessions.
(5)
One unsatisfactory take off or landing in the aircraft shall necessitate the termination of all further take offs and landings and the pilot concerned shall revert to PM duties only. On return to Base the said pilot shall complete as a minimum the requirements as outlined in paragraphs 2(d) and 3(c) above, or as additionally recommended by the Training Captain.
(6)
The LFUS shall consist of a minimum of 4 LFUS sectors to include the three take offs and three landings and one Pilot Monitoring (PM) sector.

CHAPTER 6 - EMERGENCY AND SURVIVAL TRAINING, PRACTICE AND TESTING REQUIREMENTS FOR FLIGHT CREW AND CABIN CREW

1
GENERAL REQUIREMENTS

1.1
Statutory Requirements
Statutory requirements relating to the training and periodical testing of crews are prescribed in the Air Navigation (Hong Kong) Order (AN(HK)O).
The primary purpose of this chapter is to indicate the nature of arrangements considered necessary to secure an adequate standard of compliance with the statutory provisions.
Requirements for cabin crew acting as members of the crew of business jet / general aviation flights are to be found in Appendix B of this chapter.
1.2

Crew Co-ordination and Combined Training

1.2.1 The successful containment of aircraft emergencies depends heavily upon effective co-ordination and two-way communication between flight crew and cabin crew.

1.2.2 Operators are expected to make every effort to provide combined training for flight crew and cabin crew. Much of the training that both must receive prior to operating public transport aircraft covers common ground; paragraphs 3 (Initial Training) and 4 (Aircraft Type Training) of this Chapter specify training that all crew members must be given.

1.2.3 Additional training that cabin crew must receive is listed in paragraphs 6 and 7. Flight crew should be made aware of such additional training as is provided to cabin crew in compliance with this requirement.

1.2.4 Particular emphasis should be placed on the provision of joint practice in aircraft evacuations so that all who are involved learn of the duties other crew members must perform before, during and after the evacuation, thereby appreciating the necessity for effective two-way communications in such an emergency.

1.2.5 When combined training cannot be arranged, an operator's instructor should adopt the role of flight crew or cabin crew, as appropriate.

1.2.6 To facilitate training, it is essential that there is effective liaison between flight crew and cabin crew training departments; to promote consistency of drills and procedures, provision should be made for flight crew instructors to observe and comment on cabin crew training and vice versa.

1.3

Training Syllabus

A detailed emergency and survival training and testing syllabus is to be specified in the training manual. The syllabus should differentiate between initial training, aircraft type training, the annual emergency survival test and three yearly practice. The training programme shall be stated and approved by **CAD**.

1.4

Training Staff and Examiners

1.4.1 A suitably qualified person should be appointed to manage cabin safety training and testing; additionally instructors and examiners will need to be appointed to provide instruction, supervise practice and conduct tests. The practical training must be under the supervision of an instructor who has the knowledge, ability and experience to conduct such training. Details of all such appointments should be sent to the **CAD** not more than 14 days after the appointment becomes effective.

1.4.2 A training instructor should have a minimum of one year experience as a crew member or previous experience as safety training instructor. A training examiner should be an instructor who has an in-depth knowledge on the operator's training standards and requirements.

1.4.3 A person without the experience in as stipulated in 1.4.2 may still be considered for appointment provided adequate training and exposure to operational duties are given.

1.4.4 The training personnel conducting the instructor training must have current knowledge, ability and recent experience as an instructor and examiner. The appointment of these training personnel shall be subject to the approval of the Authority.

1.4.5 A safety Instructor / Examiner is required to:

(a)

be checked by a **CAD** inspector or an appointed operator's examiner every 36 months on their competency as instructor and/or examiner;

(b)

carry out a minimum of three observation flight sectors on the operator's flight
within the last 36 months.
1.4.6 An operator is required to maintain the following records of their instructors and examiners:
(a)
training records;
(b)
training classes conducted;
(c)
examinations conducted;
(d)
observation flights;
(e)
checks as carried out by **CAD** inspector or an examiner appointed by **CAD**.
1.5
Training and Approved Instructors and Examiners
1.5.1 Training programme for cabin crew instructors and examiners should be submitted by operator to the Authority for approval. The application should include the qualifications, experience requirements, and the proposed training programme.

1.5.2 To conduct emergency procedures training, the cabin crew instructor and examiner needs to demonstrate a wide range of skills and knowledge to be able to train cabin crew and to be able to assess their competency regarding regulatory requirements and their airlines approved training course.
1.5.3 Additionally, an instructor and examiner may well be required to train crew in several different teaching environments, including classroom, evacuation trainer, swimming pool, door trainer and aircraft. This will require a high degree of subject knowledge, instructional skills, communication skills and people management skills to be demonstrated.
1.5.4 The competency of an instructor and examiner should ensure sufficient specific competencies that all cabin crew instructors and examiner should possess, regardless of the nature of their operations. This would include a complete assessment of the following:
(a)
Instructional Techniques – Classroom instruction and conducting of exams
(b)
Instructional Techniques – Practical exercises, demonstration and assessment
(c)
Subject knowledge
(d)
Leadership / People Skills
(e)
Course Administration
1.5.5 The conduct of crew training and of tests carried out by operators' instructor and examiner to be approved by **CAD** will be observed by appropriately qualified Inspectors to ascertain their competency.
1.5.6 An operator shall ensure that initial training (and refresher training at regular interval will be provided for each cabin crew instructor which includes at least the following:
(a)
Pedagogy course;

(b)
Cabin Crew Induction course; and
(c)
Cabin Crew Conversion and Annual Emergency Procedure Course.
1.6
Records of Training and Tests - Emergency and Survival
1.6.1 Records must be maintained to show trainees' progress through each stage of training and include information about the results of tests. Records should incorporate certificates indicating the competence of trainees to perform the duties on which they have been tested. Inspectors will advise operators on the form of records and certificates,
1.6.2 Operators must keep records for all crew members to show when practices and tests are due for renewal. There should also be an effective system to guard against crews being rostered for duty when practices and tests are overdue. The annual emergency survival test is valid for 13 months.

1.6.3 Records of all initial, conversion and recurrent training and testing must be made available, on request, to the cabin crew member concerned.
1.7
Use and Approval of Aircraft Emergency Training Apparatus
1.7.1 Provision is made in the AN(HK)O for use of 'mock ups' for certain periodical tests. These devices must be individually approved for test purposes and may be used for such purposes only under the supervision of a person approved for that purpose. Approvals normally restrict the use of such devices to the particular operator's crews.
1.7.2 Details regarding the approval of training apparatus and the approval of personnel responsible for conducting the training and testing on this equipment are contained at paragraph 9 of this Chapter.
2
PURPOSE AND PROVISION OF TRAINING
2.1
Applicability
The requirements of this Chapter are applicable to all operating flight crew and cabin crew carried on board an aircraft.
2.2
Purpose
The purpose of emergency and survival training, practice and testing is to provide crews with the knowledge, skills and confidence needed to ensure that they deal efficiently with different types of emergency and survival situations.
2.3
Arrangements
Operators are to ensure that organised courses of instruction are given by designated instructors on the use of all emergency and survival equipment, and on all emergency procedures and drills, including aircraft emergency evacuation.
2.4
Cabin Crew - Service Duties
Cabin crew should also receive instruction in their normal flying duties, including the location and use of all cabin and galley equipment.
2.5
Training Aids
Suitable training aids will enhance the presentations in both classroom and practical

instruction sessions.
2.6
First Aid Training
First aid training is to be given only by instructors qualified for the purpose. In case of doubt about the adequacy of an instructor's qualifications the **CAD** should be consulted. Training is to be followed by the successful completion of the appropriate first aid test.

2.7
Before Flying on Aircraft
Before flying training commences on an actual aircraft, flight crew are to complete successfully the training, practice and tests described in paragraphs 3 and 4 of this Chapter.
2.8
Supernumerary Flying
A later stage of aircraft type training will include cabin crew flying in a supernumerary role on a passenger flight. Passengers may not be able to distinguish between such trainees and fully trained cabin crew and in an emergency may expect to receive guidance and assistance from anyone wearing a crew uniform. Operators must therefore ensure that before undertaking supernumerary duties cabin crew have successfully completed the training and testing specified in paragraphs 3, 4, 6 and 7 of this Chapter.
2.9
Introduction of New Equipment
Operators are to ensure that they have an established procedure for all crew to receive training and practice on any new emergency and survival equipment that is introduced.
2.10 **Inspectors**
Inspectors may wish to observe the training, practice and tests in progress.
3
INITIAL TRAINING - ALL CREW
3.1
Introduction
Crew are to be trained in the following subjects which are of a general nature and not necessarily related to a specific aircraft type.
3.2
Crew Co-ordination
Emphasis is to be placed on the importance of effective co-ordination and two-way communication between flight crew and cabin crew in various emergency situations. Cabin crew should be trained to be alert, and to identify unusual situations that might occur inside the passenger compartment, as well as any activity outside the aircraft that could affect the safety of the aircraft or its occupants. The need for effective communication of accurate information between flight crew and cabin crew must be stressed.
3.3
Aeromedical and First Aid Topics
3.3.1 Instruction should be given on aeromedical topics such as:
(a)
first aid subjects appropriate to the aircraft type, ie its size and the number of flight crew carried;

(b)
guidance on the avoidance of food poisoning, with emphasis on the choice of a pre-flight meal and the importance of the commander and co-pilot eating different food at different times during the flight, especially on long sectors;
(c)
the possible dangers associated with the contamination of the skin or eyes by aviation fuel and other fluids and their immediate treatment,
(d)
the recognition and treatment of hypoxia and hyperventilation; and
(e)
first aid associated with survival training, appropriate to the routes operated.

3.3.2 Flight crew who operate on aircraft where cabin crew are not carried should undertake training in basic first aid that is to include the use and contents of first aid kits, and in cardiopulmonary resuscitation.

3.4
Fire and Smoke Training

3.4.1 Practical fire and smoke training must be under the supervision of an instructor who has the knowledge, ability and experience to conduct such training. Operators who have difficulty in providing the necessary facilities in respect of fire training and testing can approach the Inspectorate for assistance .

3.4.2 Both theoretical and practical training should be given. This is to include:
(a)
an appreciation of the chemistry of fire as a preliminary to consideration of the choice of extinguishing agents for particular fire situations, the techniques of applying extinguishing agents, the consequences of misapplication and their use in a confined space;
(b)
a demonstration or film of fire extinguishers being used on various types of fires. Fires should be related to typical aircraft interior equipment and include galley fires, fire in toilets, upholstery, passenger service units and electrical installations.

3.5
Water Survival Training

3.5.1 Where flotation equipment is carried, a comprehensive wet drill to cover all ditching procedures must be practised by aircraft crew. This wet drill is to include, as appropriate, practice of the actual donning and inflation of a life-jacket, together with a demonstration or film of the inflation of life-rafts and/or slide-rafts. Crews must board the same (or similar) flotation equipment from the water whilst wearing a life-jacket. Training must include the use of all survival equipment carried on board flotation equipment and any additional survival equipment carried separately on board the aircraft.

3.5.2 Operators conducting intensive offshore helicopter operations will need to repeat wet drills every 2 years. Consideration should be given to the provision of further specialist training such as underwater escape training.

NOTE: Wet drill practice is always to be given in initial training, unless the crew member concerned has received similar training provided by another operator and such an arrangement is acceptable to the current employer.

3.6
Survival Training
Operators are to provide survival training, including the use of any survival equipment carried, appropriate to their areas of operation e.g. polar, desert, jungle or sea.

3.7
Human Factors
Training should address the physiological effects on the human body of flying, the problems associated with pressure change and hypoxia and the need for restrictions on underwater diving. Training should include information on flight time limitations, the effects of operating for extended periods of time and the effects of time zone changes. Operational limitations should include illness, use of alcohol and drugs, blood donations etc. Advice should be given on general health care, especially whilst operating overseas, and the need for preventative medicine such as immunisation, when operating to potentially infected areas.

3.8
Aerodrome Emergency Services
The operational procedures of ground-based emergency services at aerodromes should be discussed.

3.9
Aviation Security
Training is to be given in aspects of aviation security listed in Appendix A to this Chapter.

4
AIRCRAFT TYPE TRAINING - ALL CREW

4.1
General
Operators should ensure that comprehensive training is given on the location and use of all emergency and survival equipment to be carried on the aircraft, and that all training is related to the aircraft type, series and configuration to be operated. Aircraft type training must be given to all newly employed aircraft crew and to those who are converting to a new aircraft type.

4.2
Emergency and Survival Equipment
Training must be given in the location and use of all emergency and survival equipment together with the relevant drills and procedures. The following equipment must, if carried on board, be included:

(a)
emergency exits;

(b)
escape slides and, where non-self supporting slides are carried, the use of any associated ropes;

(c)
life-rafts and slide-rafts, including the equipment attached to and/or carried in the raft;

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(d)
life-jackets, infant life-jackets and flotation cots;
(e)
drop-out oxygen and its manual deployment;
(f)
emergency and therapeutic oxygen;
(g)
protective breathing equipment and protective clothing;
(h)
fire extinguishers;
(i)
fire axes;
(j)
portable lights, including torches;
(k)
emergency lighting systems, including floor proximity lighting systems;
(l)
communications equipment, including megaphones;
(m) survival packs, including their contents;
(n)
pyrotechnics;
(o)
first aid kits and their contents;
(p)
toilet compartment smoke detector systems;
(q)
evacuation alarm systems; and
(r)
non-mandatory or special equipment fitted or carried.
4.3
Fire Training
Training must be given in extinguishing a fire, representative of an interior aircraft fire using the relevant type of fire extinguisher carried on the aircraft. Emphasis is to be placed on the characteristics of different types of extinguishers, including their effective range and duration and the effectiveness of their use on differing types of fires.
4.4
Protective Breathing Equipment and Protective Clothing
On aircraft types in which it is provided, crews must be trained in the use of protective breathing equipment and protective clothing. Donning and wearing of such equipment and clothing should be practised in an enclosed, simulated smoke-filled environment.

5
RECURRENT TRAINING - ALL CREW
5.1
Refresher Training
Operators must ensure that an annual organised course of refresher training is provided for their crews; this training should prepare them for the emergency survival test. Such training will have the additional advantage of allowing crews to discuss recent

incidents, difficulties and emergencies which have been experienced. If none have arisen, operators should discuss possible scenarios with emphasis on what actions should be taken. Time must be allocated for this purpose. This discussion is particularly important when cabin crew are assigned to more than one type of aircraft. First aid and aviation security refresher training must also be included (see also Appendix A).

5.2

The Annual Emergency Survival Test

5.2.1 The AN(HK)O requires that all crew shall be tested on aspects of emergency and survival appropriate to the aircraft type to be operated. The maximum period of validity of this test is 13 months. Schedule 11 makes a distinction between tests and practice, and operators should apply a similar distinction in their crew training records.

5.2.2 All crew must pass a test on their knowledge of the location and use of emergency survival equipment, and the appropriate drills and procedures. The test will be related to the aircraft type and cover every series and configuration. Appropriate written tests are required and must include first aid topics.

5.2.3 To demonstrate their proficiency in carrying out emergency duties, crew should practice - insofar as it is practicable and reasonable to do so - the actual movements and operations assigned to them in evacuation and other emergency drills. The donning of life-jackets, oxygen masks and protective breathing equipment and touch drills for opening emergency exits should be included

5.3

Periodic Practice

Once every 3 years aircraft crew are to carry out the following practice:

(a)
the operation and actual opening of all normal and emergency exits used for passenger evacuation;

(b)
extinguishing a fire, representative of an aircraft interior fire, with each type of fire extinguisher carried on board the aircraft except that, in the case of Halogen extinguishers, an alternative extinguishing agent may be used; and

(c)
the donning and use of protective breathing equipment by each crew member in an enclosed, simulated smoke-filled environment.

6

INITIAL TRAINING - ADDITIONAL ITEMS FOR CABIN CREW

6.1

General

Cabin crew are to be trained in the following subjects which are of a general nature and not necessarily related to a specific aircraft type.

6.2

Discipline and Responsibilities

Operators must ensure that during cabin crew initial training, the following items are included in the cabin crew training syllabus:

(a)
the importance of performing their duties in accordance with the operations manual;

(b)
maintaining competence and fitness to operate as a cabin crew member with

special regard to flight and duty time limitations and rest requirements;
(c)
aviation regulations relating to cabin crew and the role of the **CAD**;
(d)
the effects on the aircraft's flight path resulting from a significant redistribution of passengers in flight;
(e)
basic aircraft icing, types of icing, the effects of icing on ground and in-flight operations and how to identify aircraft icing when viewed from the cabin;
(f)
pre-flight briefing of cabin crew and the provision of necessary safety information with regard to their specific duties;
(g)
the importance of ensuring that relevant documents and manuals are kept up to date with amendments provided by the operator;
(h)
the importance of identifying when cabin crew members have the authority and responsibility to initiate an evacuation and other emergency procedures; and
(i)
the importance of safety duties and responsibilities, and the need to respond promptly and effectively to emergency situations.

6.3
First Aid

Instruction should be given on first aid and the use of first aid kits, together with the application of any drugs. The following subjects should be covered:
(a)
haemorrhage;
(b)
wounds;
(c)
fractures, including dislocation and sprains;

(d)
burns;
(e)
care of the unconscious;
(f)
shock;
(g)
heart attacks;
(h)
stroke, epilepsy, diabetes;
(i)
artificial respiration and cardiopulmonary resuscitation;
(j)
use of therapeutic oxygen and oxygen sets;
(k)
poisoning;
(l)

emergency childbirth;
(m) choking;
(n)
stress reactions and allergic reactions;
(o)
air sickness; and
(p)
asthma.
NOTE: In order to complete satisfactory practical training in artificial respiration and cardiopulmonary resuscitation, cabin crew must use a dummy specifically designed for the purpose.
6.4
Fire and Smoke Training
It is particularly important that cabin crew should be given theoretical and practical training in dealing with emergency situations involving fire and smoke in the cabin. The training is to include:
(a)
the responsibility of cabin crew to deal promptly with emergencies involving fire and smoke. Emphasis should be placed on the importance of identifying the actual source of the fire;
(b)
the importance of informing the flight crew immediately fire or smoke is discovered and of keeping them informed as the situation develops. The importance of crew co-ordination and communication is to be emphasised, together with an established procedure for communicating with the flight deck;
(c)
the importance of ensuring that passengers are aware of no smoking areas and obey no smoking signs. Emphasis is to be placed on the frequent and systematic checking of toilets (including smoke detectors) and other areas which are not part of the seating accommodation;
(d)
a demonstration or film is required of fire extinguishers being used on various types of fires. Fires are to be related to typical aircraft situations including fires in galleys, toilets, upholstery, passenger service units and electrical installations.

6.5
Abusive Passengers
Operators are to give advice to cabin crew on the management of passengers who become abusive; this often arises from excessive consumption of alcohol or the effects of medication/drugs, or a combination of both.
6.6
Seat Allocation
Cabin crew are to be given training on the importance of correct seat allocation with particular emphasis on the seating of disabled passengers and the necessity of seating able-bodied passengers adjacent to unsupervised exits.
6.7
Prohibited Items and Dangerous Goods (DG)
Cabin crew should be given training in aspects of the carriage of prohibited items and DG. DG training must comply with the requirements specified in the current edition

of the ICAO Technical Instructions for the Safe Transport of Dangerous Goods by Air.
6.8
Flight Time Limitations
Cabin crew must be made familiar with the company flight time limitations scheme and the statutory requirements regarding crew fatigue.
6.9
Crew Resource Management (CRM) Training
6.9.1 Operators must provide initial and recurrent CRM training for all cabin crew. Cabin crew training should be combined, as far as practible, with flight crew training, to promote awareness of flight crew management of various emergency situations and the consequential effects on aircraft operation.
6.9.2 Combined training should include practice in aircraft evacuation and joint discussion of emergency scenarios. Wherever practible, SCCMs should participate in flight simulator Line Orientated Flying Training (LOFT) exercises.
6.9.3 Emphasis should be placed on the importance of effective co-ordination and two-way communication between flight and cabin crew in various abnormal and emergency situations. Emphasis should also be placed on co-ordination and communication within the crew in normal operational situations including the use of correct terminology, common language and effective use of communications equipment.
6.9.4 Cabin crew should be trained to identify unusual situations that might occur inside the passenger compartment, as well as any activity outside the aircraft that could affect the safety of the aircraft and/or passengers.
6.9.5 There should be effective liaison between flight and cabin crew training departments, and provision should be made for flight and cabin crew instructors to observe and comment on each others' training.

6.10 **Senior Cabin Crew Member (SCCM) Training**
Senior Cabin Crew Members should be given additional training on the following topics:
(a)
items to be covered at pre-flight briefing of the operating cabin crew including:
(i)
allocation of cabin crew stations and responsibilities;
(ii)
aircraft type and equipment fit;
(iii) area, route and type of operation e.g. ETOPS; and
(iv) any special category passengers such as infants, disabled or stretcher cases etc.
(b)
co-operation within the crew:
(i)
discipline, responsibilities and chain of command;
(ii)
importance of co-ordination and communication; and
(iii) action in the event of pilot incapacitation.
(c)
review of legal and operator's requirements:
(i)
passenger safety briefing , safety cards;

(ii)
securing of galleys;
(iii) stowage of Cabin baggage;
(iv) restrictions on use of portable electronic equipment;
(v)
procedure during turbulence;
(vi) procedures when fueling with passengers on board; and
(vii) documentation.
(d)
Human Factors and Crew Resource Management, including participation in flight simulator LOFT exercises if practicable;
(e)
accident and incident reporting; and
(f)
flight and duty times limitations and rest requirements.

7
AIRCRAFT TYPE TRAINING - ADDITIONAL ITEMS FOR CABIN CREW

7.1
Practical training

7.1.1 The following is the minimum level of training necessary to satisfy the relevant requirements for cabin crew aircraft type training:
(a)
during ditching and evacuation drills, each trainee operates and actually opens all normal and emergency exits; removes and positions for use at least one escape rope; attaches escape slide fittings in their proper places; descends an escape slide from a height representative of the aircraft main deck sill height (not required for subsequent type training unless sill height is significantly higher); locates and operates the megaphone; and removes life-rafts from stowages and positions in the launching area. Additionally, the trainee must demonstrate the ability to locate and remove from stowage the aircraft first aid kits and hand fire extinguishers;
(b)
each trainee observes a practical demonstration of an escape rope being used as a means of emergency evacuation; the inflation or release, as applicable, of an escape slide; inflation of a life-raft; the survival equipment contained in the life-raft; the contents of the first aid kits; administering supplemental crew and passenger oxygen by portable equipment;
(c)
each trainee observes demonstrations of the use of the type of fire extinguishers carried on the aircraft on various types of fire including simulated galley, electrical and cabin furnishing fires. The demonstration should also show the effect of misapplication of agents;
(d)
each trainee handles and uses each type of fire extinguisher carried on the aircraft;
(e)
each trainee observes the inflation of an infant flotation cot;
(f)
each trainee practices the donning of oxygen masks carried in the aircraft; and

(g)
each trainee is familiarised with the use of the aircraft PA and interphone
system.
7.2
Evacuation Procedures and Emergency Situations
7.2.1 Emergency evacuation training is to include the recognition of particular types of emergency situations. Cabin crew will also need to recognise when exits are unusable or when evacuation equipment is unserviceable and to act accordingly to overcome these problems. Circumstances might arise, such as the incapacitation of the flight crew, where these drills might need to be initiated by cabin crew.
7.2.2 Cabin crew are to be trained to deal with the following specific emergency situations:
(a)
an unpremeditated emergency on take-off or landing, including a ditching;

(b)
a pre-warned emergency landing or ditching;
(c)
an in-flight fire, with particular emphasis on establishing the fire source;
(d)
sudden decompression, including the donning of portable oxygen equipment;
and
(e)
severe turbulence.
7.3
Crowd Control
7.3.1 Operators are to provide comprehensive training in the practical application of all aspects of crowd control in various emergency evacuation situations. Training is to emphasise the need for cabin crew to be assertive and, at times, aggressive during an emergency evacuation. Scenarios must be as realistic as possible and should include, as a minimum:
(a)
communications between flight crew and cabin crew and use of all communications equipment, including the difficulties of co-ordination in a smoke-filled environment;
(b)
verbal commands;
(c)
the physical contact that may be needed to encourage people out of an exit and on to a slide;
(d)
the re-direction of passengers away from unusable exits;
(e)
the marshalling of passengers away from an aircraft;
(f)
the evacuation of disabled passengers; and
(g)
authority and leadership.
7.3.2 The executive order to initiate an emergency evacuation is to be given by the Senior Cabin Staff Member in English ('Evacuate, Evacuate') and in Cantonese ('Saw Sarn, Saw Sarn'). Other cabin attendants should repeat the order in their native language

where passenger demography so requires.

7.4

Pilot Incapacitation

Where the flight crew consists of only 2 pilots, cabin crew are to be given training in recognising the signs of subtle incapacitation and practice the ways in which they can be of help in the event of pilot incapacitation. This should include:

(a)

use of the pilot's oxygen equipment;

(b)

familiarity with the location and method of use of pilot check lists;

(c)

fastening and unfastening pilots' seat harness and, in the case of inertia reel harness, locking and unlocking the inertia device; and

(d)

using pilots' sliding seat mechanism; training is to be given with the seat occupant simulating physical collapse. Emphasis is to be placed on 'locking' the pilot in his seat rather than on removing him from the seat, which may not in the event be possible.

7.5

Passenger Briefings

7.5.1 Training and practice is to be given in the pre-flight briefing of passengers in normal and emergency situations, including emergency landings, ditching and turbulence. Training is also to include the in-flight briefing for the pre-warned emergency landing and ditching, demonstrating the brace position and the briefing of able-bodied passengers on how to operate exits.

7.5.2 Briefings are to be given in English and Chinese (the language of Chinese can be either Cantonese or Mandarin, as justified by the operator and with the concurrence from **CAD**) and may include another language where passenger demography so requires. Where audio-video presentation is utilised, the audio text is to be in English and Chinese (promulgated as aforesaid) with each text accompanied by synchronised Chinese (traditional) characters and English sub-titles respectively.

7.6

Cabin Baggage and Cabin Clutter

Cabin crew are to be instructed that cabin baggage, service items and other objects are only to be stowed in approved areas such that they are restrained against forward, lateral and vertical movement. They must not be stowed in such a way as to obstruct or damage emergency equipment or exits. Training is to include the areas of the cabin that are approved for the stowage of cabin baggage or other items and the areas where it would be unsafe to do so.

7.7

Brace Positions

Training and practice is to be given in the correct brace positions for both cabin crew and passengers. Such training must take into account different seating configurations and orientation.

7.8

Supernumerary Sectors

On completion of emergency and survival training and prior to operating as a required crew member, cabin crew must operate a minimum number of supernumerary or "under supervision" sectors on each aircraft type. The minimum number must be agreed with the **CAD**. The supernumerary cabin attendant is required to be in addition to the normal crew complement.

8

RECURRENT TRAINING - ADDITIONAL ITEMS FOR CABIN CREW

8.1

The Annual Emergency Survival Test

Cabin crew should show a satisfactory knowledge of crowd control techniques, if applicable, and of their role in the event of pilot incapacitation. Cabin crew should also undertake first aid refresher training and pass an appropriate written test.

8.2

Periodic Practice

Cabin crew are to carry out the following practice once every three years:

(a)

pilot incapacitation drills, as specified at paragraph 7.4 of this Chapter; and

(b)

practical training in artificial respiration and cardiopulmonary resuscitation using a dummy specifically designed for the purpose.

9

APPROVAL OF AIRCRAFT EMERGENCY TRAINING APPARATUS AND OF PERSONNEL CONDUCTING TRAINING AND TESTING WITH SUCH APPARATUS

9.1

Operators may wish to conduct some of their emergency training and testing on training apparatus rather than on an actual aircraft, in accordance with Schedule 11, Part B 1. (1)(b) of the AN(HK)O. Where this is the case, the apparatus and the persons controlling the apparatus must be formally approved by the **CAD**.

9.2

Operators wishing to obtain approval for their apparatus and personnel should apply to the Flight Operations Inspectorate through their assigned Inspector to arrange an inspection. Upon satisfactory conclusion of the inspection, an approval will be issued. Renewal of the approval will be by similar inspection.

9.3

If it is proposed to use the apparatus for all practical emergency survival training and testing, it will need to meet all the items in paragraph 9.4. However, approval may be sought and given for limited use of apparatus, in which case only the relevant items need be met.

9.4

Subject to the proviso in paragraph 9.3, the apparatus should accurately represent the aircraft in the following particulars:

(a)

layout of the cabin in relation to exits, emergency exits, galley areas and safety equipment stowage; dimensions should be an accurate representation typical of aircraft in the fleet;

(b)
both cabin attendant and passenger seat positioning - with particular accuracy where these are immediately adjacent to exits;
(c)
seat dimensions and seat pitch;
(d)
operation of exits and emergency exits in all modes of operation particularly in relation to method of operation and weight and balance;
(e)
extent of movement and associated forces of all controls for all equipment and services;
(f)
provision of emergency equipment of the type provided in the aircraft;
(g)
all cabin markings;
(h)
all cabin lighting;
(i)
cabin attendant communications equipment and associated control panels;
(j)
evacuation slides, including normal and standby methods of operation; and
(k)
height and angle of inflated evacuation slides.
9.5
Operators should nominate training personnel to be approved by the **CAD** for the control of training apparatus. Operators must satisfy themselves that nominated personnel have the qualifications and experience to conduct such training and that they have undergone a period of training which the assigned Inspector may wish to observe. All approved training personnel should be so nominated in the company training manual.
9.6
An operator may arrange to use the apparatus and/or personnel of another operator. A separate approval will be required in such cases. The training given must comply with the training manual and operating procedures of the operator whose crews are being trained and items covered in the apparatus may be restricted, if significant differences of cabin layout and equipment exist.

CHAPTER 6 APPENDIX A - AVIATION SECURITY TRAINING PROGRAMME - ALL CREW

1.
Training Programmes

1.1
Operators of Hong Kong registered aeroplanes shall establish and maintain an approved security training programme which ensures crew members act in the most appropriate manner to minimize the consequences of acts of unlawful interference. As a minimum, this programme shall include the following elements:
a)
determination of the seriousness of any occurrence;

b)
crew communication and coordination;
c)
appropriate self-defense responses;
d)
understanding of behaviour of terrorists so as to facilitate the ability of crew members to cope with hijacker behaviour and passenger responses;
e)
live situational training exercises regarding various threat conditions;
f)
flight deck procedures to protect the aeroplane;
g)
aeroplane search procedures and guidance on least-risk bomb locations where practicable; and
h)
post-incident concerns for crew.
1.2
Operators conducting helicopter operations shall establish and maintain a training programme to acquaint appropriate employees with preventive measures and techniques in relation to passengers, baggage, cargo, mail, equipment, stores and supplies intended for carriage on a helicopter so that they contribute to the prevention of acts of sabotage or other forms of unlawful interference.

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CHAPTER 6 – APPENDIX B – BUSINESS JET / GENERAL AVIATION – CABIN CREW TRAINING

1 GENERAL

1.1
Under current legislation, aircraft registered in Hong Kong having 35 seats or less and carrying less than 20 passengers, flying for the purpose of public transport, are not required to have on board cabin crew for the purposes of performing duties in the interests of the safety of passengers. However, it is **CAD** policy that where cabin crew are boarded as members of the crew of such aircraft, operators are to ensure that these cabin crew receive training, both initial and recurrent, in the use of safety and medical equipment specific to their aircraft.
1.2
Crew Co-ordination
As with aircraft carrying a greater number of passengers/seats, business jets and those of a similar category depend heavily upon well-integrated communication between the whole crew to effectively contain an aircraft emergency. Cabin crew are to be aware

of the role that they can play in the bringing such an event to a successful conclusion. Aircraft safety training sessions should include, where possible, the whole crew.

1.3

Health and Safety

The dangers inherent in many training situations should be well recognised by training staff and should be taken into account in the formulation and execution of training.

1.4

Training Syllabus

A syllabus which covers familiarity with, and the use of, the equipment to be found on board the specific aircraft, along with those topics generally applicable to an aviation environment, should be specified in the appropriate manual. The syllabus should cover induction and new-to-type training, as well as annual recurrent training.

1.5

Training Staff

Appropriately qualified staff should be chosen to act as training facilitators. Each should be a qualified crewmember on the aircraft type upon which they are instructing. On appointment a **CAD** inspector will observe a training session in order to approve that appointment.

1.6

Records of Training and Tests

Records of all training and tests for each individual crewmember must be maintained and available for periodic inspection by **CAD** staff. Initial and new-to-aircraft training must be successfully completed prior to the first flight for the purpose of public transport in the aircraft. Recurrent training should be undertaken within 13 months of the previous qualification.

1.7

Use of Training Aids

The impracticability for companies in this category to provide aircraft-type 'mock-ups' is acknowledged by the **CAD**. Recognised aids which adequately fulfil the training requirement, would be acceptable to the **CAD**. This could include, but not be limited to, video and multimedia presentations and instructor briefing. Companies are encouraged, however, to utilise a dedicated training department where possible.

2

PURPOSE AND PROVISION OF TRAINING

2.1

Purpose

The purpose of emergency and survival training, practice and testing is to provide crews with the knowledge, experience and confidence to deal effectively with emergency and survival situations that could possibly be encountered.

2.2

First Aid Training

First aid training is to be given only by instructors qualified for the purpose.

3

INITIAL TRAINING – ALL CREW

3.1

Introduction

Crews should be acquainted with those physiological conditions which could possibly be encountered in the course of a flight. In addition, they should be experienced in use of the safety equipment to be found on their aircraft and the uses and limitations of such equipment.

3.2

Aeromedical and First Aid Topics

Cabin crew should have an awareness of basic aeromedical situations, including such aspects as the symptoms and treatment of hypoxia, hyperventilation, cardiac arrest, etc. In addition, they should have training in simple first aid techniques. Practical training, including the use and the limitations of both portable and fixed oxygen systems in the aircraft must be experienced, as well as familiarity with the contents and use of the aircraft first aid kit.

3.3

Fire Fighting Training

Recognition of the type of fire, choice and use of fire fighting equipment should be taught, including the inappropriate nature of certain types of fire extinguisher with certain types of fire, in addition to the knowledge of the isolation of equipment in the case of an electrical fire. The absolute need for continual liaison with cockpit crew in the situation of a cabin fire must be emphasised.

3.4

Aircraft Evacuation and Survival Equipment

Cabin crew must be conversant with the means by which passengers may be evacuated from the aircraft, both via emergency exits and through aircraft entry doors, and with all equipment related to evacuation. Where possible, removal of emergency exits should be experienced on initial training. Where liferafts are carried as permanent aircraft equipment, cabin crew should have instruction upon from where, and how, they are launched and the purposes and use of the safety equipment carried on board the rafts.

3.5

Pilot Incapacitation

Training in the identification of pilot incapacitation and the actions to be taken in such a situation must be given. This should include use of related equipment in the cockpit and the ability to secure the incapacitated pilot and the function of the pilot's seat controls. Practice in reading the cockpit checklist and its facilitation should be given.

4

RECURRENT TRAINING

4.1

All flight crew, including cabin crew, should undergo Aircraft Emergency Procedures training (AEP) on a recurrent basis. This should be done at not more than 13 month intervals and, as in the case of initial and new-to-type training, culminate in an examination. Records of such training and the results of examinations should be kept for the perusal of the **CAD**.

4.2

Activities such as the opening and removal of an emergency exit and the hands-on use of fire extinguishers should be carried out every three years.

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CHAPTER 7 - CABIN SAFETY

1 CABIN CREW

1.1 Age/Medical Requirements

1.1.1 A cabin crew member should be at least 18 years of age and have passed an initial medical examination or assessment and been found medically fit to discharge the duties specified in the operations manual. An operator must ensure that cabin crew members remain medically fit to discharge such duties.

1.1.2 The initial medical examination or assessment, and any re-assessment, of cabin crew members should be conducted by a medical practitioner registered in Hong Kong. However, when necessary, the final authority rests with a Hong Kong AMA.

1.1.3 The following medical requirements are applicable to cabin crew members:

(a) good general health;

(b) freedom from any physical or mental illness which might lead to incapacitation or inability to perform cabin crew duties;

(c) normal cardiorespiratory function;

(d) normal central nervous system;

(e) adequate visual acuity - 6/9 with or without glasses;

(f) adequate hearing; and

(g) normal function of ear nose and throat.

1.2 Senior Cabin Crew members

1.2.1 Whenever more than one cabin crew member is carried on a flight, the operator must nominate a senior cabin crew member. The senior cabin crew member will be responsible to the commander for the conduct and co-ordination of the cabin safety and emergency procedures specified in the operations manual.

1.2.2 An operator shall not appoint a person to the post of senior cabin crew member unless that person has at least one year's experience as an operating cabin crew member and has completed an appropriate course of training.

1.2.3 An operator shall establish procedures to select the next most suitably qualified cabin crew member to operate as senior cabin crew member in the event of the nominated senior cabin crew member becoming unable to operate. Such procedures must be acceptable to the **CAD** and take into account the cabin crew member's operational experience.

1.3

Cabin Crew Complement

1.3.1 It is incumbent on operators to ensure that passenger-carrying public transport aircraft do not fly with lesser numbers of cabin crew than the law prescribes. Furthermore, minimum numbers specified in operations manuals should take full account of all the factors detailed below.

1.3.2 Required Complement

The complement specified will be that calculated in accordance with Article 18(7)(c) of the Air Navigation (Hong Kong) Order 1995, or for wide bodied aircraft one Cabin Crew member per door that is designated an Emergency Exit, whichever is the higher. In exceptional circumstances the complement may be reduced and will become that specified in a Permission granted in accordance with the provision to Article 18(7).

1.3.3 Minimum Complement

The minimum complement specified in the operations manual will be not less than the required complement but may be greater. Factors that should be taken into account when calculating the minimum complement will include:

(a)
the number of exits;

(b)
the type of exits and their associated slides;

(c)
the location of exits in relation to cabin crew seats and cabin layout;

(d)
the location of cabin crew seats taking into account cabin crew duties in an emergency evacuation including:

(i)
opening floor level exits and initiating stair or slide deployment;

(ii)
assisting passengers to pass through exits; and

(iii) directing passengers away from inoperative exits, crowd control and passenger flow management.

(e)
actions required to be performed by cabin crew in ditching emergencies, including the deployment of slide-rafts and the launching of life-rafts; and

(f)
the number of crew who actively participated in the cabin during the emergency evacuation demonstration for aircraft certification.

NOTE: Having regard to all the considerations listed above, the minimum acceptable complement of cabin crew will, in most circumstances, be not less than one cabin crew to serve every floor level exit. This number might not always be appropriate, for example, where the position of floor level exits in a cabin is such that it enhances the importance of non floor level exits e.g. overwing exits, when consideration should be given to seating cabin crew adjacent to the latter. Also, this number could even be excessive; for example when, as on some narrow-body aircraft, two floor level exits are very close together it is reasonable to expect one cabin crew to open both exits and initiate stair or slide deployment in turn before assisting evacuation from both simultaneously.

1.3.4 Normal Complement

The normal complement will be not less than the required complement and may be greater than the minimum complement. Its use would be to guide rostering staff to crew the cabin to a level required to provide a service to passengers that could not be achieved with lesser numbers.

1.3.5 When scheduling cabin crew for flights, rostering procedures should take account of the experience of each cabin crew member such that the required cabin crew includes some cabin crew members who have at least three months operating experience as a cabin crew member.

1.3.6 If operators should seek alternative solutions, it will be for them to satisfy the **CAD** that such lesser numbers of cabin crew as they wish to specify are so positioned throughout the aircraft and have such drills specified that they can reasonably be expected to manage any cabin emergency that might arise. In circumstances such as these, operators should pay particular attention to ensuring that cabin crew who have least experience of working in the aircraft or with the operator are paired with those who are well experienced.

1.4

Operation on more than One Type or Variant

1.4.1 Cabin crew may not normally operate on more than three aircraft types except that, with the agreement of the **CAD**, they may operate on four types provided that safety equipment and emergency procedures for at least two of the types are similar.

1.4.2 For the purposes of paragraph 1.4.1, variants of a particular aircraft type are considered to be different types if they are not similar in all of the following aspects:

(a)
emergency exit operation;

(b)
location and type of safety equipment; and

(c)
emergency procedures.

1.5

Recency

1.5.1 An operator shall ensure that any cabin crew member who has been absent from all flying duties for more than six months completes refresher training as specified in the operations manual. The training shall include at least the requirements listed in paragraph 1.6.

1.5.2 An operator shall ensure that any cabin crew member who has not, during the preceding six months, operated on a type or variant, before undertaking duties on that type either:

(a)
completes refresher training on the type; or

(b)
operates two sectors under supervision.

1.6

Training

An operator shall ensure that initial training (and refresher training at regular intervals) will be provided for each cabin crew member which includes at least the following;

(a)
emergency procedures including pilot incapacitation;
(b)
evacuation procedures including crowd control techniques;
(c)
the operation and actual opening of all normal and emergency exits for passenger evacuation in an aircraft or approved training device;
(d)
demonstration of the operation of all other exits; and
(e)
the location and handling of emergency and life-saving equipment, including oxygen systems, portable oxygen, protective breathing equipment, the donning of life-jackets, the use of first aid and, if carried onboard, universal precaution kit in case of suspected communicable disease.

NOTE: Guidance on the types, number, location and contents of the medical supplies (including first-aid kits, and/or universal precaution kits, and medical kit when required) is given in Annex 6 Part I Chapter 6 Attachment B.

1.7
Uniforms

1.7.1 Operators should provide crew uniforms which readily distinguish the wearer as a member of the cabin staff. Uniforms should, whenever practicable, be manufactured from non-thermoplastic material, such as wool; particular attention should be paid to uniform linings and melt factors.

1.7.2 Protective clothing for at least two crew members, such as a quick donning jump suit manufactured from a non-thermoplastic material, should be provided for aircraft being operated in a combined passenger and cargo role, i.e., Class 'B' compartments.

1.7.3 Care should be exercised in the provision of cabin crew's footwear. Appropriate shoes should be worn during take-off and landing, to cater for possible emergency situations etc., so as to avoid damage to slides.

1.7.4 All chains worn around the neck and unconcealed by clothing have the potential to snag and so hamper movement. At worst they can be a cause of injury to the wearer. Both the restriction of movement and the risk of injury that may occur when neck chains are worn have the potential to inhibit crews from carrying out their duties. Operators must therefore instruct crews to remove unconcealed neck chains when on board aircraft. If there is a requirement that ID cards must be displayed, other forms of attachment must be used, care being taken to ensure that this does not result in loose chains continuing to present a risk of snagging.

2
CABIN SAFETY MANAGEMENT

2.1
Pre-departure Procedures

2.1.1 Operators should establish check-in and boarding gate procedures and, where applicable, training for their traffic staff and handling agents. Emphasis should be placed on the need for these personnel to identify and resolve potential difficulties in seat allocation (see also paragraphs 2.2 and 2.3), excess cabin baggage, the carriage of dangerous goods, drunken or unruly passengers, including boarding refusal, before passenger embarkation begins. This is of particular importance at overseas departure points.

2.1.2 Similar instructions and training should also be given to cabin crew to deal with problems which may have been missed at check-in.

2.2

Seat Allocation

2.2.1 The following types of passengers should not be seated where they could obstruct emergency exits, impede the crew in their duties, obstruct access to emergency equipment or hinder aircraft evacuation:

(a)

handicapped people, including the blind and deaf. Only one such passenger should be allocated to each floor level exit;

(b)

persons who are elderly or frail;

(c)

children and infants, whether accompanied or not;

(d)

deportees or prisoners in custody; and

(e)

obese passengers.

2.2.2 Handicapped passengers should be seated as close to emergency exits as the above limitations allow. Operators should refer to FON 04/2008 for detailed guidance on the handling of passengers with disabilities.

2.3

Seat Allocation at Self-help (Types III and IV) Exits

2.3.1 Seats which form the access route from the cabin aisle to these exits should only be allocated to passengers who appear capable of operating and/or assisting with the operation of the exit; check-in staff should identify likely candidates for these seats.

2.3.2 On no account should the types of passengers, listed in paragraph 2.2.1 be allocated seats which form the access route from the cabin aisle to these types of exit. Preference should be given, where possible, to seating non operating crew at these locations.

2.4

Drunken Passengers

2.4.1 Article 49 of the AN(HK)O states that "A person shall not enter any aircraft when drunk or be drunk in any aircraft".

2.4.2 Operators are to provide instructions, advice and training to all relevant staff on dealing with passengers who have been drinking excessively. Such advice should include when to deny boarding rights and reiterate the commander's prerogative to exercise the powers, as conferred by the AN(HK)O, to protect the safety of the aircraft and passengers.

2.4.3 Drunken passengers constitute not only a possible source of annoyance to fellow passengers but also a hazard to flight safety. Potentially hazardous incidents should be reported through the MOR scheme.

2.5

Stowage of Cabin Baggage

2.5.1 Cabin baggage may only be stowed in approved locations. Operators should provide clear and unequivocal advice on which areas are approved.

2.5.2 Overhead lockers and other stowages must be clearly placarded with weight limitations and enclosed by latched doors or load bearing nets as appropriate; cabin crew must be made aware of the need to ensure that limitations are not exceeded.

2.5.3 Underseat stowages may only be used if the seat is equipped with a restraint bar and the

baggage is of a size to fit under the seat.
2.5.4 Baggage must not be stowed in toilets, immediately forward or aft of bulkheads, or in such a manner that it will impede access to emergency equipment. Particular attention must be paid to maintaining the integrity of all evacuation routes.

2.6
Stowage of Catering Supplies and Crew Effects
2.6.1 All catering supplies, blankets, pillows, newspapers etc. are to be securely stowed in approved areas for take-off and landing.
2.6.2 Similarly, crew effects, including baggage and clothing, must be stowed in approved areas. Particular care must be taken to ensure that doors and exits, including operating handles, are not obstructed nor ready access to emergency equipment precluded.

2.7
Carriage of Aerosols
2.7.1 Advice and instructions should be provided to crew on the carriage of aerosols. In particular, the potential fire hazard posed, and how this may be obviated by careful stowage should be emphasised.

2.7.2 Unless it is unavoidable, aerosols should not be used for dispensing air fresheners, insecticides or other similar agents.

2.8
Portable Electronic Equipment
The **CAD** has considered evidence that navigation equipment may malfunction as a result of interference from passengers' portable electronic equipment. At the request of the commander, cabin crew may be required to check the cabin for portable electronic equipment being used by passengers.

2.9
Spillage of Drinks
There is an obvious potential for a major incident to occur when such items as conductive liquids in open containers, cutlery etc are mishandled on aircraft flight decks. All operators are requested to review their procedures for handling drinks and other items in and around the flight deck, as appropriate. Clear advice should be given to all crew on how best to route drinks when passing them about, so as to avoid any risk of accidental spillage on to electrical equipment

2.10 **Security of Flight Crew Compartment**
2.10.1 Operational procedures must be in place to prevent unauthorized persons from entering the flight crew compartment. Particular attention must be paid to entering and exit procedures, monitoring of door area, and procedures for crew leaving the flight crew compartment.
2.10.2 Operators shall also establish a policy and procedures with regard to cabin crew notification to flight crew in the event of suspicious activity or security breaches in the cabin.
2.10.3 FON 04/2002 remains current and shall be referred to by operators.

3
SAFETY BRIEFING

3.1
Passenger Briefing
3.1.1 Passengers are to be given a pre-departure briefing, without distraction by other cabin activities. The briefing should cover all relevant points appropriate to the aircraft type and operation being undertaken. The following points must be pointed out by demonstration or video:

(a)
seat belt operation;
(b)
location of emergency exits, including any unserviceabilities;
(c)
life-jacket operation, where required; and
(d)
operation of drop-out oxygen, where required.
Passengers' attention must be drawn to smoking restrictions; when appropriate, the availability of infant life-jackets and flotation cots; the need for children's and babies oxygen masks to be fitted after those of their accompanying elders; and advice on wearing seat belts at all times.

3.1.2 The location of floor lighting systems must be included in the briefing and, where possible, the system should be activated for a few seconds.
3.1.3 Passengers' attention should be drawn to the safety card and mention made of the instructions for operating types III and IV exits, if appropriate.
3.1.4 Attention should also be drawn to restrictions on the use of personal electronic equipment, including mobile telephones; this is to be repeated prior to landing.
3.1.5 here briefings are given by the use of a video presentation, cabin crew must monitor screens to ensure that each passenger receives a full briefing and, particularly with larger aircraft, physically indicate the nearest available exit. Where passengers have not, or cannot (because of location), received a full briefing by video, individual briefings must be given.
3.1.6 Operators should ensure that their crew drills include a procedure for passengers to be warned of impact so that they can adopt the brace position at the appropriate time before impact.
3.2
Passenger Safety Cards
3.2.1 The passenger safety briefing must be supplemented with a pictorial safety notice relevant to the type of aircraft and its safety equipment (passenger safety card). Information contained in the card must be consistent with the briefing. A copy of each card currently in use must be lodged with the Flight Operations Inspectorate.
3.2.2 The card is to be designed and produced as an entity separate from any other literature. It should be located so that the seated passenger can readily see and identify it; a distinctive message that it contains safety information should be placed at the top of the card.
3.2.3 Equipment and operating methods should be depicted pictorially, using internationally recognised symbols wherever possible. Any wording, which should be kept to a minimum, is to be in English with equivalent Chinese characters.
3.2.4 Passenger safety cards must provide the following information:
(a)
seat belts - instructions for fastening, adjusting and unfastening;
(b)
exit location - routes to exits should be indicated;
(c)
exit operation - for all types of exit fitted. Illustrations should depict a person operating the exit with the direction of the movement of handles clearly indicated;
(d)

use of evacuation slides - depicting the correct method of use, the manual inflation handle and discarding high heeled shoes;
(e)
brace positions - for all types of seat orientation and pitch in use on the aircraft;
(f)
oxygen masks - instructions on locating, donning and adjusting the mask; initiating oxygen flow. Instructions should be given that masks should be fitted to children only after their guardians have fitted their own;

(g) life-jackets - removal from stowage, removed from container and inflation. The card must show that, excepting children, the life-jacket must not be inflated within the cabin; and
(h)
life-rafts - location, removal, preparation for use. inflation and launching. Launching locations should be indicated.
Additionally, operators may wish to include the following:
(i)
Smoking - restrictions;
(j)
Seatbacks and trays - upright and stowed for take-off and landing; and
(k)
Emergency floor path lighting systems.

4
CABIN CREW DUTIES

4.1
Pre-flight Briefings

Cabin crew should be given a safety briefing prior to the commencement of any flight and, in a series of consecutive flights, after each full rest period. Consideration should be given to the following:
(a)
areas dedicated to pre-flight briefing usage that afford privacy should be provided;
(b)
copies of the relevant cabin safety manual and current safety notices must be available;
(c)
all cabin crew present should be required to answer satisfactorily at least one question on aircraft safety (emergency drills, safety equipment location and usage) or one on first aid;
(d)
the allocation of cabin crew to specific seats in the passenger compartment, where applicable, should take due account of the need to ensure that no area is devoid of persons who have experience in the conduct of safety-related duties;
(e)
safety 'reminders' that address any recent changes to safety-related issues or any perennial problems should be given; and
(f)
action to be taken by the Senior Cabin Crew Member (SCCM), if it becomes apparent that any crewmember displays inadequate knowledge of

safety-related issues.

4.2

Allocation of Cabin Crew Stations

4.2.1 General

Arrangements should be made, preferably during rostering, to ensure an even spread of experienced cabin crew through the aircraft. SCCMs should allocate duties and positions on the day with this in mind. The SCCM must occupy an approved crew seat for all take-offs and landings.

4.2.2 Senior Cabin Crew Member Seating

When the assigned crew station of the SCCM does not allow immediate access to the flight deck, operators must specify drills which reflect the following:

(a)
the cabin crew seated closest to the flight deck should be responsible for communicating with the flight deck crew in the event of any emergency on take-off or landing; and

(b)
emergency evacuation procedures should require the SCCM to remain at his or her station and to control and operate the emergency exits.

4.3

Embarkation and Disembarkation of passengers

Instructions should be available to crews for marshalling of passengers at stations where ground handling staff are unavailable.

4.4

Arming and Disarming Slides

Slides should be armed as soon as obstructions to their deployment (steps, jetties etc) are removed and clear. Slides should remain armed after landing until arrival 'on stand'. Crews should be aware of the dangers of accidental deployment.

4.5

Duties Prior to Take-off and Landing

4.5.1 Cabin crew carried in accordance with AN(HK)O requirements should remain at their stations with harnesses fastened, except when performing duties related to the safety of the aircraft and its passengers.

4.5.2 All catering and other equipment is to be stowed prior to take-off.

4.5.3 All items of galley electrical equipment should be switched off.

4.5.4 Operators must ensure that at any time the aircraft is on the ground, provision for the safe and rapid evacuation of passengers in an emergency is maintained.

4.6

Cabin Lights for Take-off and Landing

The dimming of interior cabin lights, particularly when taking-off and landing at night, is recommended.

4.7

Refuelling Operations with Passengers on Board

When operators wish to refuel aircraft with passengers on board, instructions should be issued to crews. Instructions should cover at least the following points:

(a)
aircraft steps and jetties, and cabin crew positions;

(b)
smoking prohibition;

(c)
restriction on use of electrical equipment and switch gear; and
(d)
slide arming and clearance area.
Operators should discuss such proposals with their assigned Inspectors.

4.8
Flight Crew and Cabin Crew Liaison

4.8.1 Operators' instructions should be clear on the need for good liaison to exist between flight crew and cabin crew.

4.8.2 A means must be established for the conduct of liaison. Such liaison should extend until after the aircraft has arrived at its final destination where, for instance, cabin safety equipment defects may need to be attended to.

5
SAFETY, EMERGENCY AND SURVIVAL EQUIPMENT

5.1
Provision of Oxygen Equipment

5.1.1 The amount of oxygen to be carried and the number of passengers for whom suitable masks must be made available vary with operating altitude, attainable rate of descent and Minimum Safe Altitude (MSA).

5.1.2 Information and instructions must be provided by the operator to his operating staff to ensure that flights may be conducted in accordance with the relevant legislation. Any aircraft which is not correctly equipped must be appropriately restricted in its use, e.g. by imposition of operating altitude or route restrictions, until such time as an appropriate scale of oxygen and equipment is fitted or repairs effected.

NOTE: Information on the dangers of explosion caused by the proximity of any oxygen equipment, including therapeutic oxygen, to any naked flame or incipient fire must be stressed.

5.2
Re-stowage of Oxygen Masks

It is recommended that cabin crew do not attempt to re-stow oxygen masks after deployment. Damage to the equipment and possibly cabin crew injury may result. Re-stowage of such equipment should be undertaken by maintenance personnel only.

5.3
Portable Protective Breathing equipment

5.3.1 Portable Protective Breathing Equipment (PPBE) must be approved by the **CAD**. Advice on which equipment has been approved may be obtained from the **CAD's** Airworthiness Office.

5.3.2 PPBE units are to be stowed as close to the crew station as practicable and must be readily accessible. Pre-flight serviceability checks must be capable of being readily achieved.

5.3.3 Operators should ensure that transportation security or any other seals are removed

prior to installation on the aircraft.
5.3.4 Failures or any problems associated with PPBE must be reported via the Mandatory Occurrence Reporting scheme (MOR) to the Airworthiness Office.

5.4
Carriage of Tropical and Polar Survival Equipment

5.4.1 The AN(HK)O specifies the type and quantity of equipment which is required to be carried on flights over areas where, in the event of an emergency landing, tropical or polar conditions are likely to be met. Such areas are defined as follows:

(a)
Tropical Areas
(i)
those parts of Asia south of latitude 40°N;
(ii) Africa;
(iii) Central and South America; and
(iv) New Guinea and the remote central areas of Australia.

(b)
Polar areas
(i)
areas north of latitude 66°33'N and south of latitude 66°33'S;
(ii)
that area of North America north of 60°N and between longitude 60°W and 175°W (Seasonal);
(iii) that part of Asia north of latitude 40°N and east of longitude 45°E, but excluding mainland Japan (Seasonal); and
(iv) that part of Europe, including the UK, north of latitude 56°N (Seasonal).

5.4.2 Carriage of such equipment is not required if an aircraft flies within the areas detailed at paragraph 5.4.1 of this section and an emergency landing can be made where polar and tropical conditions are not likely to be encountered, provided the same range and performance criteria detailed in the 'circumstances of flight' column of paragraph 4 of Schedule 5 to the AN(HK)O, to establish whether sea survival equipment (scale K) needs to be carried, are not exceeded.
5.4.3 Polar survival equipment will usually be required to be carried during the period November to April inclusive. Flights conducted north of the Arctic Circle are unlikely to be affected by seasonal variations in climate thus requiring the carriage of such equipment at all times of the year.
5.4.4 Some States call for the carriage of particular survival equipment on flights over their territory. Operators should familiarise themselves with these requirements.

5.4.5 Special consideration should be given to the carriage of durable water containers to take advantage of fresh water supplies on board the aircraft.
5.4.6 For operations by helicopters and small aeroplanes in desert areas, where Search and Rescue (SAR) facilities are known to be limited and climatic conditions are particularly inhospitable, tropical equipment will be considered necessary. Similarly for operations in wintry conditions, particularly by helicopters, consideration should be given to the carriage of polar equipment.

5.5
Search and Rescue

5.5.1 The operations manual shall include the ground-air visual signal code for use by survivors, as contained in ICAO Annex 12.

5.6
Carriage of Life-jackets and Flotation Cots for Children and Infants
5.6.1 Arrangements must be made to ensure that appropriate survival equipment is available for children and infants prior to the despatch of an aircraft.
5.6.2 On flights where life-jackets are to be carried, the following equipment is required to be provided for each child and infant:
(a)
children of 3 years and over:
an adult life-jacket which has been approved for use by children;
(b)
infants between 18 months and 3 years:
an approved infant life-jacket;
(c)
infants under the age of 18 months:
an approved flotation cot.
NOTE: Infant flotation devices are approved solely for the purpose of protection and flotation on water and not as restraint devices prior to impact. 'Approved' in the above context refers to the approval obtained by the equipment's manufacturer.
5.6.3 Operators should establish procedures for the provision and re-provision of such equipment, when standard aircraft installations are supplemented by uplifts at route stations.
5.7
Waste Containment
5.7.1 All receptacles for towels, paper and other waste are to be constructed of materials resistant to fire as required by the relevant airworthiness requirements. Their fire containment is to be demonstrated by test.
5.7.2 Waste bags are not approved by the **CAD**. It is, however, the responsibility of the operator to control the quality of their waste bags in order that resistance to fire is maintained; the fire containment must be demonstrated by the test. For further information contact the Airworthiness Office.

5.7.3 Waste bags may only be stowed in toilet compartments during the final phases of flight, provided that they contain only low density waste such as paper and plastic cups.
6
ABNORMAL AND EMERGENCY PROCEDURES
6.1
Turbulence
6.1.1 If turbulence is forecast, the aircraft commander should brief the SCCM prior to departure.
6.1.2 When turbulence is encountered, the commander should direct appropriate action via the SCCM.
6.1.3 If in-flight service is to be discontinued, all trolleys, galleys and cabin equipment are to be secured and checks undertaken to ensure that passengers are seated with their seatbelts fastened.
6.1.4 Cabin crew should take their seats and fasten harnesses as soon as is reasonably practicable.
6.1.5 Operators should have in place procedures regarding the avoidance and handling of in-flight turbulence. Regular review should be carried out with respect to the following:

(a)
Preflight briefing by flight crew to the cabin crew and the passengers of the forecasted turbulence;
(c)
Proper and effective weather assessment before and during flight by all available means;
(d)
Commitment to SOP with regard to seat-belt usage, turbulence and weather avoidance techniques and effective communication during the flight;
(e)
CRM training for crew members;
(f)
Effective training to prevent or mitigate injuries to cabin crew caused by turbulence;
(g)
Establishment of policy and procedures as to when cabin crew should be seated taking into account the potential risk of turbulence in flight.
6.2
Cabin Fires
6.2.1 Cabin attendants must continually survey the aircraft cabin and galley areas for potential and existing fires.
6.2.2 Additionally, a frequent check of toilet areas must be undertaken, noting in particular that smoke sensors remain unblocked.

6.2.3 On detecting a fire and/or smoke, the flight crew must be informed immediately of its location, source and severity and be kept informed as the situation develops.
6.2.4 After a fire has been extinguished, the area around it must be monitored for potential re-ignition.
6.3
Oven Fires
6.3.1 Oven fires can be caused by a variety of factors the dangers of which would be minimised by thorough inspections of ovens both for cleanliness and for the presence of foreign objects.
6.3.2 The primary hazard from an oven fire occurs when the door of a heated oven is opened. The introduction of outside oxygen can cause a flash fire. In dealing with an oven fire or oven overheat, the following procedure is recommended:
(a)
isolate the electrics and keep the door closed. In most incidents the fire will self-extinguish;
(b)
monitor the situation. Have a fire extinguisher, fire gloves and protective breathing equipment (PPBE) to hand; and
(c)
if the situation worsens, or it is thought that fire still exists in the oven, open the oven door just enough to insert the nozzle of the fire extinguisher. Insert the nozzle of the fire extinguisher and discharge a small amount of the extinguishant; consideration should be given to donning PPBE and fire gloves prior to opening the oven door. Close the oven door and monitor the oven. Repeat this procedure if necessary.
6.4

Ban on the use of Therapeutic Oxygen whilst Fire Fighting
The use of therapeutic oxygen whilst fire-fighting is extremely hazardous since therapeutic oxygen may itself feed the fire, thus resulting in severe injuries to the crew member wearing the equipment. Additionally, therapeutic oxygen equipment only provides a low supplemental oxygen flow which will afford little relief in a smoke-laden atmosphere.

6.5
Bomb Warning Procedures
On receipt of a bomb-on-board warning, the SCCM is to implement the procedures detailed in the Operations Manual and associated aircraft checklists, as directed by the aircraft commander.

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8.5
Fuel Alternates
8.5.1 An aerodrome suitable in all respects for use as an alternate, if a landing cannot be made at the intended destination, must be identified on both the pilot navigation log (plog) and on the ATC flight plan.
8.5.2 When the planned alternate aerodrome is in the same busy area as the destination, for instance Hong Kong and Macau, the track miles on which the fuel requirement for flying to the alternate is calculated should be realistically assessed taking account of the extended routeing which can reasonably be expected during busy periods.

8.6
Minimum Fuel
8.6.1 Under ICAO terminology, 'minimum fuel' describes a situation in which an aircraft's fuel supply has reached a state where little or no delay can be accepted.
8.6.2 Minimum Fuel. For operations under a Hong Kong AOC, the minimum fuel with which the aircraft must land is an amount equal to 30 minutes holding at a height of 1500 ft at the planned landing weight. Where it becomes apparent that a flight is likely to land with less than minimum fuel, the commander is to declare an emergency.

8.7
ETOPS
Operations manuals should, if applicable, specify fuel planning requirements and procedures for flights operated under Extended Range Twin Operations (ETOPS) rules.

8.8
Fuel Planning - Specific Requirements
8.8.1 At the planning stage the quantity of fuel required to be on board before the aeroplane departs should be calculated and recorded. Only those procedures that are specified in operations manuals may be used.

8.8.2 Normal Planning. For most flights, the formula for calculating before flight the amount of fuel required is the sum of:
(a)
start-up and taxy fuel;
(b)
sector fuel;
(c)
alternate fuel, i.e. fuel for a missed approach procedure and then from overhead the intended destination airfield to a suitable alternate;
(d)
holding fuel, i.e. fuel to hold and make an approach at the most critical alternate aerodrome, calculated as follows:
(i)
in the case of propeller-driven aeroplanes, fuel to hold for 45 minutes and carry out an approach and landing; or
(ii)
in the case of turbo-jet aeroplanes, fuel to hold for 30 minutes at 1500 feet above the aerodrome under International Standard Atmosphere (ISA) conditions and carry out an approach and landing;
(e)
contingency fuel, i.e. not less than 5% of the sum of Sector fuel and Alternate fuel.
NOTE: Account should be taken also of additional amounts such as those listed in paragraph 8.3.
8.8.3 Use of En-Route Alternate (ERA). The normally calculated contingency fuel can be reduced by use of a nominated ERA as follows:
(a)
The ERA must be an adequate aerodrome which is open. The forecast weather must be such that a landing can be assured.
(b)
5% of the fuel required to fly from overhead or abeam the ERA to the destination may be substituted for the contingency element of sector fuel, but cannot be less than that required to cruise from that position for 5 minutes at the then all-up weight of the aeroplane.
8.8.4 Use of Remote Aerodromes. When the destination aerodrome is geographically isolated and has no suitable alternate within a reasonable range, the alternate and holding fuel can be substituted by a holding reserve. The following conditions shall be satisfied:
(a)
the holding reserve shall be not less than two hours fuel at normal cruise consumption at the all-up-weight applicable to arrival overhead the destination;
(b)
the holding reserve shall be related to statistical data on local weather conditions and sufficient for holding for a time period based on this data;
(c)
aerodromes designated ‘Remote’ shall be listed in the operations manual; and
(d)
the latest point of diversion between the remote aerodrome destination and a suitable en-route diversion shall be calculated.

8.8.5 Reclearance in Flight. When a flight cannot depart with the total fuel calculated in accordance with the normal planning formula, dispatch may be achieved by the operator nominating a suitable aerodrome en-route as the destination with the intention of obtaining a reclearance in flight to the original destination, if the commander is satisfied that:

(a)
the nominated destination aerodrome is both suitable and available with the weather forecast satisfactory for landing; and

(b)
the fuel on board, when passing over or abeam the nominated aerodrome en-route, is sufficient to satisfy the normal planning formula from that point to the original destination.

NOTES:(1)
Pilot navigation logs must show the name of the aerodrome en-route that is used for this planning purpose; the weather conditions relating to both destination and nominated en-route aerodromes must be recorded.

(2) Some Authorities are not willing to have aerodromes in their jurisdiction nominated as a destination, if that is not the intention, as may be the case in this procedure.

8.9

Fuel Management - En-Route

8.9.1 *General Requirements.* Airborne fuel usage must be monitored, with the aim of ensuring that throughout the flight the fuel on board remains sufficient to satisfy the requirements listed below. Clear instructions must be given on the action the commander must take i.e. range of options requiring consideration, if at any stage it appears that the fuel on board is less than required.

8.9.2 *Company Minimum Reserve (CMR).* This is the minimum, normal fuel state on arrival at the destination missed approach point (MAP). It is the sum of*:*

(a)
The fuel required to proceed to the chosen alternate airport; and

(b)
Contingency fuel applicable to (a); and

(c)
Sufficient fuel to enable, in the case of turbojet-powered aircraft, the flight to hold for a period of 30 minutes at a height of 1500 ft at the aircraft's planned landing weight at the alternate airport.

8.9.3 *Use of En-Route Alternate (ERA).* For flights that use the ERA formula, on passing overhead or abeam the ERA, the fuel expected to remain at the MAP of the intended destination should not be less than CMR.

8.9.4 *Use of Remote Aerodromes.* For flights that use the remote aerodrome conditions, on passing the latest point of diversion the fuel expected to remain overhead the intended destination should not be less than the holding reserve. Crews must, before passing this point, obtain the weather conditions existing at the destination and a current forecast for the time of expected arrival.

8.9.5 *Reclearance in Flight.* For flights that use the reclearance in flight procedure, when passing over or abeam the nominated destination aerodrome (reclearance point), the fuel expected to remain at the MAP of the original destination should not be less than

CMR.
8.9.6 *Fuel Balancing.* On multi-crew aircraft the instructions for fuel balancing must cover the following points:
(a)
if an abnormal fuel feed procedure is used to balance fuel, the aircraft commander must be informed and at least two flight crew members must monitor the operation; and
(b)
when balancing fuel on aircraft with more than two engines, one engine, where practical, should remain on direct feed from tank to engine. Preference should be given to an engine with an operative electrical generator and where applicable a hydraulic pump.

8.10 Predicted Reduced Fuel State - Destination

8.10.1 A fuel progress chart must be included as part of the CFP for each flight made for the purposes of public transport, in order to predict a flight's arrival fuel at its destination. Periodic entries made at regular intervals by the crew, enable a perception to be made of how well the flight is doing in relation to the planned fuel progression and enables the crew, at some point along the route, to determine with fair accuracy, whether the flight will arrive at the destination with the required amount of fuel – the CMR – on board.
8.10.2 *General Requirement*s. If it becomes apparent that the fuel remaining is close to the CMR, the commander must have clear instructions on the actions he must take. Whilst en-route, options generally available are:
(a)
adjust aircraft speed;
(b)
obtain a more direct routing;
(c)
fly at a different flight level;
(d)
land and refuel; or
(e)
select an alternate aerodrome which is closer to the destination airfield than that specified in the ATC flight plan and so reduce the CMR.
8.10.3 Where a flight has been despatched with less than the required fuel, for example when utilising an ERA, early fuel checks will naturally show that the predicted fuel remaining will be less than CMR. As the flight progresses, updated assessments of the fuel remaining at the destination will continue to be made. The decision, in the light of the fuel required, regarding continuing to the destination or diverting to an en route airport, should be made at a point where diversion is still feasible.

8.10.4 If en route it becomes obvious that a flight will not arrive at the destination with the required CMR, the flight may continue to the planned destination, provided that the fuel remaining on landing will be not less than an amount equal to that which would enable the aircraft to hold for 30 minutes at 1500 ft at the anticipated landing weight – i.e. Minimum Fuel – and ALL of the following conditions are satisfied:
(a)
There must be at least two geographically separate runways available for use which meet the performance criteria for the aircraft; and
(b)

There must be no ATC delays forecast for the flight's ETA at the destination;
and
(c)
The actual weather and that forecast for the flight's ETA at the destination must be at, or better than, the alternate planning minima for the non-precision approach aid with the higher minima serving the two runways being considered in (a) above and, in addition, the surface wind is within the normal crosswind limits for the aircraft type.

Where these conditions are not satisfied, the flight must **divert** to an en route airport for refuelling.

8.10.5 *After Commencing Descent*

If, after commencing descent, an unforeseen situation develops which may prejudice arrival at the destination MAP with CMR fuel, the flight may continue to the destination airport provided that the fuel remaining on landing will be at least equal to Minimum Fuel. However, the commander must, in electing to continue rather than proceed to the alternate, ensure that all relevant factors are taken into consideration with particular reference to the reason for the delay, weather deterioration and runway availability at the destination and alternate. If at any time it becomes apparent that a flight cannot be completed with Minimum Fuel available upon landing, an emergency must be declared.

8.10.6 *Delays Exceed Expectation.* Operators must make clear what action is to be taken by commanders, if the fuel remaining could reduce or has reduced below the amounts derived from the considerations listed 8.10.4 and 8.10.5.

9

FUEL PLANNING AND MANAGEMENT - HELICOPTERS

Cancelled - refers to CAD 360 Helicopter Supplement

10

CHECK-LISTS

10.1 The drills and checks to be followed including those for emergency and abnormal conditions should be listed in full in the operations manual in the form of expanded check-lists. In addition, abbreviated working check-lists should be provided on the flight deck for the use of the flight crew.

10.2 The check-lists and drill cards provided by an operator for use by his crews must correctly reflect the requirements, instructions, drills and procedures specified in the aircraft's Flight Manual.

10.3 Instructions on how to use the checklists and drill cards should be provided in the manual. For convenience in handling, the check-list for normal operations should be separate from the abnormal and emergency check-list. The colour of the emergency and abnormal check-lists should be sufficiently distinctive to avoid them being mistaken for other volumes. They must be stowed on the flight deck separately from other documents in such a manner as to be immediately ready for use.

10.4 Separate check lists or drill cards must be provided for each flight crew member. In 'single pilot' aircraft, check lists can be supplemented by placarding vital actions for final approach and landing.

10.5 All check lists or drill cards must be of a quality sufficient to withstand heavy wear and remain legible. The design and utilisation of checklists shall observe Human Factors principles.

10.6 Details of cabin crews' ditching, crash landing and emergency evacuation drills should be readily available. This may be achieved either by issuing to each cabin crew a copy of their emergency drills - which they should be required to carry with them - or stowing the drill cards at appropriate positions in the cabin.

10.7 On multi-crew aircraft, instructions must be given that check lists are always to be used. On single pilot aircraft the operator may allow in-flight drills to be carried out from memory but must ensure that a check list is readily available to the pilot. Memorised drills must be carried out strictly in accordance with the check list and emergency drills must be verified as soon as possible by reference to the check list.

10.8 On multi-crew aircraft, drills should be so constructed that the handling pilot, as far as possible, has only to control the aircraft's flight path and cross check the correct selection of a lever or a switch before it is used. The use of responses such as "SET" or "AS REQUIRED" should be avoided and are better replaced by a specific indication of what is required.

10.9 Where emergency and abnormal drills do not include all the necessary items and actions to re-land, a clear instruction referring the crew back to the normal check-list must be made.

10.10 An abbreviated version of the normal check-list may be produced for use by training captains whilst on circuit training. This should retain the sequences of the normal check-list.

10.11 Each page of a check-list must be dated and the amendment state of the check-list ascertainable by means of a simple amendment record. This record should be incorporated at a suitable place in the check-list.

10.12 The following items, where applicable, must be included at the appropriate point in the normal check-list (the actual form of words may be varied):

(a) crew seats, seat belts and harnesses fastened/locked for take-off and landing;

(b) flying controls unlocked and checked for freedom of movement;

(c) cabin prepared for take-off and landing;

(d) reference speeds noted and/or bugs set and cross checked;

(e) instruments checked before take-off and prior to commencing approach;

(f) altimeters set and cross checked and required setting (QFE, QNH, QNE) at each stage of flight;

(g) pre-take-off/landing signal to cabin crew - PA or chime;

(h) radio aids set and identified (by more than one crew member on multi-crew operations)

(i) RTOW and performance data checked valid for runway in use immediately before take-off;

(j) performance data for approach and landing (normally before commencing descent);

(k) MSA check prior to descent.

10.13 There should be check-list prompts requiring the aircraft commander to brief the flight crew on the following topics:
(a)
Prior to take-off:
(i)
the actions to be taken if an emergency occurs during or immediately after take-off;
(ii)
special techniques for take-off in crosswinds and on wet or otherwise contaminated runways;
(iii) noise abatement procedures;
(iv) selection of radio aids; and
(v)
selection and checking of reduced thrust for take-off, when permitted.

(b)
Prior to landing:
(i)
selection of radio aids;
(ii)
missed approach procedures;
(iii) any special techniques or system configurations for landing; and
(iv) selected alternate for diversion.

NOTE: It is not necessary to include these items in detail if suitable instructions are provided elsewhere. The word 'briefing' is sufficient at the appropriate points in the check-lists.

10.14 Abnormal operation check-lists should include such drills as:
(a)
hydraulic failures;
(b)
fuel system failures;
(c)
air-conditioning/pressurisation failures; and
(d)
electrical system failures.

10.15 Examples of emergency drills to be covered are as follows: (Note - memory actions are annotated M)
-
engine failure on take off
* rejected take off at or before V_1 drill (**M**)
* after V_1 (instruction must be given that drills are **not** to be performed before reaching a minimum safe altitude)
* engine fire/failure after V_1 drills, could include after take off check
-
engine shut down
-
engine fires (**M**)
-
propeller malfunctions (**M**)
-

fuel filter de-icing
-
relighting of turbine engines and relight envelope graph
* instant relight (**M**)
* normal relight
-
restarting reciprocating engines and restart envelope graph
-
bus bar and other serious electrical failures (**M**)
-
pressurization failures
-
emergency descent (**M**)
* to include use of oxygen mask and microphone (**M**)
-
malfunction of power control systems
-
cabin and hold fires

-
smoke removal
* to include maximum IAS for flight with direct vision window open if permissible
-
landing gear fires
-
landing
* with gear asymmetry
* with gear up
* ditching
-
evacuation drills
-
pilot cockpit pre-evacuation drills (**M**) following
* crash landing
* ditching
* rejected take off to be followed by evacuation
* normal landing, or
* at any other time whilst on the ground
-
imminent overrun of manoeuvring area drill (**M**)
-
bomb-on-board warnings.

11
USE AND CHECKING OF ALTIMETERS

11.1 Operators must have a clear policy on altimeter setting procedures, particularly their use of QFE and QNH; this policy must be clearly described in operations manuals to cover all phases of flight.

11.2 This policy must incorporate:
(a)

Pre-flight serviceability tests;
(b)
Flight crew altimeter setting procedures, including:
(i)
the setting to be used for each phase of flight;
(ii)
the correct challenge and response for altimeter cross-check(s), particularly during climb, descent and approach and when nearing an assigned altitude/level;
(iii) alternative settings and procedures, if appropriate, for use when QFE is either not available or cannot be used e.g. at high altitude aerodromes;
(iv) the manner of checking and of use of any radio altimeter(s) ;
(v)
special precautions to be taken if an altimeter is suspect or becomes unserviceable in flight;

(vi) confirmation that, unless special conditions exist, the standard setting procedure will be used irrespective of which seat the handling pilot occupies on take-off;
(vii) the annotation of check lists with the actual setting to be used e.g. QNH/QFE; phrases such as 'altimeters set' should not be used;
(viii) the correct report of altitude/level changes to ATC; such reports should **not** be made before reaching or leaving a particular altitude/level;
(ix) provision for one altimeter to be set to the appropriate QNH, when flying at or near to the MSA; this has particular relevance to single-pilot unpressurised aircraft.
(x)
a check of aerodrome elevation during the approach phase; this is to be cross-checked to establish the difference between QFE and QNH, when QFE is used for landing;
(xi) the procedure for indicating decision heights for landing, e.g. a figure in the navigation log, altimeter 'bugs' and/or landing data cards;
(xii) the requirement for crews to inform ATC prior to its commencement if it is intended to use QNH settings throughout a radar approach procedure;
(xiii) the calls to be made by monitoring pilots or auto calls during instrument approaches i.e. at the outer marker or equivalent, 500 feet above runway elevation, 100 feet above DA/DH or MDA and minima. The calls and responses required for approaches in Category 2 or 3 weather minima conditions will need to be specified in greater detail; and
(xiv) the procedures to be used when flying in airspace where metric units are in use. If no metric altimeter is fitted, detailed instructions must be provided on the method of cross-checking conversions from metres to feet and vice-versa.

12
EMERGENCY EVACUATION PROCEDURES

Procedures for the evacuation of an aircraft and care of passengers following a forced landing, ditching or other emergency are to be specified. Much of the information will be descriptive but the basic drills to be followed by the various members of the aircraft crew must be summarised and tabulated. Particular attention should be paid to the following points:

(a)
the correct setting for pressurisation system controls prior to ditching;

(b)
the ground positioning of the aircraft relative to the wind, wherever possible, to allow for the safest possible evacuation in the event of an aircraft fire;

(c)
the use of emergency escape chutes and evacuation slides/rafts;

(d)
the fitting of life-jackets to small children and the use of flotation cots;

(e)
the briefing of passengers and warning of impact;

(f)
flight deck drills should be memory drills and all flight deck crew members should carry them out in a coordinated manner, when ordered to do so by the captain;

(g)
cabin drills should nominate individual responsibility for initiating evacuation and detail cabin crews' duties inside and outside of the aircraft;

(h)
the location and use of each item of emergency and survival equipment. Any variation between such equipment carried in individual aircraft of the same type must be shown;

(i)
the carriage of disabled passengers, how they are dealt with, should an emergency evacuation of the aircraft be necessary, and any need to carry additional cabin crew; the aircraft commander must be informed when severely disabled persons are on board; and

(j)
the procedure for warning the cabin crews of any emergency which might require the rapid evacuation of passengers from the aircraft.

NOTES: (1) Operators may be required to arrange a demonstration emergency evacuation, if concern arises as to the effectiveness of procedures that are proposed.

(2) If electrical power is maintained or re-applied after an accident or incident, the Flight Data Recorder (FDR) or Cockpit Voice Recorder (CVR) may continue to run and hence obliterate accident or incident data. Crews should wherever possible ensure electrical isolation of the FDR/CVR, particularly if re-applying power.

13
RADIO WATCH

Radio watch instructions must contain the requirement for a continuous watch on operational frequencies not equipped with SELCAL and shall include the requirement for flight crews to monitor distress frequency 121.5 MHz at all times when operationally possible.

14

ROUTE GUIDE

14.1 The route guide provided in accordance with the provisions in Schedule 11 of the AN(HK)O should be a volume or series of volumes separate from the rest of the operations manual. Information in the AIP, AIC, NOTAM and AIRAC shall be taken into account in the development of route guide. Aerad, Jeppesen or similar publications will normally meet the requirement, provided that flight crews are given adequate advice on the route to be followed. An operator providing his own guide should ensure that it meets the needs of crews in every respect. If flights are to be made only on airways or Advisory Routes (ADRs), it will be sufficient to include instructions to that effect; otherwise routes regularly flown should be specified in detail, normally on prepared navigation flight plans. For other flights, routes should be specified in a commander's flight brief, a copy being retained at base.

14.2 Particular care should be taken to ensure that adequate information is provided on search and rescue facilities, obstructions in the approach pattern, radio failure procedures, prohibited and danger areas and standard Terminal Manoeuvring Area (TMA) routeings. Only recognised instrument approach or let-down procedures in general use should normally be included in the flight guide. Exceptionally, a special 'break cloud' procedure proposed by the operator may be considered by the **CAD**, provided it is acceptable to the appropriate Airport Authority. Proposals to use such special procedures, accompanied by the associated aerodrome operating minima, should be submitted to the Flight Operations Inspectorate.

14.2.1 Neither Jeppesen nor Aerad approach plates display the vertical limits of controlled airspace, although this information is available on some area and en-route charts.

14.3 Normally, the cancellation of Instrument Flight Rules (IFR) flight plans at night or in congested terminal areas should be prohibited and instructions to this effect included in the operations manual. If an operator does not wish to impose a total prohibition, detailed instructions should be included in the operations manual, setting out the minimum conditions that must be satisfied before cancellation of an IFR flight plan.

NOTE: Aircraft are not permitted to fly under VFR at night in HK airspace. A visual approach does not require the cancellation of an IFR flight plan (see ICAO definition of visual approach).

14.4 In some circumstances an abbreviated approach procedure may be adopted; the conditions under which this procedure may be followed should be detailed in the operations manual.

14.5 In order to facilitate effective monitoring of an instrument approach by members of the flight crew, operators of multi-crew aircraft should provide for use on the flight deck at least two copies of the Instrument Approach charts to be used.

15

METEOROLOGICAL REPORTS FROM AIRCRAFT

15.1 Reference to meteorological reports from aircraft in flight should be based on the information and guidance in the Hong Kong Aeronautical Information Publication (AIP) and/or on any special requirements of foreign authorities.

15.2 Reference to reports on volcanic activities from aircraft in flight and report made after landing should be based on the information and guidance in the Hong Kong AIP and/or on any special requirements of foreign authorities.

16

MINIMUM SAFE ALTITUDES

16.1 Minimum safe altitudes are to be prescribed by the operator for each sector from take-off, on each route to be flown, including routes to alternate aerodromes. For this purpose ‘sector’ means the intended track from a reporting or turning point to the next, until the aircraft starts the instrument approach procedure or joins the traffic pattern at the aerodrome to be used for landing. Minimum safe altitudes must be specified by the operator in the appropriate volume of the manual, in a prepared navigation flight plan or in the commander’s flight brief.

16.2 To provide the commander with guidance for the calculation of minimum safe altitudes, when he is obliged to depart from the planned or normal route, operators must include a formula in the manual, expressed as simply as possible, from which the minimum safe altitude can be calculated. The formula must secure at least the normal terrain clearance standards laid down by the operator,

16.3 When specifying minimum safe altitudes, operators must take account of local regulations.

16.4 The criteria upon which minimum safe altitudes are based, related to the track guidance facilities available to the commander. The minimum acceptable standards are as below; however such standards are modified when flying over high terrain or when the ambient air temperature is very low. These variations are covered in paragraphs 16.5 and 16.7.

16.4.1 *For general application.* Where the terrain or obstacle is 5000 feet Above Mean Sea Level (AMSL) or lower, the minimum safe altitude is 1000 feet above the highest terrain or obstacle within 20 nm of the route centre line. Where that terrain or obstacle is higher than 5000 feet AMSL, the minimum safe altitude is 2000 feet or more above the highest terrain or obstacle within 20 nm of the route centre line.

16.4.2 *For flight in controlled airspace.* Where the track is well defined by two separate aids, the minimum safe altitude is 1000 feet above the highest terrain or obstacle within 10 nm of the route centre line. Where the highest terrain or obstacle, within 10 nm of the route centre line, is higher than 5000 ft AMSL, the minimum safe altitude is 2000 feet or more above that terrain or obstacle. When the sector length between navigational aids which define turning points is such that the aircraft could be more than 5 nm from the centre line, due to inherent errors in the system used to define an airway, the limit of protection must be increased by the extent to which the divergence exceeds 5 nm.

16.4.3 *For radar controlled flight within 25 nm of the aerodrome of departure or intended landing.* The minimum safe altitude is 1000 feet above the highest terrain or obstacle within 5 nm of the intended track. Commanders must be instructed to monitor all radar instructions by reference to other aids and be reminded that, when under radar control, it is their individual responsibility to ensure adequate terrain clearance. Minimum safe altitudes within 25 nm of aerodromes are referred to as minimum sector altitudes.

16.4.4 *Use of flight guides.* An operator may use minimum safe altitudes and minimum sector altitudes given in a recognised Flight Guide, provided that the basis of the publisher’s calculations will give at least an equal standard to that required by this section. If necessary, corrections can be made and promulgated in the manual so that the prescribed vertical separation is maintained.

16.5 **Corrections to Planned Minimum Safe Altitudes for Flights Over High Ground**
When the selected cruising altitude or flight level or one-engine-inoperative stabilising altitude is at or close to the calculated minimum safe altitude and the flight is within 20 nm of terrain having a maximum elevation exceeding 2000 feet, the previously calculated MSA must be increased as follows:

HEIGHT INCREASE FOR FLIGHT OVER HIGH GROUND

Windspeed in Knots
Elevation of terrain
0-30
31-50
51-70
Over 70
2000-8000 ft
500 ft
1000 ft
1500 ft
2000 ft
Above 8000 ft
1000 ft
1500 ft
2000 ft
2500 ft

NOTE: Relevant instructions must be included in the Operations Manual.

16.6 Manuals must include a reference to the effect of mountain waves on the maintenance of vertical separation and instruct commanders to take suitable precautions when such conditions are reported or forecast.

16.7 Adequate allowances to calculated minimum safe altitudes must be made when the ambient temperature on the surface is much lower than that predicted by the standard atmosphere. When the ambient temperature is lower than International Standard Atmosphere (ISA) -15°C, the following additions to minimum safe altitude must be made:

Lower than
ISA -15°C
Not less than 10%
" "
ISA -30°C
Not less than 20%
" "
ISA -50°C
Not less than 25%

16.8 For any route the maximum altitude obtainable with all power units operating, or the appropriate stabilising altitude with one-engine-inoperative, must be greater than the calculated minimum safe altitude for that route.

17

AERODROME OPERATING MINIMA (AOM) - TAKE OFF AND LANDING

17.1 Minima for airfields in regular use and associated alternates must be listed in the operations manual, for take-off, landing and visual manoeuvring. For airfields visited infrequently the minima may be listed in the commander's brief; a copy must be retained for 6 months.

17.1.1 Operators' instructions on aerodrome operating minima are particularly important. They should be stated clearly for the benefit of flight crew members. The instructions and tables have two purposes:

(a)
to enable the commander to appreciate the operator's intentions and requirements; and

(b)

to decide whether to commence or continue an approach.

17.2 Minima for take-off and landing must be specified for each type of aircraft and for each runway and associated approach aid at each aerodrome. Take-off minima will vary with the performance group of the aircraft. Minimum values acceptable to the **CAD** are shown at Appendix B of this Chapter. Landing minima, and the method of calculation, are also shown at Appendix B. Landing minima can be calculated using different methods from those detailed in this Appendix, but such minima must be no lower than those derived from the Appendix. Operators of helicopters should consult their assigned Inspector.

17.3 It is the responsibility of operators to establish and specify appropriate minima. The **CAD** and its Inspectors cannot assume any responsibility for the minima specified and every instruction issued. The operator must designate a suitably qualified person to keep the instructions under review and amend, as necessary.

17.4 For normal operations (non-LVO) and for Take Off, operators are permitted to use the minimum RVR, as amended by NOTAM, or as published on the appropriate approach or aerodrome charts forming part of their operations manual, whichever is the higher. Subject to the **CAD's** acceptance, operator's obligation to publish AOM may be fulfilled by use of aerodrome and approach charts that have been published using Pans Ops, Terps or other State criteria.

17.5 Guidance on the calculation of landing minima for Category II and III operations is given in **CAD** 359.

17.6 Minima and associated instructions must be presented so that the information is readily available to and easily interpreted by the flight crew.

17.7 Only 'notified' or approved instrument approach procedures may be included in the tables. Runways or landing strips and approach aids which are not authorised for either take-off or landing must be specified either in the AOM tables or by a general instruction.

17.8 For the guidance of commanders, who may be obliged to take off from or land at aerodromes for which values have not been specified, operators must give data and instructions which allow for the calculation of minima. The data and instructions should be expressed as simply as possible and secure, as a minimum the normal operating standards observed by the operator. In these circumstances it may not be practicable for the commander to give the same detailed consideration to all the relevant factors as the operator. Therefore, the minima calculated in this way will usually be higher than those which would have been precalculated. When an aircraft commander calculates AOM in accordance with these criteria, the calculations must be retained with other flight documentation.

17.9 Operators must state that a commander is authorised to exercise discretion and apply minima higher than those prescribed by the operator, when it is necessary to secure the safety of the aircraft.

17.10 Minima for commanders with limited experience on type shall be established.

17.11 **Selection of Alternate Aerodromes**
17.11.1 Alternate aerodromes designated by the operator must be specified either in the manual or in the commander's flight brief. Instructions must be given on the factors to be taken into account by commanders in the selection of alternates for particular flights.
17.11.2 When the weather conditions are below landing minima at the departure aerodrome, take-off is prohibited unless a suitable return alternate is available within a specified time or distance, as set out below:
Number/type of engines
Time/distance at one-engine-inoperative speed
4 turbine
120 minutes or 500 nm) whichever
4 piston
90 minutes or 400 nm) is the less
3 turbine
90 minutes or 400 nm)
3 piston
60 minutes
2 turbine
60 minutes
2 piston
30 minutes
2 turbine (helicopters)
60 minutes
NOTE: For advice on limits for aircraft not included in the table the operator should consult their assigned Inspector.
17.11.3 At the flight planning stage, operators using Category II and Category III equipped aircraft must consider the possibility of a failure preventing this operation and ensure that the alternate chosen, has weather that is forecast to be at or above Category I limits.
17.12 **Take-off Minima**
17.12.1 Minimum conditions for take-off must be specified in terms of Runway Visual Range (RVR) and, where State Minima requires, cloud ceiling, and full account taken of all relevant factors. See paragraph 2.5 of Appendix B to this chapter for procedure when RVR is not reported. Factoring of meteorological visibility for take-off is not permitted.
17.12.2 Special rules applicable to certain types of aircraft are discussed in paragraph 17.16.
17.13 **Landing Minima**
17.13.1 *The Approach Ban.* A statement must be made setting out in what circumstances an approach may or may not be started or continued, based on the provisions of the AN(HK)O. The approach ban is applied to all intended approaches to land by a public transport aircraft. In effect, an aircraft making an approach to land may only descend below 1000 ft above the aerodrome elevation when the RVR, factored meteorological visibility or meteorological visibility reported for the intended runway or direction of landing is equal to or better than the minimum RVR or visibility specified for that runway or direction of landing, appropriate to the type of approach i.e. precision, non-precision or visual. The ban will apply even when the specified visual reference, as distinct from RVR, may have been achieved at or above 1000 ft above the aerodrome. Also an aircraft shall not continue an approach to land by flying below the relevant specified Decision Height/Altitude or the relevant specified Minimum Descent Height/Altitude, unless from that height/altitude the specified visual reference for landing is established and is maintained.

17.13.2 *Decision Height/Altitude and Minimum Descent Height/Altitude.* A Decision Height/Altitude (DH/A) or a Minimum Descent Height/ Altitude (MDH/A) must be specified for each precision and non-precision instrument approach procedure respectively for each runway or landing strip used. In determining the appropriate height or altitude, account must be taken of all relevant factors. The method of calculation is described at Appendix B of this Chapter.
17.13.3 *Runway Visual Range (RVR).* Minimum values of RVR must be specified by the operator. For aerodromes and runways where RVR is not measured, operators must specify the minimum reported visibility below which an approach to land cannot be commenced or continued. The relationship between RVR and meteorological visibility is shown at Appendix B of this Chapter.
17.13.4 *Increments to minima.* These are to be applied to specified values of DH/A, MDH/A and RVR for commanders with only limited experience on the type of aircraft. Appropriate increments must also be applied when any unserviceability of instrumentation or systems significantly affects the performance and/or handling of the aircraft.
17.14 **Minima for Visual Landing**
17.14.1 RVR or equivalent RVR or meteorological visibility must be established for all types of approaches to any runway; these minima apply also to partial or complete visual circuit and cloud break procedures. Details are given at Appendix B of this Chapter.
17.14.2 Minima consisting of an MDH/A, flight visibility, RVR or equivalent and a visual reference are to be specified for an instrument approach procedure to be followed by visual manoeuvring (circling) for landing. These minima apply where a pilot uses a radio aid to position, to within sight of the aerodrome, and then makes a partial circuit or other significant manoeuvre to line up for the approach and landing, e.g. a change of track of more than 30°.
17.14.3 The minimum height for all forms of circling is determined by reference to the relevant chart or AIP, consistent with the handling and performance characteristics of the aircraft. Absolute minima are given at Appendix B of this Chapter.
17.14.4 At some aerodromes it is necessary to restrict circling to a particular segment of the circuit, e.g. north of the extended centreline only, because of major obstacles or high ground. Any such restriction must be clearly indicated in the lists of operating minima.
17.14.5 For a visual circuit after a visual approach or when manoeuvring after an instrument approach, visual contact must be maintained with the ground. This will allow the aircraft to be positioned in relation to the aerodrome and remain within any notified visual manoeuvring area. Exceptionally, if visual reference is lost when circling to land from an instrument approach, the missed approach specified for that particular procedure must be followed. An initial climbing turn will be made towards the landing runway and, when overhead the aerodrome, establish the aircraft climbing on the missed approach track. As the circling manoeuvre may be accomplished in more than one direction and depending when visual reference is lost, different patterns will be required to establish the aircraft on the prescribed missed approach course.

17.15 **Specification of Visual Reference**
17.15.1 For precision approaches, instructions must be given on the minimum visual reference required at Decision Height (DH) or Decision Altitude (DA) and thereafter. The visual

reference segment must contain sufficient physical features so that the aircraft's position relative to the desired flight path can be identified. It must include an element for lateral control, e.g. a cross bar of the Calvert approach lighting system or barrettes on approach lighting systems, where there are no cross bars.

17.15.2 The specified visual segment of a full Category II or III approach should contain the appropriate number of runway or approach lights.

17.15.3 For approaches using other aids and, when approach lighting is not available, the specified visual reference must include the desired point of touchdown, the "aiming point", on the runway of intended landing. If approach lights are available, it is not essential that the aiming point is in view at the MDH/A but the segment of lighting specified must contain at least 7 lights, which may be approach lights or runway lights or a combination of both.

17.15.4 Specifying visual references in diagrammatic form is permitted, provided that the specifications meet the above criteria.

17.16 **Special Rules for Certain Aircraft**

Certain groups of aircraft are subject to special statutory provisions in respect of aerodrome operating minima (see Schedule 15 of AN(HK)O). These limitations should be taken into account in establishing minima, which should be marked where necessary for operations by day only. If the operator's limitations because of the effect of the Regulations - are based on a specially reduced take-off weight, this must be indicated clearly in the listed minima.

17.17 **Aerodromes Without Approach Aids**

A statement must be made in the operations manual that aeroplanes with a maximum total weight exceeding 5700 kg, engaged in the public transport of passengers, are prohibited from operating into and out of an aerodrome not equipped with radio and a radio navigation aid, either at the aerodrome or elsewhere, to assist in the location of and approach to the aerodrome. Operators wishing to develop an instrument approach procedure at an aerodrome without approved aids should contact their assigned Operations Inspector.

17.18 **State and Special Minima at Foreign Aerodromes**

17.18.1 Most foreign countries set mandatory operating minima which require compliance. In some instances, however, the authorities may permit the use of lower minima, on application by a Hong Kong operator and in consultation with the **CAD**.

17.18.2 It is the responsibility of the operator to make a fresh application for special minima following changes in aerodrome facilities or other factors.

17.19 **Heliport Operating Minima**

17.19.1 No approach to land under instrument flying conditions to any heliport when the visibility is below 800M should be carried out unless RVR information or other means of accurate information is available.

18
HELICOPTER OPERATIONS OVER WATER

Cancelled –refers to CAD 360 Helicopter Supplement

19
LOADING

19.1 **Loading Instructions**

In order to carry cargo in what would normally be the passenger cabin an approved modification is usually necessary, taking into account the airworthiness requirements for the particular type of aircraft and the flight manual limitations.

NOTE: The requirements to be satisfied in order to gain approval for the carriage of

cargo in passenger compartments are given in **CAD** 360 Part 2 Chapter 4.
19.1.1 The approval reference number of the appropriate approved modification must be shown in the operations manual or, if the **CAD** has deemed that a modification is not necessary, the basis for the **CAD's** acceptance.
19.1.2 Where no approval/acceptance has been granted and shown in the manual, cargo must not be carried other than in designated cargo compartments.
19.1.3 Instructions must provide guidance for traffic staff, handling agents and aircraft crew, as appropriate, on the loading, weight and balance of an aircraft and include instructions on:

(a)
Controlling and promulgating the basic or Aircraft Prepared for Service (APS) weights and indices. Where used, all items of equipment that convert basic to APS weight must be listed;

(b)
regulating the carriage and stowage of baggage and cargo in passenger compartments, including instructions on the amount of hand baggage allowed and how it is to be stowed. Emergency exits, gangways and dinghy launching stations must be kept clear during taxying, take-off and landing;

(c)
carriage of Dangerous Goods;

(d)
limitations on floor loading, the strength and distribution of attachment points, use of weight spreading devices and positioning and securing of ballast;

(e)
checking that items of cargo or baggage allocated to particular compartments or holds are distributed and restrained correctly. The person responsible for the trim of the aircraft must give written instructions to the person responsible for loading the aircraft;

(f)
advising the aircraft commander and cabin crew of seating restrictions;

(g)
the effect of the maximum zero fuel weight, landing weight restrictions at planned destination, take off and climb performance requirements at the departure aerodrome and en route performance requirements on Regulated Take-Off Weight (RTOW);

(h)
the care and maintenance of Unit Load Devices (ULD), responsibilities for ensuring their fitness for use prior to loading and the procedure for directing damaged units to an approved organisation for repair;

(i)
fuel loading limitations;

(j)
where appropriate, limitations on loading for ferrying aircraft with one engine inoperative, Certificate of Airworthiness (C of A) tests or any other non-standard flight; and

(k)
where applicable, the use of the standard weights or any notional weights given in exemptions granted by the **CAD**.

19.2 **Cargo Loading Instructions**

These instructions must include the following additional details:
(a)
diagrams and dimensions of cabin bays and cargo holds and compartments to facilitate the pre-planning of cargo distribution;
(b)
the strength and usable directions of all lashing points and/ or rings and details of the spacing between lashing points;
(c)
the types and working strengths of lashing provided, and stowage, when not in use;
(d)
instructions concerning the loading of stretchers, carriage of livestock or other unusual loads;
(e)
where appropriate, the handling, loading and securing of pallets or containers;
(f)
a care and maintenance programme for ULDs; these include cargo containers, nets and pallets. Guidance must be given to both loading and maintenance personnel on the division of duties in respect of ULD serviceability;
(g)
instructions on the use of passenger aircraft for the carriage of cargo;
(h)
guidance on the duties and responsibilities of individuals when making cabin configuration changes. These changes require a Certificate of Release to Service (CRS). Further information on these procedures can be obtained from the Airworthiness Office;
(i)
where appropriate, instructions on the loading and securing of mail bags or similar cargo, including checking for leakage or spillage and consequential aircraft contamination; and
(j)
a statement that a load/trim sheet cannot serve as a loading instruction and a trim slide rule does not dispense with the requirement to complete a load sheet.

19.3 The position of the laden centre of gravity must be given on the load sheet. For this purpose, a trim sheet may be regarded as part of the load sheet, even though it can be a separate document. The complete document must include particulars of how the load is distributed and special attention paid to the wording of the loading certificate. This may be met by establishing that the Centre of Gravity (C of G) lies within the permitted limits and it is not necessary to determine the precise position, unless it affects aircraft handling or other factors. The load sheet must bear the reference of the APS form used and, if standard weights have been used, an endorsement to that effect.
19.4 Where a 'loading plan' method is used, the basic assumptions upon which the plan is formulated must be given and must specify C of G limits more stringent than those permissible under the C of A. It must also be stated that loading in accordance with the 'plan' ensures that the laden C of G always falls within the restricted limits. If this is done, a simple statement on the load sheet that the laden C of G is between the operator's more stringent limits is acceptable.
19.5 Operators must provide traffic staff and handling agents, including agents at overseas aerodromes, with:

(a)
loading instructions, including the principles of effective cargo restraint;
(b)
current APS forms for all types, marks and variants of aircraft used; and
(c)
details of the RTOW and fuel load for each flight.

19.6 Where traffic staff and handling agents are responsible for calculating the RTOW, operators must ensure that they are provided with all relevant information and are competent.

19.7 **Loadsheet Contents**

19.7.1 The load sheet, together with the APS form, must account for all items of the laden weight. Although they may not always be specified individually, the following are examples of items to be included:
(a)
Fuel, water methanol, oil, hydraulic fluid, drinking water, toilet water, de-icing fluid;
(b)
passenger seats, children's cots, cabin floor covering, removable bulkheads;
(c)
galley equipment including urns, hot cups;
(d)
food and beverages to be consumed in flight;
(e)
bar stocks including the weight of the boxes or other containers;
(f)
navigation bag or aircraft library and navigation equipment, unless these items are included in the APS weight;
(g)
passengers' hold baggage;
(h)
passengers' cabin baggage, unless this is accounted for elsewhere;
(i)
flight spares and tools, spare hydraulic or de-icing fluid;
(j)
cargo;

(k)
aircraft crew baggage;
(l)
dinghies, all life-jackets flotation cots, survival packs, blankets, pillows and similar equipment;
(m) load spreading devices, lashing, ballast;
(n)
all items of removable equipment and removable radios carried; and
(o)
when livestock is carried, food and necessary equipment.

19.8 Loadsheets must show whether actual, standard, or approved notional weights of passengers and their baggage are used.

19.9 **Helicopter Loading**

Cancelled – refers to CAD 360 Helicopter Supplement

20
DANGEROUS GOODS, WEAPONS AND MUNITIONS OF WAR
20.1 **Carriage of Dangerous Goods**
20.1.1 The Air Navigation (Dangerous Goods) Regulations set out the applicable requirements, including those relating to operators' responsibilities. They require that a written permission be issued by the **CAD** before the operators are authorized to carry dangerous goods (DG) and such goods are carried in accordance with the International Civil Aviation Organisation (ICAO) Technical Instructions for the Safe Transport of Dangerous Goods by Air (Doc 9284).
20.1.2 Such DG Permission is granted by the **CAD** Dangerous Goods Office when the **CAD** is satisfied as to the adequacy of staff training and procedures. Following the grant of DG Permission, the operator should also check their AOC to see if an AOC variation is required and contact the **CAD** Flight Standards and Airworthiness Office where needed.
20.1.3 Detailed requirements of crew and staff training and procedures can be found in Appendix 2 to ICAO Annex 6, Schedule 16 to AN(HK)O, Annex 18, Doc 9284 and Emergency Response Guidance for Aircraft Incidents Involving Dangerous Goods (Doc 9481) [Remarks: The latter four are comprehensive requirements for the safe transportation of DG for all relevant personnel, e.g. staff of operators, shippers, and are being enforced by **CAD** Dangerous Goods Office].
20.1.4 Certain items described generally as DG do not require a Permission for carriage. These include aircraft equipment and stores, certain items carried by passengers or crew and items required for use in flight to provide veterinary aid to an animal or medical aid to a person. Guidance must be given on what items can be carried in all these circumstances.

20.1.5 Operations manuals must state whether or not a Permission for the carriage of DG is held.
20.1.6 Where a Permission is not held, DG information and instructions in accordance with Schedule 11 to AN(HK)O and Appendix 2 to ICAO Annex 6 must still be included in the operations manual. Other relevant staff training and procedures applicable to these operators not authorized to carry DG (such as procedures to prevent the inadvertent carriage of undeclared DG on board aircraft specified under ICAO Doc 9284 or emergency procedures specified under Doc 9481) must be included in the appropriate manuals.
20.1.7 Where a Permission for the carriage of DG is held, DG information must be given to enable operator's staff or the ground handling agent to carry out their responsibilities. The instructions apply from the time DG are accepted for carriage until they cease to be in the care of the operator or ground handling agent. Operators and their handling agents are expected to observe other relevant DG storage requirements as stipulated by the Fire Services Department in Hong Kong or other competent authorities at outstations. The general guidelines on DG storage in Hong Kong are in Appendix F to this chapter.
20.1.8 Accidents and incidents arising from the carriage of dangerous goods are reportable under the Mandatory Occurrence Reporting Scheme (see paragraph 24).
20.1.9 Detailed DG requirements are stipulated in Schedule 16 to the AN(HK)O, ICAO Doc 9284 and ICAO Doc 9481. Please contact the **CAD** Dangerous Goods Office for further advice.
20.2 **Carriage of Weapons and Munitions of War (MUW)**
20.2.1 Munitions of war shall only be carried with the written permission of the **CAD**.

Munitions of war are any weapon, ammunition or article containing an explosive or noxious liquid, gas or other thing which is designed or made for use in warfare or against persons, including parts, whether components or accessories, for such weapon, ammunition or article. In Hong Kong, MUW on board aircraft are mostly arms and ammunition for law enforcement, sporting and filming use.

20.2.2 Accidents and incidents arising from the carriage of weapons and munitions of war are reportable under the Mandatory Occurrence Reporting Scheme (see paragraph 24).

21

CARRIAGE OF ANIMALS

21.1 **General**

21.1.1 Operators who intend to carry animals must hold a current edition of the International Air Transport Association (IATA) Live Animals Regulations. The Regulations give guidance on such matters as the types of containers that should be used, labelling and marking of containers, animal health and hygiene, feeding, loading and sedation.

21.2 **Livestock, Horses and Other Large Animals**

21.2.1 Where livestock or other large animals are carried, the information must be given on action in emergencies, as well as the carriage and use of animal first aid and emergency kits, including the use of the captive bolt humane killer.

21.2.2 The determination of the weight of the consignment and where this weight is recorded on the load-sheet must be given. Guidance on loading should include:

(a) the weight, dimensions, construction, method of attachment and required restraint for horse boxes or animal pens;

(b) the checks necessary, before loading horse boxes or animal pens, on the general condition and serviceability of fitting and lashing points;

(c) the loading of horse boxes and the tethering of horses;

(d) the stowage of loose equipment such as food and water containers and horse paraphernalia; and

(e) the number and type of food and water containers and the quantities of food and water required, based on the duration of the flight and the number of animals carried.

21.2.3 Instructions must be given on checking an aircraft after a flight on which livestock, horses or other large animals have been carried for damage to the structure, fittings, wiring etc and for any adverse effects resulting from high humidity and urination.

21.2.4 When horses are carried, the minimum number of grooms for particular loading configurations must be specified.

22

GROUND HANDLING AND AIRCRAFT DISPATCH

22.1 Operators are responsible for the safe dispatch of their aircraft following cargo and passenger loading, refuelling, cleaning, catering and the completion of preflight maintenance and servicing. Any damage to the aircraft must be reported and assessed for airworthiness significance prior to flight.

22.2 Instructions must be given to ensure that dispatch tasks are carried out in a standard manner, that each task is fully and correctly completed, and that any damage is reported immediately.

22.3 Instructions on training requirements, subcontracting policies, handling processes, procedures and practices for all ground handling operations should be developed in the form of a Ground / Aircraft Handling Manual.
22.4 Where dispatch tasks are contracted out to other organisations, contracts must include the operator's requirements for safe conduct of the task and the performance of the contractor, in respect of safety, must be monitored regularly. Even when all or part of the functions and tasks have been contracted to contractor, operators' ground handling responsibility must be permanently maintained.

23
ACCIDENT PREVENTION AND FLIGHT SAFETY

23.1 Operators are to establish and maintain accident prevention and flight safety programmes under the supervision of a person specifically nominated for the purpose. Operators should refer to **CAD** 739, which contains information and guidance on Flight Data Analysis Programmes.
Note: Guidance on accident prevention is also contained in ICAO Doc 9422 - 'Accident Prevention Manual'.

24
ACCIDENT REPORTING

24.1 Provision must be made for all operating staff to have ready access to the prescribed requirements for the reporting and investigation of accidents. In particular, operating staff should be familiar with the definitions used in the legislation, the duty to furnish information, and the rules governing the removal of damaged aircraft.
24.2 Instructions must be issued on the reporting of accidents occurring overseas to the regulating authority of the country concerned and the action necessary to prevent removal or interference with any part of the aircraft without proper permission. This is in addition to operators' existing responsibility to inform the Chief Inspector of Accidents, Civil Aviation Department. The operations manual should contain the address and telephone numbers of the Department.
24.3 If doubt exists on whether an occurrence is an accident or an incident, it should be reported to the Department who will decide on its classification.
24.4 An operator shall ensure, to the extent possible, in the event the aircraft becomes involved in an accident or incident, the preservation of all related flight recorder records and, if necessary, the associated flight recorders, and their retention in safe custody pending their disposition as determined in accordance with Hong Kong Civil Aviation (Investigation of Accidents) Regulations. Flight recorder means flight data recorder and/or cockpit voice recorder, where applicable.
24.5 To preserve flight recorder records, flight recorders shall be de-activated upon completion of flight time following an accident or incident. The flight recorders shall not be re-activated before their disposition as determined by the Inspector of Accidents in accordance with Hong Kong Civil Aviation (Investigation of Accidents) Regulations. Flight recorder means flight data recorder and/or cockpit voice recorder, where applicable.
24.6 Documentation concerning parameter allocation, conversion equations, periodic calibration and other serviceability/maintenance information of the flight data recorder should be maintained by the operator. The documentation must be sufficient to ensure that accident investigation authorities have the necessary information to read the data in engineering units.

25

OCCURRENCE REPORTING

25.1 Operators and commanders of Hong Kong registered public transport aircraft shall submit to the **CAD** without delay, a report of any act of unlawful interference or any other occurrence which may endanger or, unless corrected, would have endangered an aircraft. Types of occurrence which must be reported are prescribed in the Air Navigation (General) Regulations.

25.2 Operations manuals must specify the persons responsible for raising occurrence reports and give such guidance as will enable them to comply with the statutory requirements.

25.3 Operators of aircraft that do not fall within the MOR scheme should include instructions in the manuals on the procedure for the reporting of incidents.

25.4 Any accident notified in pursuance of the Hong Kong Civil Aviation (Investigation of Accidents) Regulations shall not constitute a reportable occurrence for the purpose of Mandatory Occurrence Reporting.

25.5 Operators must give guidance on the submission of Mandatory Occurrence Reports (MORs) relating to Extended Range Twin Operations (ETOPS) aircraft. Any occurrence report on aircraft types subject to ETOPS approval, must be prominently annotated ‘ETOPS’.

26

LOW VISIBILITY OPERATIONS (LVO)

26.1 Operators wishing to operate to Categories II or III limits are to submit their proposed procedures to **CAD** for acceptance, prior to including such procedures in their operations manual. HKCAD requirements for LVO are contained in **CAD** 359.

27

EXTENDED RANGE TWIN-ENGINED OPERATIONS (ETOPS)

27.1 Operators wishing to operate twin-engined aircraft for more than 60 minutes from an alternate airport and which are not limited by the certificate of airworthiness to the carriage of less than 20 passengers (ANHKO Schedule 15 regulation 4(5)), are to submit their proposed procedures to **CAD** prior to including such procedures in their operations manual, in order that permission may be granted. HKCAD requirements for ETOPS are contained in **CAD** 513 for extended operations up to 180 minutes. Any extension beyond 180 minutes will be considered by HKCAD and subject to operator's compliance with information contained in FAA Advisory Circular No. 120-42B.

28

EXTENDED RANGE TWIN-ENGINED OPERATIONS – (NON-ETOPS)

28.1 Operators wishing to operate twin-engined aircraft for more than 90 minutes flying time in still air at the all power units economical cruising speed from a suitable en-route alternate aerodrome and which are limited by the certificate of airworthiness to the carriage of less than 20 passengers, are to submit their proposed procedures together with a safety assessment of the aircraft one engine inoperative capability to **CAD**, requesting an exemption to the ANHKO Schedule 15 regulation 4(5).

29
MIXED FLEET FLYING (MFF)
29.1 Operators wishing to conduct MFF are to submit their proposed procedures for MFF training and MFF operations to **CAD** for approval, prior to including such procedures in their operations manual. **CAD** guidelines for MFF are outlined at Appendix G.
30
COMMUNICATION AND NAVIGATION EQUIPMENT
30.1 Communication Equipment
30.1.1 An aeroplane or a helicopter shall be provided with radio communication equipment capable of:
(a)
conducting two-way communication for aerodrome control purposes;
(b)
receiving meteorological information at any time during flight; and
(c)
conducting two-way communication at any time during flight with at least one aeronautical station and with such other aeronautical stations and on which frequencies as may be prescribed by the appropriate authority.
30.1.2 The radio communication equipment required in accordance with the above paragraph shall provide for communications on the aeronautical emergency frequency 121.5 MHz.
30.1.3 **[Paragraph reserved for Required Communication Performance (RCP)]**
Note: In accordance with Article 14 of AN(HK)O, the aircraft shall be equipped with radio and radio navigation equipment required by Schedule 6 of AN(HK)O and the equipments installed in aircraft shall be approved by the **CAD**.
30.2 Navigation Equipment
30.2.1 An aeroplane or a helicopter shall be provided with navigation equipment which enable it to proceed:
(a)
in accordance with its operational flight plan; and
(b)
in accordance with the requirements of air traffic services.
Except when, if not so precluded by the appropriate authority, navigation for flights under the visual flight rules is accomplished by visual reference to landmarks.
Note: In accordance with Article 18(4) of AN(HK)O, an aircraft for public transport shall carry navigational equipment approved by the **CAD** when operating to areas specified in Schedule 8 of AN(HK)O. Also, in accordance with Article 14 of AN(HK)O, the aircraft shall be equipped with radio and radio navigation equipment required by Schedule 6 of AN(HK)O and the equipments installed in aircraft shall be approved by the **CAD**.

30.2.2 For operations where a navigation specification for performance-based navigation (PBN) (i.e. required navigation performance (RNP) or area navigation (RNAV)) specification has been prescribed, an aeroplane or a helicopter shall:
(a)
be provided with navigation equipment which will enable it to operate in accordance with the prescribed navigation specifications; and
(b)
be approved by the **CAD** for operations in such airspace in accordance with Article 36A of AN(HK)O.
Note: All operators requiring PBN approval shall apply to the **CAD** using the

appropriate DCA Form (e.g. DCA 4046 to DCA 4047) which could be downloaded from **CAD** website http://www.**cad**.gov.hk/english/applications.html/, and refer to the guidance on implementation and operational approval in the ICAO Performance-based Navigation Manual (Doc 9613).

30.2.3 For flights in defined portions of airspace where, based on Regional Air Navigation Agreement, minimum navigation performance specification (MNPS) are prescribed, an aeroplane shall be provided with navigation equipment which:

(a) continuously provides indications to the flight crew of adherence to or departure from track to the required degree of accuracy at any point along that track; and

(b) has been approved by the **CAD** for MNPS operations concerned in accordance with Article 36 of AN(HK)O for all aircraft operating through the MNPS airspace as prescribed in Schedule 15 of AN(HK)O.

Note: The prescribed MNPS and the procedures governing their application are published in the Regional Supplementary Procedures (Doc 7030) and those for the North Atlantic MNPS Airspace are in the current edition of the "Guidance concerning Air Navigation and above the North Atlantic MNPS Airspace" (NAT 007) (see an example of MNPS airspace in North Atlantic map in Chap 4 Appendix A).

31 REDUCED VERTICAL SEPARATION MINIMA (RVSM) OPERATIONS

31.1 Operators wishing to operate in RVSM airspace are required to submit their proposed procedures to **CAD** for acceptance, prior to including such procedures in their operations manual. Guidance material may be found in ICAO Doc. 7030, Regional Supplementary Procedures and ICAO Doc. 9574, Manual on Implementation of a 300 M (1000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive. All operators requiring RVSM approval shall apply to **CAD** using Form DCA4040 which is available in **CAD** FSAD Office.

31.2 For flights in RVSM airspace, an aircraft shall be provided with equipment which is capable of:

(a) indicating to the flight crew the flight level being flown;

(b) automatically maintaining a selected flight level;

(c) providing an alert to the flight crew when a deviation occurs from the selected flight level. The threshold for the alert shall not exceed ±90 m (300 ft);

(d) automatically reporting pressure-altitude; and

(e) the aircraft shall demonstrate a vertical navigation performance in accordance with ICAO Annex 6 Part 1 Appendix 4.

31.3 The criteria for granting the RVSM approval are:

(a)
the vertical navigation performance capability of the aeroplane satisfies the requirements specified in ICAO Annex 6 Part I Appendix 4;
(b)
the operator has instituted appropriate procedures in respect of continuing airworthiness (maintenance and repair) practices and programmes (Reference can be made to the document mentioned in the note below); and
(c)
the operator has instituted appropriate flight crew procedures for operations in RVSM airspace (Reference can be made to the document mentioned in the note below).

Note: JAA Administrative & Guidance Material, Section One: General Part 3: Temporary Guidance Leaflet No. 6 is used as the reference acceptance criteria for granting the RVSM approval.

31.4 An operator with a RVSM approval must make arrangement to monitor the height-keeping performance of their aircraft on an on-going basis. As a minimum, the operator shall monitor the height-keeping performance of two aeroplanes of each aircraft type grouping at least once every two years or within intervals of 1,000 flight hours per aeroplane, whichever period is longer. If an operator aircraft type grouping consists of a single aeroplane, monitoring of that aeroplane shall be accomplished within the specified period of 2 years. The operator should establish a monitoring schedule for different aircraft group and provide **CAD** with the monitoring data and monitoring methodology on an annual basis or when required.

Note: Monitoring data from any regional monitoring agencies established in accordance with Annex 11, 3.3.5.2 may be used to satisfy the requirement.

31.5 Additional airworthiness requirements can be found in the Airworthiness Notice (http://www.**cad**.gov.hk/english/HKAN.html).

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32 COSMIC RADIATION

32.1 Operators of public transport aircraft registered in Hong Kong shall, in respect of any flight by that aircraft during which it may fly at an altitude in excess of 26,000 ft, keep a record of the total dose of cosmic radiation to which the crew are exposed together with the names of that crew. The crew has the meaning assigned to it by Article 98 paragraph (4) of the Air Navigation (Hong Kong) Order 1995.

32.2 Where the record (e.g. CARI-6 computer programme) indicates that a crewmember may achieve exposure of more than 4mSv in any 12 calendar month period, then that crewmember should be rostered accordingly to ensure that his/her annual exposure does not exceed 6mSv.

32.3 For flights intended to be operated above 49,000 ft, operators, as defined in paragraph 32.1 above, are required to:
(a)
apply to **CAD** for an exemption from Scale W of Schedule 5 of the Air Navigation (Hong Kong) Order 1995;
(b)
provide information which will enable the pilot to determine the best course of action to take in the event of exposure to solar cosmic radiation; and
(c)
develop procedures in the event that a decision to descend is taken, covering:
-

the necessity of giving the appropriate ATS unit, prior warning of the situation and of obtaining a provisional decent clearance;

-

the action to be taken in the event that communication with the ATS unit cannot be established or is interrupted.

32.4 **CAD** Operations Inspectors will review cosmic radiation records when conducting AOC inspections.

33

INTERCEPTION PROCEDURE

In accordance with the AN(HK)O Schedule 12, a copy of the following notified procedures must be carried on board the aircraft:

(a)

Procedures to be followed by the pilot in command of an intercepted aircraft; and

(b)

notified visual signals for use by intercepting and intercepted aircraft.

For instance, these are available in reference publications such as the Hong Kong Aeronautical Information Publication (AIP) and the Aerad Flight Guide Supplement.

34

ELECTRONIC FLIGHT BAG (EFB) OPERATIONS

34.1 Traditionally all documentation and information available to flight crew for use on the flight deck have been in paper format. Much of this information is now available in electronic format. Operators wishing to operate EFB are to submit their proposed procedures to the **CAD** for acceptance, prior to including such procedures in their operations manual.

34.2 The assessment to the application of EFB Operational Approval is based on JAA Administrative & Guidance Material, Section Four Part Three, Temporary Guidance Leaflet (TGL) No. 36. All operators requiring EFB approval shall apply to the **CAD** using Form DCA4041 which is available in **CAD** FSAD Office.

35

HEAD-UP DISPLAYS (HUD) AND ENHANCED VISION SYSTEMS (EVS) OPERATIONS

35.1 Under ICAO Annex 6 Part I, EVS means a system to display electronic real-time images of the external scene achieved through the use of image sensors, whereas HUD means a display system that presents flight information into the pilot's forward field of view.

35.2 When aeroplanes or helicopters are equipped with HUD and/or EVS, operators shall include the instructions and training requirements for the use of HUD and EVS equipment in the operations and/or training manuals where applicable.

35.3 When operators wish to use HUD and/or EVS to gain operational benefit, such as operating in visibilities lower than the normal aerodrome operating minima or heliport operating minima (i.e. lower minima for approach and landing operations), approval must be obtained from **CAD** in writing prior to the use of such systems. To support such approval, the instructions and training requirements, and also the instructions for determining the aerodrome operating minima or heliport operating minima for instrument approaches using HUD and EVS shall be included in the operations and/or training manuals.

Note: Guidance on HUD and EVS is contained in ICAO Annex 6 Part I Attachment J.

36

AUTOMATIC DEPENDENT SURVEILLANCE BROADCAST (ADS-B) OUT OPERATIONS

36.1 ICAO's Asia-Pacific Regional Group has decided to use the 1090MHz (Mode S) Extended Squitter datalink as the globally interoperable link for ADS-B operations. ICAO has also issued a number of technical and operational standards to support its introduction.

36.2 Operators wishing to operate in ADS-B airspace are to submit their proposed procedures to **CAD** for acceptance, prior to including such procedures in their operations manual. All operators requiring ADS-B approval shall apply to the **CAD** using Form DCA4042 which could be downloaded from **CAD** website at http://www.**cad**.gov.hk/english/applications.html.

36.3 For flights in ADS-B airspace, an aircraft shall be equipped with either:

(a)

The ADS-B equipages that have been certificated as meeting EASA Acceptable Means of Compliance AMC 20-24 'Certification Considerations for Enhanced ATS in Non-Radar Areas using ADS-B Surveillance (ADS-B-NRA) via 1090 MHZ Extended Squitter', or

(b)

The ADS-B equipages that meet the equipment configuration standards of Australia Civil Aviation Order 20.18 Appendix XI.

36.4 The criteria for granting the ADS-B approval are:

(a)

The continuing airworthiness of ADS-B system must be assured. As part of the operational approval process, existing established maintenance practices or a proposed maintenance programme for the aircraft needs to be reviewed to ensure that it meets relevant requirements;

(b)

The Minimum Equipment List needs to reflect the functional requirements of the ADS-B system;

(c)

Appropriate flight operations training programme and operational procedures are established to ensure that pilots are knowledgeable about ADS-B operations and their onboard operational equipment.

Note: EASA Acceptable Means of Compliance AMC 20-24 is used as the reference acceptance criteria for granting the ADS-B approval.

37

OPERATING FACILITIES

37.1 An operator shall ensure that a flight will not be commenced unless it has been ascertained by every reasonable means available that the ground and/or water facilities available and directly required on such flight, for the safe operation of aircraft and the protection of the passengers, are adequate for the type of operation under which the flight is to be conducted and are adequately operated for this purpose. The relevant provisions for compliance by operators are in the AN(HK)O.

37.2 An operator shall ensure that any inadequacy of facilities observed in the course of operations is reported to the authority responsible for them, without undue delay.

37.3 An operator shall, as part of its safety management system, assess the level of rescue and fire fighting service (RFFS) protection available at any aerodrome intended to be specified in the operational flight plan in order to ensure that an acceptable level of protection is available for the aeroplane intended to be used.

37.4 Information related to the level of RFFS protection that is deemed acceptable by the operator shall be contained in the operations manual after acceptance by the **CAD**.
NOTE: Appendix C of this chapter reproduced ICAO Annex 6 Part I Attachment K which contains guidance on assessing an acceptable level of RFFS protection at aerodromes.

CHAPTER 4 APPENDIX A - NORTH ATLANTIC MNPS AIRSPACE

NOTE: The boundaries shown were **for reference only** and correct at the time of publication in November 2000 (Amdt 9), but operators must confirm the current co-ordinates of MNPS and Schedule 8 areas specified in AN(HK)O 1995.

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CHAPTER 4 APPENDIX B - AERODROME OPERATING MINIMA CALCULATIONS

1 DEFINITIONS

1.1
'Notified' for the purposes of this Appendix means set forth in a document entitled 'Aeronautical Information Publication' or 'NOTAM', published by the Civil Aviation Department or by any other civil aviation authority and for the time being in force. 'Specified' means specified by the operator in the operations manual.

1.2
The meaning of the expressions Decision Height, Minimum Descent Height, Precision Approach and non-Precision Approach, are as defined in the ANO. Missed Approach Point (MAP) is defined by ICAO as 'that point in an instrument approach procedure at or before which the prescribed missed approach procedure must be initiated in order to ensure that the minimum obstacle clearance is not infringed'.

2 TAKE OFF MINIMA - AEROPLANES IN PERFORMANCE GROUPS A, B, C, E, F AND X

2.1
This paragraph is designed to assist operators in the preparation of Take-Off Minima (TOM) for inclusion in operations manuals.
2.2
Each airfield and runway on that airfield that is used regularly for take-offs should be allocated TOM which take into account the Performance Group of the aeroplane and the runway lighting and markings available. Where an airfield is little used, operators should either issue TOM for that airfield or provide the aeroplane commander with guidance on how to calculate the minima. TOM that are not published in the manuals should be retained with the aeroplane documentation for a period of 3 months subsequent to the flight.
2.3
The figures published in the Table are considered the minimum to which aeroplanes can operate with a reasonable degree of safety. Operators may calculate the TOM for their aeroplane by whatever means they wish, but the figures arrived at should not be less than those listed, except when provided for in Notes 1, 2 and 3 below. The values given for aeroplanes in Groups C, E and F assume that sufficient runway remains for an immediate re-land ahead prior to the engine inoperative net flight path or en-route climb configuration and speed being achieved, or that no obstacles are in the take-off direction of the aeroplane.

TAKE-OFF MINIMA

Airworthiness Performance Group	*Performance Groups 'A' 'B' and 'X'*	*Performance Group 'C' See Note 1*	*Performance Groups 'E' and 'F' See Note 4*
Rwy lighting and marking available	CC/RVR (feet/metres)	CC/RVR (feet/metres)	CC/RVR (feet/metres)
High intensity centre line lighting	0/150 See Note (7)	200/500 See Note (2)	300/500 See Note (3)

High intensity edge
lighting and rwy centre
line marking
0/200
200/500
See Note (2)
300/500
See Note (3)
High intensity edge
lighting (day/night)
Low intensity edge
lighting (night only)
and no centre line
marking
0/300
200/500
300/600
Rwy centre line
marking with or
without low intensity
edge lighting (day)
0/350
200/600
300/800
No lighting or marking
(day), low intensity
edge lighting and no
rwy centre line marking
(day)
0/500
200/1000
300/1000

NOTES (1) Aeroplanes which have data in the Flight Manual that allows the engine-inoperative net flight path to be constructed from 100 ft or which have flaps up take-off data scheduled in the Flight Manual, may reduce the cloud ceiling (cc) minimum to 100 ft, with the approval of the Assigned Inspector.

(2) In circumstances when the emergency distance available is greater than twice the take-off distance required as specified in accordance with AN(HK)O Schedule 15, the minima may be reduced to 300 metres RVR and, when reported, 100 ft cloud ceiling.

(3) In circumstances when the emergency distance available is greater than twice the take-off distance required as specified in accordance with AN(HK)O Schedule 15, the minima may be reduced to 400 metres RVR and, when reported, 200 ft cloud ceiling.

(4) These minima are only valid for multi-engined aeroplanes which can achieve a one-engine-inoperative en route climb of at least 150 feet per minute (fpm); otherwise the take-off limit applicable to single-engined public transport operations of 1000 ft cloud ceiling and 1800 m visibility will apply.

(5) Commanders of aeroplanes in Groups C, E, F and X with less than 50 hours on

type must increase any quoted minima by 100 ft and 200 metres.
(6) Minima for aeroplanes having no performance group classification shall be agreed on an individual basis with the Authority.
(7) Reductions below a take-off minima of 150 metres RVR may be authorised for some aircraft.

2.4
Experience has indicated that it is unlikely that sufficient runway will be available for a successful landing straight ahead unless the Emergency Distance Available (EDA) is at least twice the Take-Off Distance Required (TODR) from the start of the take-off roll.

2.5
When the RVR is not reported, aeroplane commanders should assess the apparent RVR by noting the number of runway lights visible from the aircraft providing the relevant light spacing is known. This procedure is only to be used for the purposes of RVR assessment for take-off and in conditions when the assessment is greater than 150 metres.

3
AIRCRAFT CATEGORIES AND OBSTACLE CLEARANCE HEIGHTS/ALTITUDE

3.1
The OCH/A is calculated, in part, relative to an Aircraft Category which is defined as follows:

AIRCRAFT CATEGORIES

Aircraft Category	*Nominal Speed at Threshold V_{AT} or V_{REF} (kts)*
A	Less than 91
B	91 - 120
C	121 - 140
D	141 - 165
E	166 - 210

3.2
The nominal V_{AT}, which is calculated by multiplying the indicated stalling speed in the approach configuration at maximum certificated landing weight by 1.3, is taken to be a fixed value for categorisation purposes. Therefore there is no need to consider changing the category should it be necessary to change the actual V_{AT} for a particular approach. For this purpose all helicopters fall into Category A.

4
DECISION HEIGHT, PRECISION APPROACHES

4.1

Minimum decision heights for approaches using Precision Approach Radar (PAR), Microwave Landing System (MLS) or Instrument Landing System (ILS) with in-line localiser and a glide slope between 2.5° and 3.5° should be determined by selecting the published OCH for the category of aircraft and comparing it with the system minimum given at paragraph 9 to this Chapter. The higher of these two values should then be taken and the position error correction applied before entering the value in the manual.

4.2

Before specifying decision heights based on the use of radio/radar altimeters, operators should consult their assigned Operations Inspector.

4.3

Precision approach OCH includes an aircraft height loss allowance to cover the initiation of a missed approach.

4.4

Operators should note and action as necessary that a special (increased) Category D OCH will be given for certain Instrument Approach Procedures (IAPs) for aeroplanes with greater than the standard dimensions used for the calculation of OCH. The standard dimensions are a semi-span of 31 metres and a vertical distance of 6 metres between the flight paths of the lowest part of the wheels and the glide path antenna, when the aircraft is in the final approach attitude.

4.5

With offset localisers, the specified OCH/A should not be less than the height/altitude on the nominal glide path at which the localiser intersects the runway extended centreline, plus 20m (66 ft). See ICAO Procedures for Air Navigation Services - Aircraft Operations, Volume 11 (PANS-OPS), Chapter 23.

5

MINIMUM DESCENT HEIGHT (MDH), NON-PRECISION APPROACHES

5.1

For approaches using an aid other than full ILS, MLS, or PAR, the MDH should not be less than the published OCH for the Category of the aircraft or the system minimum, whichever is the higher. In this case there is normally no need to apply a Position Error Correction (PEC) since this OCH includes an altimeter correction allowance of 50 ft. When however, the PEC is greater than 50 ft, the difference between this value and the Flight Manual figure will need to be added to the published OCH.

5.2

It must be noted that the aircraft is assumed to be in level flight when it arrives at the Missed Approach Point (MAP) for the calculation of obstacle clearance in the missed approach area. The implications of not being in level flight on the initiation of a missed approach are clear.

5.3

The ILS glide-path-inoperative procedure is non-precision but occasionally it will be found that the decision height for full ILS derived in accordance with paragraph 4.1 will be higher than the MDH for the glide path inoperative procedure. In such a situation, the lower MDH for the non-precision procedure must not be used as the decision height for the full ILS procedure.

6

VISUAL MANOEUVRING

6.1

The visual circuit height or the visual manoeuvring (circling) OCH specified for visual manoeuvring after an instrument approach and associated visibility, should never be less than the values tabulated below:

A/C Category	*Min Circling Height*	*In-Flt Circling Min. Vis (km)*
A	400 ft	1.9
B	500 ft	2.8
C	600 ft	3.7
D	700 ft	4.6

NOTE: These values are only valid within the visual manoeuvring area calculated in accordance with ICAO Procedures for Air Navigation Services - Aircraft Operations (PANS OPS).

6.2
The value of the RVR for a visual approach should be 800 metres or the lowest non-precision IAP RVR for the runway of intended landing when this is listed, whichever is the greater, regardless of approach lighting, time of day, or type of aircraft.

7
DETERMINATION OF MINIMUM RUNWAY VISUAL RANGE (RVR)
The minimum RVR to be associated with decision/minimum descent height can be determined from Table 1 or 2.

TABLE 1
PRECISION APPROACH TABLES
Minimum RVR for all aeroplane categories

	Approach lighting length (metres) and type (key below)			
DH (feet)	LA	LB	LC	LD
200-250	600 (note 1)	700	800	900
251-300	650	800	900	

1000
301-350
700
900
1000
1100
351-400
750
1000
1100
1200
401-450
800
1100
1200
1300
451-500
900
1200
1300
1400
501-550
1000
1300
1400
1500
551-600
1100
1400
1500
1500
601-650
1200
1500
1500
1500
651-700
1300
1500
1500
1500
Over 700
1500
1500
1500
1500
NOTES:
(1)
If runway centre line, touchdown zone and threshold lighting is in use, an RVR of 550m is permitted when the DH is 200 ft.
(2)
Table 1 is only applicable to conventional approaches in the order of a 3° glide slope. Greater glide slope angles will usually require that visual glide slope guidance (e.g. PAPI) is also visible at DH.
LA: 720m or more High Intensity (HI)
At least 4 X-bars with coded CL or 1 X-bar with centreline barrettes

LB: 400m to 719m HI
At least 1 X-bar with coded CL or centreline barrettes
LC: Up to 399m HI
At least 1 X-bar or centreline barrettes
LD: No approach lighting or for any system not meeting the above specifications

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TABLE 2
NON-PRECISION APPROACH TABLES
Minimum RVR for all aeroplane categories
Approach lighting length (metres)
and type (key below)
MDH (feet)
LA
LB
LC
LD
250
650
800
900
1000
251-300
700
900
1000
1100
301-350
800
1000
1100
1200
351-400
900
1100
1200
1300
401-450
1000
1200
1300
1400
451-500
1100
1300
1400
1500
501-550
1200
1400
1500

1500
551-600
1300
1500
1500
1500
601-650
1400
1500
1500
1500
651-700
1500
1500
1500
1500
Over 700
1500
1500
1500
1500
LA: 720m or more High Intensity (HI)
At least 4 X-bars with coded CL or 1 X-bar with centreline barrettes
LB: 400m to 719m HI
At least 1 X-bar with coded CL or centreline barrettes
LC: Up to 399m HI
At least 1 X-bar or centreline barrettes
LD: No approach lighting or for any system not meeting the above specifications

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8
CONVERSION OF REPORTED METEROLOGICAL VISIBILITY TO RVR

Table 3 provides factors that should be applied when converting meteorological visibility to equivalent RVR.

Lighting Elements Available	*RVR = Reported Met Visibility x*	
	Day	*Night*
High Intensity Approach and Runway Lighting	1.5	2.0
Any type of lighting installation other than above	1.0	1.5
No lighting	1.0	-

NOTE: Factoring of meteorological visibility for calculating Category II or III minima, or when a reported RVR is available, is not permitted.

9
LOWEST ACCEPTABLE AERODROME OPERATING MINIMA
Specified minima should not be less than the highest of:
(a)
Minima determined in accordance with the method described in this document.
(b)
Minima notified or accepted by the regulating authority of the State in which the aerodrome is located (State minima).
(c)
The Decision/Minimum Descent Heights listed below.
9.1
Precision Approach Aids
DH (ft)
ILS
200
PAR
200
MLS
200
NOTES: Lower minima may be authorised by the Authority.
9.2
Non-Precision Approach Aids
MDH (ft)
ILS (no glide path)
250
SRA (terminating at 2 nm)
250
SRA (terminating at 1 nm)
300
SRA (terminating at 2 nm)
350
VOR
300
NDB
300
VDF (QDM or QGH)
300
NDB/DME
300
VOR/DME
300
GPS PRIMARY
250

CHAPTER 4 APPENDIX C - RESCUE AND FIRE FIGHTING SERVICES (RFFS) LEVELS
Note: The contents of this Appendix are reproduced from ICAO Annex 6 Part I Attachment K.
ATTACHMENT K. RESCUE AND FIRE FIGHTING SERVICES (RFFS) LEVELS
1. Purpose and scope

1.1 Introduction
The purpose of this Attachment is to provide guidance for assessing the level of RFFS deemed acceptable by aeroplane operators using aerodromes for different purposes.
1.2 Basic concepts
1.2.1 While all aeroplane operators should aim to have the level of RFFS protection required by Annex 14, Volume I, Chapter 9, 9.2, some of the aerodromes currently used do not meet these requirements. Furthermore, Annex 14, Volume I provisions relate to the level of aerodrome RFFS to be provided for aeroplanes normally using an aerodrome.
1.2.2 If an aerodrome is exposed to a temporary reduction of its RFFS capability, Annex 14, Volume I, 2.11.3, requires that: *"Changes in the level of protection normally available at an aerodrome for rescue and fire fighting shall be notified to the appropriate air traffic services units and aeronautical information services units to enable those units to provide the necessary information to arriving and departing aircraft. When such a change has been corrected, the above units shall be advised accordingly."*
1.2.3 The following guidance is intended to assist operators in making the assessment required by Chapter 4, 4.1.4. It is not intended that this guidance limit or regulate the operation of an aerodrome.
2. Glossary of terms
Aerodrome RFFS category. The RFFS category for a given aerodrome, as published in the appropriate Aeronautical Information Publication (AIP).
Aeroplane RFFS category. The category derived from Annex 14, Volume I, Table 9-1 for a given aeroplane type.
RFFS category. Rescue and fire fighting services category as defined in Annex 14, Volume I, Chapter 9.
Temporary downgrade. RFFS category as notified, including by NOTAM, and resulting from the downgrade of the level of RFFS protection available at an aerodrome, for a period of time not exceeding 72 hours.
3. Minimum acceptable aerodrome RFFS category
3.1 Planning
3.1.1 In principle, the published RFFS category for each of the aerodromes used for a given flight should be equal to or better than the aeroplane RFFS category. However, if the aeroplane RFFS category is not available at one or more of the aerodromes required to be specified in the operational flight plan, an operator should ensure that the aerodrome has the minimum level of RFFS which is deemed acceptable for the intended use in accordance with the instructions contained in the operations manual. When establishing acceptable levels of minimum RFFS for these situations, the operator may use the criteria in Table K-1.

3.1.1.1 Intended operations to aerodromes with RFFS categories below the levels specified in Annex 14, Volume I, Chapter 9, 9.2, should be coordinated between the aeroplane operator and the aerodrome operator.
Table K-1. Minimum acceptable aerodrome category for rescue and fire fighting
Aerodromes
(Required to be specified in
the operational flight plan) (1)
Minimum acceptable aerodrome RFFS category
(Based on published aerodrome RFFS category)
Departure and destination
aerodrome
RFFS category for each aerodrome should be equal to or better than
the aeroplane RFFS category.
One category (2) below the aeroplane RFFS category may be
accepted where provided as a remission in accordance with Annex
14, Volume I, 9.2, but not lower than Category 4 for aeroplanes with
maximum certificated take-off mass of over 27 000 kg and not lower
than Category 1 for other aeroplanes.
Departure and destination
aerodrome in case of
temporary downgrade and
Take-off alternate, destination
alternate and en-route

alternate aerodromes
Two categories below the aeroplane RFFS category, but not lower than Category 4 for aeroplanes with maximum certificated take-off mass of over 27 000 kg and not lower than Category 1 for other aeroplanes.
ETOPS en-route alternate aerodrome
RFFS Category 4 for aeroplanes with maximum certificated take-off mass of over 27 000 kg or not lower than Category 1 for all other aeroplanes, under the condition that at least 30 minutes' notice will be given to the aerodrome operator prior to the arrival of the aeroplane.

Notes.—

(1) If an individual aerodrome serves more than one purpose, the highest required category corresponding to that purpose at the time of expected use applies.

(2) Annex 14, Volume I, determines the aerodrome category for rescue and fire fighting according to 9.2.5 and 9.2.6 except that, where the number of movements of the aeroplanes in the highest category normally using the aerodrome is less than 700 in the busiest consecutive three months, the category provided may be one lower than the determined category.

3.1.2 For all-cargo operations, further reductions might be acceptable provided that the RFFS capability is adequate to arrest fire around the flight deck area long enough for the persons on board to safely evacuate the aeroplane.

3.2 In flight

3.2.1 In flight, the pilot-in-command may decide to land at an aerodrome regardless of the RFFS category if, in the pilot's judgement after due consideration of all prevailing circumstances, to do so would be safer than to **divert**.

CHAPTER 4 APPENDIX D - ONE-ENGINE-INOPERATIVE FERRY FLIGHTS - 3 OR 4 ENGINED AEROPLANES

1 GENERAL

1.1

A one-engine-inoperative ferry flight should never be seen as a 'normal operation' since the margins for control and performance, especially in the approach and climb phase, can be significantly different from those associated with normal operations, and in particular, landing distance requirements. The use of such a procedure should be considered only when no reasonable alternative course of action is available and should apply only to three or four engined aircraft. Operators, therefore, must always consider and favour bringing the spares and rectification team to the aircraft to render it serviceable rather than conducting an engine inoperative ferry flight.

1.2

Companies who consider that they may need to resort to one-engine-inoperative ferry flights should set up procedures in advance of such an operation, in order to ensure that it is planned and handled in a considered manner.

One-engine-inoperative ferry flights should not be considered unless the limitations, performance and operational procedures are specified in the approved Aircraft Flight Manual (AFM).

1.3

No Public Transport or Aerial Work operations are permitted for one-engine-inoperative ferry flights.

2 PROCEDURES

The following are items which should be considered, and included as instructions in the operations manuals (OM) and Engineering Instructions prepared by the operator.

(a)
Procedures to ensure that all AFM and Maintenance Manual (MM) requirements are strictly adhered to.
(b)
A requirement for a formal statement by a responsible engineer that the aeroplane has been prepared for an engine-inoperative ferry flight with specified minimum equipment. In making such a statement, consideration should be given to the other sources available for hydraulics, electrics, air conditioning and other essential services. For example, in the case of the BAe 146, the Auxiliary Power Unit (APU) must be serviceable to provide added hydraulic/electrical power in the event of the subsequent failure of a paired engine.
(c)
The nomination of commanders and co-pilots authorised to carry out such flights; special authorisations needed from management before each flight; persons on board to be limited to nominated essential crew only.

(d)
A programme specified in the Training Manual (TM) which identifies the minimum necessary training that is required before a commander or co-pilot is considered authorised. As a minimum this should include satisfactory completion of an engine-inoperative take-off and two engine out go-around procedures in a simulator approved for such training, together with pre-flight planning of such an operation. Ideally the exercise should have been practised on two separate occasions before a crew is cleared to operate one-engine-inoperative ferry flights. The required experience should, depending on the complexity of techniques involved, include one engine-inoperative techniques training, or practice in an approved flight simulator, within a period not exceeding 13 months prior to the flight. The crew should be certificated as competent by the operator.
(e)
The requirements for actual and forecast weather conditions to be at least a minimum cloud base of 1000 ft agl and 2 km visibility, or as specified in the AFM for one-engine-inoperative take-off and landing procedures, whichever is the greater. A conservative maximum crosswind limit should also be applied; it is recommended to be not more than 7 kts if from the same side as the inoperative-engine, unless otherwise quoted in the AFM. One-engine inoperative ferry take-offs are permitted from a dry or wet runway unless otherwise stated in the AFM, but are not permitted from a slippery runway or from a runway contaminated by standing water, snow or slush.
(f)
Consideration should be given to fuel planning requirements for flight with one-engine-inoperative, giving particular attention to consumption rates.
(g)
Flight crews should be thoroughly familiar with the handling techniques to be used during take-off and the procedures to be followed in the event of a further engine or other system failure. These aspects should be fully covered during the take-off briefing. The AFM provides full details applicable to each aeroplane type, and the handling technique may vary depending upon whether the inoperative engine is inboard or outboard (4-engined types), or is centreline

or non-centreline mounted (3-engined types). The procedure may specify setting rudder trim away from the inoperative engine. Generally, it will not be possible to set take-off power on an asymmetric serviceable engine from the start of the take-off run; the asymmetric thrust will need to be progressively increased as the aeroplane accelerates. It is likely that the AFM procedure will call for use of nose wheel steering, in addition to rudder, to maintain directional control initially. While the thrust setting technique is intended to ensure that the thrust asymmetry always remains within the directional control capability of the aeroplane, it is also important that the asymmetric thrust setting is not delayed so as to erode the margin allowed in the scheduling of the take-off distance.

(h)

It is important that flight crews appreciate the handling and performance requirements on which the limitations for one-engine-inoperative ferry take-offs are based, as these are significantly different from normal operations. The major consideration is that the scheduled take-off distance and the handling characteristics on which the associated operating speeds are based, take no account of the possible failure of a further engine prior to the aeroplane becoming airborne. It is accepted, therefore, with such operations that a period of risk may exist during which, in the event of a further engine failure, the aeroplane can neither stop in the remaining distance available nor continue the take-off. The AFM may provide advisory data on accelerate stop distances from various stop speeds. However, such stop speeds cannot be considered as equivalent to a normal V_1 as a continued take-off capability in the event of a further engine failure above this speed is not guaranteed and the scheduled take-off distance need not take account of the accelerate stop distance. This risk period can only be eliminated totally if, at the planned take-off weight, the runway is of sufficient length that there is adequate runway remaining to permit a stop at a speed of not less than V_R. However the situation will still be influenced, one way or another, by the particular characteristics of the aeroplane type concerned and whether the second engine failure adds to or reduces the thrust asymmetry. Once the aeroplane is airborne, continued flight will be possible following the failure of a further engine, but the directional control margins and climb gradient capability will be considerably less.

(i)

Operators should assess their OMs to ensure that all the points discussed in subparagraphs (g) and (h) above, and as elaborated in the particular AFM, are covered and are strictly adhered to before flight crews undertake any one-engine-inoperative ferry flights.

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CHAPTER 4
APPENDIX E
ONE-ENGINE-INOPERATIVE FERRY FLIGHTS - HELICOPTERS
Cancelled – refers to CAD 360 Helicopter Supplement

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CHAPTER 4 APPENDIX F - STORAGE OF DANGEROUS GOODS

1
GENERAL

1.1
The worldwide requirements for the carriage by air of Dangerous Goods (DG) are comprehensively addressed in the International Civil Aviation Organisation's 'Technical Instructions for the Safe Transportation of Dangerous Goods by Air' (ICAO TIs). By comparison, requirements for pre or post-flight storage of DG at airports are mostly the responsibility of each state's Fire Services authority; in consequence, there is no worldwide standardisation of storage requirements with the result that standards enforced by individual Fire Services vary widely.

1.2
As there have been a number of accidents or major incidents worldwide in recent years involving DG, either when in storage at airports or during carriage by air, it is important that the relevant storage and carriage requirements are clearly understood by operators and their cargo agents. Insofar as storage requirements are concerned, Hong Kong AOC holders and their agents are expected to comply with the standards set by the Hong Kong Fire Services Department (FSD) in Hong Kong or competent authorities outside Hong Kong for outstations.

1.3
The FSD's DG storage requirements can be summarised as follows for reference. However, operators should consult FSD about the latest requirements:

(a)
DG should be stored in a delineated, well ventilated area, separated from non-DG cargo.

(b)
The storage area should display clearly visible signs indicating 'DANGEROUS GOODS' or 'CAT 2/3/4/5* DG' or 'ICAO CLASS 1-9* DG' and 'NO SMOKING'.
* appropriate class or category
(c)
The DG acceptance area should display a notice giving information about the transport of DG, as per ICAO TI.
(d)
Suitable fire extinguishing equipment should be provided immediately adjacent to the DG storage area.
(e)
DG items should be segregated from non-DG cargo, and certain classes / divisions of DG must be segregated from each other as required by the ICAO TI.
(f)
DG items should be stored and handled in accordance with the orientation label displayed on the item.
(g)
Radioactive items should be stored in accordance with local state requirements, preferably in a separate and secure Radioactive store.
(h)
Cargo agent's staff should be provided with written responsibilities in respect of DG, in particular the need for careful handling at all times, and for a sound knowledge of the relevant emergency procedures.

1.4
At those airports where DG is 'accepted' for transportation, operators should ensure that adequate numbers of their own or their agent's staff hold IATA DG Licences to provide the requisite standards of handling and supervision.
1.5
Where little DG is handled at a particular outstation, dedicated DG storage facilities need not be provided. However, in this situation, specific one-off arrangements must be made between the operator, the cargo agent and the shipper to ensure that the required procedures are followed.

CHAPTER 4 APPENDIX G – MIXED FLEET FLYING (MFF)

1. General

1.1
MFF will only be considered for those aircraft types which are conducive to Cross Crew Qualification (CCQ) training, as recommended by the aircraft manufacturer.

1.2
CCQ is the process of training and testing whereby the similarities of two or more aircraft are such that substantial credit for training and testing on Type A can be credited to Type B, within the same 'Family' of aircraft.
1.2.1 The minimum experience level to commence CCQ Training Type A to Type B is as follows:
(a)
Minimum four months after Aircraft Line Check on Type A, and;
(b)
Minimum 200 hours on Type A, and;
(c)
Minimum 20 sectors on Type A.
1.2.2 On completion of CCQ from Type A to Type B, the first take-off and landing in Type B must be completed within 21 days of completion of the box items required by the appropriate **Blue DCA528 Form**.
1.2.3 The minimum experience level on Type B prior to clearance to MFF is as follows:
(a)
Minimum 50 hours on Type B or;
(b)
10 Sectors on Type B.
1.3
In order to qualify for MFF, on completion of the consolidation period on Type B, the candidate must hold a valid Proficiency Check (PC) and Aircraft Line Check on Type A at the time he/she completes the Aircraft Line Check on Type B.
1.4
Rostering MFF Crews
MFF crews may be rostered for the MFF qualified types within the same FDP.
1.5
Scheduled 9 and Schedule 11 Requirements − MFF Crews
1.5.1 **Schedule 9**
(a)
On completion of the CCQ course and within 6 months of the last PC renewal on Type A, an initial PC test on Type B must be completed.

(b)
Subsequent PCs must alternate, and must be conducted such that there is never more than 13 months between same Type PCs, nor less than 4 months between alternate Type PCs.
(c)
Should two different Type PCs be conducted within 4 months of each other, the first of these two must be renewed no later than 6 months after the date of the second PC renewal.
(d)
Should either Type PC expire, then both Type PCs are deemed to have expired, and **BOTH** must be renewed before MFF qualification is restored. Once the first PC has been renewed, the pilot may then operate that Type only until the PC for the other Type has been renewed. After both PCs have been renewed, subsequent renewals must be in accordance with sub para's (b) and (c) above.
1.5.2 **Schedule 11 – Line Check (LC)**
Requires an Exemption from AN(HK)O 1995

(a)
Having completed a LC on Type B during the CCQ process, a renewal of the Type A Line Check must be completed no later than 13 months after the LC on Type B.
(b)
Subsequent Line Checks must alternate, and must be conducted such that there is never more than 13 months between different Type LCs, and never more than 25 months between same Type LCs.
(c)
Should either Type LC expire, then both Type LCs are deemed to have expired, and **BOTH** must be renewed before MFF qualification is restored. Once the first LC has been renewed, the pilot may then operate that Type only until the LC for the other Type has been renewed. After both have been renewed, subsequent renewals must be in accordance with sub para (b) above.

1.5.3 **Emergency Manoeuvres and Procedures**

Requires an Exemption from AN(HK)O 1995

(a)
Validity is in accordance with the PC stated in para 1.5.1 above.
(b)
Emergency Manoeuvres and Procedures on Type A are valid on Type B and vice versa.

1.6
MFF Licence Procedures

On completion of the CCQ course for aircraft Type B the completed CCQ Blue DCA528 Form, together with the pilot's licence, should be submitted to the **CAD** Personnel Licensing Office (PLO) for the issue of a standard C of T. The C of T pages will be endorsed for both Types A and B and signed by a PLO Officer. The pilot's licence, together with the new C of T page will be returned to the said pilot. It is to be noted that the MFF C of T is not valid until the said pilot has 50 hours or ten sectors on type B (see para 1.2.3 above).

1.7
MFF Recency Requirements

1.7.1 **35 Day Recency**

A pilot may not fly as a MFF Commander unless he has carried out at least one Take-off and one Landing in either aircraft Type A or B during the previous 35 day period. Revalidation may be carried out in either the simulator or aircraft.

1.7.2 **3 Months Recency**

Requires an Exemption from AN(HK)O 1995

A Commander or Co-pilot, to maintain the three months MFF recency, must complete a minimum of two take offs and two landings in either aircraft Type A or Type B. A minimum of one take off and one landing must then be completed in the other Type. Recency may be re-validated in a simulator approved for the purpose (see General Exemption − Recency Re-validation).

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CHAPTER 5 - TRAINING AND TESTING

1 GENERAL REQUIREMENTS FOR AIRCRAFT FLIGHT CREW TRAINING AND TESTING

1.1
All training courses require **CAD** approval.

1.2
The statutory requirements relating to the training and periodical testing of aircraft flight crews are specified in the Air Navigation (Hong Kong) Order [AN(HK)O]. The primary purpose of this chapter is to indicate the nature of the arrangements considered necessary to secure an adequate standard of compliance and to specify those tests which form part of that compliance.

1.3
Under normal circumstances, a person administering any periodic check specified in Schedule 11 to the AN(HK)O should be currently qualified to at least the standard that the person being examined is required to demonstrate during that check.

1.4
The training and periodic tests of all crew members are required to be conducted in accordance with syllabi agreed with the Department and published in the operator's training manual. Proposed changes to syllabi or departures from training programmes must be agreed by the Department before implementation.

1.5
Operators, who wish to outsource initial, recurrent and conversion training, must ensure that **CAD** approves the training courses. Approved training organisations or the equivalent that have State regulatory approval, may be accepted by **CAD** to conduct training for Hong Kong operators, however, courses still require **CAD** approval. The qualification, training and approval of training and examining personnel utilised by an organisation, will normally be required to be in accordance with paragraphs 4.1 - 4.8 of this Chapter. Additional requirements for the personnel utilized by organisations approved by other States are detailed in paragraph 4.9 of this Chapter. The training provided and flight documentation used should reflect the operators' flight safety documents system.

1.6
Operators, who outsource training to training organisations that do not have formal State approval, will need to consult **CAD** on an individual basis to establish the approval requirements for their courses, the adequacy of training facilities, qualification requirements and approval of personnel.

2 TRAINING MANUAL

2.1
It is a statutory requirement that a training manual shall contain all such information and instructions as may be necessary to enable persons appointed by the operator to give or supervise the training, practice and periodical tests to perform their duties.

2.2
Care must be taken not to interpret 2.1 as meaning that a training manual should

contain technical and operating information for general instructional purposes. Rather, it should remain concise in its purpose of giving formal expression to the operator's training policy and requirements, together with adequate guidance on these matters to instructors and examiners.

2.3

The training manual is regarded by the Department as the primary indication of the standards of training and testing likely to be achieved by the operator. One copy must be submitted to the Department, together with any later amendments or additions.

2.4

Each copy of a manual must bear a serial number and a distribution list must be held by a person responsible for issuing amendments. Each volume of the manual must be numbered, bear a title and a list of contents giving a clear indication of its scope. The title of the person or department responsible for the issue of the manual must also be included. At the front of each volume there must be an amendment page to record amendment number, date of incorporation, signature of person amending and page(s) or paragraph(s) affected. The numbering of pages, sections, paragraphs etc should be orderly and systematic so as to facilitate immediate identification of any part of the subject matter. The standard of printing, duplication, binding, section dividers, indexing of sections etc should be of sufficient quality to enable the document to be read without difficulty and to ensure that it remains intact and legible during normal use.

2.5

The amendment of a manual in manuscript is not acceptable. Changes or additions, however slight, must be incorporated by the issue of a fresh or additional page which must be dated and on which the new or additional material is clearly marked. It is therefore recommended that items likely to be the subject of frequent change, such as lists of appointments, are shown on pages that do not include more permanent text.

2.6

Although the training manual is part of the general operations manual, it should be a separate document addressed to the training staff, each of whom should have a personal copy. The form that the manual takes will vary considerably according to the size and complexity of the operator's organisation and the aircraft used; its adequacy will be assessed solely on the basis of its suitability for the operator's particular needs and circumstances. It is therefore important that all training staff are aware of the need to keep the document under review and ensure that it accurately reflects the operator's circumstances at the time.

2.7

In addition to the more general matters of policy, the following in particular must be included in the manual:

(a)

operator's requirements in respect of qualifications, training and experience of training staff;

(b)

the name and title of the person ultimately responsible for flight crew training and testing and lines of reporting to and from that person's post;

(c)

a comprehensive statement of the duties and responsibilities of all training staff, which should include their names, the type of training and/or testing which they may conduct and the types of aircraft on which they are authorised;

(d)
minimum standards of experience and qualification, and of initial and periodical training to be met by all aircraft flight crews for each type of aircraft used by the operator;
(e)
detailed syllabi for both ground and flying training and specimen record forms in respect of all training and tests; the minimum hours/sectors necessary to meet flight training requirements;
(f)
a list of the required competency tests and their frequency;
(g)
arrangements for administering and recording the periodical tests of all flight crew;

(h)
limitations on flying more than one type or variant;
(i)
policy with regard to crewing together of crew members under training;
(j)
training of pilots to act as relief crew occupying other than their normal crew positions;
(k)
syllabus covering training requirements for promotion of co-pilot to Captain;
(l)
checking of pilots in handling and non-handling pilot duties;
(m) chain of command in an emergency, when training captain not occupying a pilot's seat;
(n)
methods of simulating instrument flight conditions; methods of simulating engine failure and the form of words to be used;
(o)
practice of abandoned take-off during training flights, normally a restriction to speeds not in excess of 50% of V_1;
(p)
procedures for touch-and-go or stop-go landings with particular emphasis on division of duties, considerations of flap settings, runway length, brake cooling and terrain;
(q)
syllabus covering engineering perspectives including MEL/CDL, technical log, airworthiness defects;
(r)
proper flight crew coordination and training in all types of emergency and abnormal situations or procedures caused by power plant, airframe or systems malfunctions, fire or other abnormalities.
(s)
instructions and guidance on how Predictive and Low Level Windshear initial and recurrent training should be conducted, with emphasis on the positive action required to minimise the effect of these conditions if encountered during take-off, on the approach and landing. Advice must also be given on the avoidance of these conditions;

(t)
limitations on training and testing in the course of flights for the purpose of public transport. Note particularly that the simulation of instrument flight conditions and of emergencies affecting the flight characteristics of the aircraft is prohibited in the course of flights for the public transport of passengers;
(u)
instructions covering retesting and retraining after unsatisfactory performance or periods of non flying due to illness or other causes;
(v)
the use of full flight simulators, other training devices and copies of Approval documents held;
(w)
special equipment training: FMS, INS, E/GPWS, ACAS, HUD/EVS, etc.;
(x)
Human Factors (HF) and Crew Resource Management (CRM) training;

(y) Safety Management System training;
(z) instructions and procedures covering pilot incapacitation and the roles of all crew members;
(aa) aviation security training;
(bb) guidance on the carriage of dangerous goods in accordance with the current edition of the ICAO Technical Instructions for the Safe Transport of Dangerous Goods by Air Doc 9284; and
(cc) prevention of runway incursion in accordance with the current edition of the ICAO Manual on the Prevention of Runway Incursions (Doc 9870).

3
TRAINING AND TESTING STAFF

3.1
A person, whose qualifications and experience are agreed by the Department to be suitable, must be designated to take general and overall charge of arrangements for the training and testing of aircraft flight crews. This person's name, authority, responsibilities and reporting routes must be clearly defined in the operations manual.
3.2
Under the control of the person in charge of training, the operator will need to appoint examiners and instructors to conduct periodical tests and give the practical training, as necessary, to satisfy the requirements of the AN(HK)O. The number of training staff employed is expected to be consistent with the operator's task and their qualifications and experience are expected to reflect the role and types of aircraft used.
3.3
It is important that examiners and instructors are experienced and qualified for their task, and operators are to ensure that they are adequately trained in teaching and examining techniques. Where it is intended that they will carry out tests required under Schedules 9 and/or 11 of the AN(HK)O in an approved flight simulator, they themselves must be duly approved by the Department for that purpose.
3.4
Exceptionally, operators may need to use the services of manufacturers' pilots or those from foreign operators for flight training, testing and route Line Flying Under Supervision (LFUS). Such training staff must be familiar with the operations manual and the training manual of the operator to whom they are temporarily attached. The operator must obtain certified copies of duty and rest period records for the 28 days

prior to the crew members being rostered for duty; appropriate flight/duty records must be maintained for the period that the crews are assigned to the operator. As a general rule, a Hong Kong licence or a temporary validation of a foreign licence will have to be obtained. The operator should contact the **CAD** Personnel Licensing Office to obtain the necessary Certificate of Validation for the foreign pilots. The Department will specify requirements in individual cases. When such pilots are used for training they must be properly licensed and authorised to conduct initial type ratings, instrument rating renewals and competency checks. To conduct LFUS, pilots are required to hold full company command qualification for public transport flights and to meet all Schedule 11 competency check requirements.

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4 TRAINING AND EXAMINING STAFF QUALIFICATIONS

4.1 Schedule 9 (Flight Crew Licences)

4.1.1 Flight tests for the initial issue or renewal of Aircraft Ratings and renewal of Instrument Ratings may only be conducted by examiners so authorised by the Director-General of Civil Aviation. Applicants for appointment as Authorised Examiners (AE) must be sponsored by their employer. Any authority becomes automatically invalid the moment the examiner leaves the sponsor's employment.

4.1.2 The applicant for appointment as an AE for aeroplanes shall hold an appropriate licence and ratings and a valid medical certificate. As a general guideline, the applicant is expected to have a minimum of 2,000 hours flight time as a pilot of multi-engined aeroplanes and has achieved high standards in flying ability as evidenced by at least two Proficiency Checks being separated by an interval of not less than 4 months with his current employer sponsoring his AE application. An applicant for AE for helicopters is expected to have at least 500 hours as the pilot-in-command and at least 250 hours as a flight instructor/training captain.

4.1.3 Prior to granting authorised status as an Instrument Rating Examiner (IRE) and/or a Type Rating Examiner (TRE), the Department must be satisfied that the applicant is a fit person to hold the authorisation and qualified to do so by reason of his knowledge, experience, competence and skill.

4.1.4 In assessing the above criteria the applicant's previous conduct will be taken into consideration. The applicant must meet certain experience levels, have completed the **CAD** Authorised Examiner's Course (**CAD** AE course) and have satisfactorily conducted a test whilst observed by an Operations Inspector.

4.1.5 The **CAD** AE course is undertaken using facilities provided by approved Hong Kong operators. It consists of briefings, facilitation and de-briefings utilising English as conversational as well as aviation technical language. Therefore applicants, in addition to meeting the high standards referred to in the above paragraphs, should also have attained the requisite language skills in order to ensure a successful course outcome.

4.1.6 The AEs who have previously successfully completed the **CAD** AE course and who have not exercised the privileges of their authority within the preceding five years will be required to attend the first two-day **CAD** briefings of the **CAD** AE course prior to being considered for reappointment.

4.1.7 A TRE (simulator) must be qualified on type under the provisions of the AN(HK)O. His ability to perform the functions while occupying the co-pilot's seat must be checked and recorded by the operator.

4.1.8 An examiner's authority will be valid for three years in the case of Hong Kong based examiners and shorter than three years for non-Hong Kong based examiners at approved training establishments. The tests that an AE is authorised to conduct are stipulated on the Letter of Authority (LoA) granted by **CAD**. The AE must ensure that he exercises the privileges in accordance with the LoA at all times.

4.1.9 A **CAD** Flight Operations Inspector (FOI) or a person properly delegated by the Director-General of Civil Aviation will renew an examiner's authority at the appropriate period. In the event that a satisfactory standard is not achieved, then the examiner's authority will be revoked by the **CAD**. Further assessment for re-appointment may be made after further training, agreed between his company and HK **CAD**, has been undertaken.

4.1.10 All applications for appointment as an AE must include the following particulars:

(a) full name;

(b) licence type, number and expiry date;

(c) aircraft types endorsed in Part 1 of the licence;

(d) date of last Certificate of Test (Aircraft Rating) for aircraft type to which the application relates, and whether annotated P1, P2 or E1;

(e) date of last Certificate of Test (Instrument Rating) and type of aircraft on which tested;

(f) date of last medical;

(g) total hours P1 or E1 - all types;

(h) total hours P1 or E1 - in previous 12 months on type to which the application relates;

(i) total hours PI or E1 - all turbo-jet aircraft, if application relates to a turbo-jet aircraft;

(j) total hours P1 or E1 - all turbo-prop aircraft, if application relates to turbo-prop aircraft;

(k) details and result of any courses in instructional or examining techniques undertaken;

(l) details, with supporting documentation, of any examining authority held, or previously held, from any other regulatory authority;

(m) any other relevant information.

4.2 **Schedule 11 (Public Transport)**

4.2.1 An operator is responsible for ensuring that all persons have the training, experience and practice and have undergone the periodical tests specified in Part B of Schedule 11 to the AN(HK)O, before acting as crew members on any flight for the purpose of public transport.

4.2.2 In practice, the Schedule 9 tests for renewal of Instrument and Aircraft Ratings are integrated within the operator's bi-annual competency checks (proficiency checks). Operators are therefore required to train and subsequently appoint pilots from within the Company as AEs and Approved Persons (Simulator Instructors). The following appointment and subsequent career progression is therefore recommended for training and check personnel:

(a)
Line Training Captain

(b)
Type Rating Instructor – Simulator (TRI – Simulator)

(c)
Type Rating Examiner/Instrument Rating Examiner - Simulator Only [TRE/IRE - Simulator Only (Exclude Simulator Base Training (SBT)]

(d)
Type Rating Examiner/Instrument Rating Examiner - Simulator Only (Include SBT) [TRE/IRE – Simulator Only (Include SBT)]

(e)
Type Rating Examiner/Instrument Rating Examiner – Aircraft and Simulator (TRE/IRE – Aircraft and Simulator)

4.3
Line Training Captain

4.3.1 The role of the line training captain is vitally important in a balanced training regime. Much of the responsibility for the standardisation of operating procedures and for sound flight deck management will depend on the observations and analytical skills of the line training captains. The importance of line training and testing cannot be over emphasised and the calibre of the staff should reflect this. Specific responsibilities may include sectors operated under supervision following type conversion, final line checks, annual line checks and renewal of Captain's 35 day recency.

4.3.2 A line training captain shall hold an appropriate licence and ratings and a valid medical certificate. As a general guideline, a line training captain is expected to have a minimum of 2,000 hours flight time as a pilot of multi-engined aeroplanes or as a helicopter pilot, of which at least 500 hours as the pilot-in-command and completed training specified in the company manual for the appointment.

4.4
TRI – Simulator

4.4.1 The duties of a "TRI – Simulator" include the conduct of simulator training exercises during initial type conversion including low visibility operations. They may also include Schedule 11 bi-annual competency and instrument approach-to-land (including low visibility operations) tests, and renewal of three monthly recency in simulators approved for that purpose.

4.4.2 Prior to appointment, a "TRI – Simulator" must complete an approved course in instructional techniques, and also induction training in his duties. He is to be observed by an Operations Inspector while conducting Schedule 11 items prior to appointment as an Approved Person, and again on renewal. However the renewal of this appointment may be delegated to a company AE, in which case the airline is to advise the Department when the renewal is complete so that a renewed certificate can be issued.

4.5
TRE/IRE - Simulator Only (Exclude SBT)

4.5.1 Persons nominated to be “TRE/IRE - Simulator Only (Exclude SBT)” must complete an approved course in instructional and examining techniques, and also induction training in their duties. They will then be observed by an FOI while conducting simulator tests for Schedule 9 and Schedule 11 ratings prior to appointment as Authorised Examiners (Simulator). However the “TRE/IRE – Simulator Only (Exclude SBT)” may not conduct SBT.

4.6
TRE/IRE – Simulator Only (Include SBT)

4.6.1 Persons nominated to be “TRE/IRE – Simulator Only (Include SBT)” must complete induction training in their duties. For the initial appointment as a “TRE/IRE – Simulator Only (Include SBT)” and on each subsequent type change, they must be observed by an FOI while conducting Base Training (BT) in the simulator for the appointment as “TRE/IRE – Simulator Only (Include SBT)” for that type. The FOI will observe the TRE operating from both control seats.

4.7
TRE/IRE - Aircraft and Simulator

4.7.1 Persons nominated to be “TRE/IRE – Aircraft and Simulator” must complete induction training in their duties. For the initial appointment as a “TRE/IRE – Aircraft and Simulator” and on each subsequent type change, they must be observed by an FOI while conducting tests in an aircraft for the issue of aircraft ratings prior to appointment as Authorised Examiners (Aircraft) for that type. The FOI will observe the TRE operating from both control seats. However when the TRE subsequently endorses on an additional family type with the same number of power plants i.e. A320/A330, then the aircraft check may be completed from either control seat. The authority to conduct tests by the “TRE/IRE – Aircraft and Simulator” also includes SBT and Aircraft Base Training (ABT).

4.7.2 AEs who fly two aircraft types that are classified for mixed fleet flying (MFF), will be observed on each type for initial **CAD** authorisation. Subsequent AE renewal may be undertaken on either type and will be valid for both, provided the AE maintains recency on both types.

4.8
Validity of Appointments and Recency Requirements

4.8.1 **Validity of appointments**

TRE/IREs and Approved Persons will normally be appointed by the Department for a maximum period of 3 years, and normally a shorter period for those employed by training organisations and manufacturers based outside of Hong Kong. Both may be subject to review at more frequent intervals by the Department and additional requirements under paragraph 4.9 of this Chapter. Operators are responsible for ensuring that the competence of training staff appointed by them to discharge the operator’s responsibilities under Schedule 11 of the AN(HK)O is kept under regular review.

4.8.2 **Recency Requirements**

An AE is required during each and every 12-months period to conduct the following minimum number of aircraft/simulator details, in order to retain validity:

(a)
TRE/IRE – Simulator Only (Exclude SBT)
Four separate simulator sessions, which include Instrument Rating Renewal (IRR)/Aircraft Rating Renewal (ARR) or Aircraft Rating (AR) tests during each session.

(b)
TRE/IRE – Simulator Only (Include SBT)
Four separate simulator sessions, two of which will consist of Zero Flight Time (ZFT) training and testing and two separate simulator sessions, which include AR and/or Instrument Rating (IR) test.

(c)
TRE/IRE – Aircraft and Simulator
A minimum of two Base Training sessions, one of which may be a simulator ZFT session and a minimum of two simulator sessions that include tests for IRR/ARR or initial AR tests.

Note: An AE who has not met the minimum requirements must report the circumstances to the **CAD** so that the continued validity of his appointment can be considered. The TRE/IRE may then be advised of any recency revalidation requirements and/or the reissue of the LoA. Failure to make such a report may invalidate subsequent tests.

4.8.3 Waivers may be given by the Department to the instructional and examining techniques requirements for nominees with acceptable previous experience and qualifications. On conversion to a new type, TRE/IREs must normally complete the induction training and observation requirements specified in paragraphs 4.6 and 4.7.

4.9
Training Organisation Approved by a Foreign National Aviation Authority (NAA)

4.9.1 This paragraph must be read in conjunction with paragraph 1.5 of this Chapter, which contains the general requirements for an operator to outsource the training to a training organisation or manufacturer.

4.9.2 In general, personnel utilised by a training organisation or manufacturer acceptable to **CAD** will normally be required to meet the qualification, training, approval and validity requirements listed in the paragraphs 4.1 - 4.8. For personnel utilised by a foreign approved training organisation, certain differences to qualification and validity requirements are listed below.

(a)
An examiner from an organisation nominated by an operator for appointment as an AE will require authorisation by **CAD**. This examiner shall possess a valid examiner approval issued by a foreign NAA acceptable to **CAD**. An authorisation will have a validity to be determined by **CAD** which may be shorter than 3 years from the month of appointment or renewal. Operators are reminded that they must submit a request for the appointment of an AE in accordance with paragraph 4.1.10.

(b)
For an operator who has obtained **CAD's** approval to use a foreign approved organisation for recurrent training and checking and has obtained **CAD's** agreement to undertake bi-annual testing in aircraft, appointment of AEs for "TRE (aircraft only)" or "TRE/IRE (aircraft only)" may be considered. Their qualification, training, appointment requirements must be agreed with the operator's FOI. Their recency requirements are as follows :-

(i)
TRE – Aircraft Only
Two separate aircraft training sessions of which at least one must include a test for a Hong Kong licence rating.

(ii)
TRE/IRE – Aircraft Only
Two separate aircraft training sessions, one or both of which include an IRR/ARR or AR test.

The authority for the above AE will be considered case-by-case.

(c)
TRI – Simulator. A TRI employed by an **approved** organisation outside Hong Kong, may be qualified to conduct simulator training without the necessity of formal **CAD** approval.

(d)
A TRI required to conduct tests in accordance with AN(HK)O Schedule 11, will need **CAD** approval.

(e)
Personnel used for Safety Equipment and Procedure training will require **CAD** approval if required by the operator to conduct AN(HK)O Schedule 11 tests.

4.9.3 *Course Completion Certificate.* Upon completion of any outsourced training, an operator must obtain a certificate from the contractor, confirming that the ground and/or simulator training course has been completed to the satisfaction of the approved organisation.

5
SUPERVISION OF EXAMINERS

The procedures to be followed and standards to be applied by AEs are set out in **CAD** 170 “Authorised Examiners Handbook”. Inspectors will observe the conduct of tests by AEs, and of crew training generally, during the currency of an Air Operator’s Certificate. The purpose of these inspections is to ensure that training and testing is in compliance with the operator’s training manual and within the terms and conditions of the appointment of **CAD** AEs.

6
PROBLEMS OF SMALL OPERATORS

The arrangements discussed in the foregoing paragraphs may not be practicable in the case of a very small organisation operating one or two aircraft and employing a small number of aircraft flight crews. In larger organisations employing several pilot examiners, one can test the other and there is no real difficulty. However, where the total complement of pilots warrants only one examiner, arrangements should be made for his periodical tests to be conducted by an independent examiner outside the operator’s organisation; in such cases the Department should be notified. The Department will then assess the suitability of the nominated independent examiner and, if acceptable, make arrangements for the issue of the appropriate LoA. Once the identity of the independent examiner has been agreed upon, the operator must send a letter of agreement to the Department covering the arrangement made.

7
PART TIME AND 'FREELANCE' CREW MEMBERS
7.1
Operators should ensure the competence of any part-time or 'free-lance' pilots they employ. Schedule 11 tests carried out to establish the competence of an operator's pilots, must be conducted either by the operator himself or by another operator, under arrangements detailed in the company's training manual and agreed by the Department, which ensure that the pilot is competent to perform all the duties and responsibilities laid upon him by the operator.
7.2
Additionally, the operator must satisfy himself that the flight crew member is fully conversant with the company's operations manual and flight procedures. In the case of Captains, route competency must also be established and certified. In all cases, flight and cabin crew must be tested as to their knowledge of emergency/survival drills and equipment. Operators must obtain certified copies of duty and rest period records for the 28 day period prior to the rostering of the crew members concerned, and appropriate flying duty records must be maintained for the period that the operator employs such crews.
8
OPERATION ON MORE THAN ONE TYPE OR VARIANT
(See Appendix B to Chapter 5)
8.1
Aeroplanes
(a)
An operator shall ensure that a flight crew member does not operate on more than one type or variant, unless the flight crew member is competent to do so.
(b)
When considering operations of more than one type or variant, an operator shall ensure that the differences and/or similarities of the aeroplanes concerned justify such operations, taking account of the following:
(i)
The level of technology;
(ii)
Operational procedures;
(iii) Handling characteristics.
(c)
An operator shall ensure that a flight crew member operating more than one type or variant complies with all of the requirements prescribed in Schedules 9 and 11 for each type or variant unless the Department has approved the use of credit(s) related to the training, checking and recency requirements.
(d)
An operator shall specify appropriate procedures and/or operational restrictions, approved by the Department, in the operations manual, for any operation on more than one type or variant covering:
(i)
The flight crew members' minimum experience level;
(ii)
The minimum experience level on one type or variant before beginning training for and operation of another type or variant;
(iii) The process whereby flight crew qualified on one type or variant will be trained and qualified on another type or variant; and
(iv) All applicable recency requirements for each type or variant.

8.2
Helicopters and Aeroplanes
(a)
When a flight crew member operates both helicopters and aeroplanes:
(i)
An operator shall ensure that operations of helicopter and aeroplane are limited to one type of each.
(ii)
The operator shall specify appropriate procedures and/or operational restrictions, approved by the Department, in the operations manual.
8.3
Cross Crew Qualified
If a flight crew member is to qualify on a type which is similar to a type on which he is currently qualified, his conversion training to the second type may be suitably abbreviated, subject to agreement with the Department. The crew member is then 'Cross Crew Qualified (CCQ)'. Details of the agreed abbreviated training course, and subsequent recurrent training, are to be specified in the operations manual.
8.4
Mixed Fleet Flying
A flight crew member who is Cross Crew Qualified may be allowed to operate both types ('Mixed Fleet Flying' or 'MFF') subject to agreement with the Department. Details of the agreed recency and recurrent training and testing requirements to enable the crew member to operate both types are to be specified in the operations manual.
9
RECURRENT TRAINING AND CHECKING
9.1
General
9.1.1 Line checks, route and aerodrome competency and recent experience requirements are intended to ensure the crew member's ability to operate efficiently under normal conditions, whereas other checks and emergency and safety equipment training are primarily intended to prepare the crew member for abnormal/emergency procedures.
9.1.2 The line check is normally performed in the aircraft. All other training and checking should be performed in the aircraft or an approved flight simulator or, in the case of emergency and safety equipment training, in a representative training device. The type of equipment used for training and checking should be representative of the instrumentation, equipment and layout of the aircraft type operated by the flight crew member.
9.1.3 The line check is considered a particularly important factor in the development, maintenance and refinement of high operating standards, and can provide the operator with a valuable indication of the usefulness of his training policy and methods. Line checks are a test of a flight crew member's ability to perform a complete line operation satisfactorily, including pre-flight, taxi operations and active runway identification, and post- flight procedures and use of the equipment provided, and an opportunity for an overall assessment of his ability to perform the duties required as specified in the operations manual. The route chosen should be such as to give adequate representation of the scope of a pilot's normal operations. When weather conditions preclude a manual landing, an automatic landing is acceptable. The line check is not intended to determine competence on any particular route.

9.1.4 In addition to the above duties, flight crew members should be assessed on their crew resource management skills. The Captain, or co-pilot acting as the Captain, should also demonstrate his ability to "manage" the operation and take appropriate command decisions. When assessing crew resource management skills, the examiner should occupy an observer's seat.
9.1.5 When a flight simulator is used for proficiency training and checking, the opportunity should be taken, where possible, to use Line Orientated Flight Training (LOFT).
9.1.6 Emergency and safety equipment training should, as far as is practicable, take place in conjunction with cabin crew undergoing similar training, with emphasis on co-ordinated procedures and two-way communication between the flight deck and the cabin.

9.2
Periodic Competency Tests

9.2.1 The following is a full list of periodic competency training and tests which cover all Schedule 9 and 11 requirements, the results of which must be recorded on operators' forms:

(a) proficiency check (includes the aircraft Rating and Instrument Rating);
(b) line check;
(c) instrument approach-to-land proficiency check, including low visibility operations procedures where applicable;
(d) Captain's route and aerodrome competence;
(e) handling recency;
(f) safety equipment and procedures;
(g) Crew Resource Management (CRM) training.

9.3
Proficiency Check (PC)

9.3.1 Although the PC is a test, it provides an opportunity for exercising emergency drills which rarely arise in normal operations. The statutory Schedule 9 requirement is that pilots are tested and their competence be verified and certified. The PC is undertaken in an approved flight simulator and shall include testing of the Aircraft Rating (AR) and Instrument Rating (IR) (Schedule 9) together with relevant Schedule 11 items including the Instrument Approach to Land (IAL). Both Certificates of Test for the aforementioned Schedule 9 items shall be signed on satisfactory completion of the PC. When a simulator is not available, the operator should propose to **CAD** a system for completing the PC. However, it is **CAD** policy that in this event, a flight simulator should be used for each alternating PC. An example PC form is included in Appendix E.

9.3.2 **PC – Initial.** Prior to commencing public transport Line Flying Under Supervision (LFUS), the operator must be assured that a pilot is competent and has reached the required standards during his conversion course. Therefore, there must be a valid PC form included within the pilots training file. The senior management signed competency statement on the PC form is the culmination of a pilot's conversion training and is verification that the type technical ground phase, simulator phase and the aircraft Base Training if applicable have been completed satisfactorily and tested accordingly. It is confirmation that training has been undertaken during the conversion for all Schedule 11 items as listed below in 9.3.5 (b) and that the pilot has demonstrated competence in the use of all IAL systems that could be encountered either at destination or alternate airports. In particular, if circling approach procedures are approved for use, then these must be covered and competence demonstrated during the conversion. In the case of pilots who are required to be qualified in both control seats, they must demonstrate competence in both seats (DCA528 boxed items).

9.3.3 **PC – Recurrent.** The recurrent PC is required for the testing of Schedule 9 and Schedule 11 items within the relevant period. Because the items listed in paragraph (b) below may be undertaken over a three year period, operators should structure the PC with a defined program of six PCs over a three year period. The "structured" PC can result in more efficient use of simulator time. For example, with agreement with the operator's FOI, practice of LVO failures and reversions may be spread over the three year period. The Aircraft Rating Renewal (ARR) is normally a manually flown exercise however, in one or two of the six PCs it should be undertaken making maximum use of the aircraft automation in accordance with company SOP. The AN(HK)O requires that a pilot is tested for the types of instrument approaches to be used at destination or alternate airfields. The IAL tests for VOR/DME, LOC only, ILS BB, ADF, GPS and circling approaches can be covered over the three year period. However, if an operator's route structure involves operations to airfields where it is likely that circling approaches will be required, it is **CAD** policy that they shall be tested on at least three occasions during the three year PC cycle. On satisfactory completion of the PC, senior management must sign the competency certificate accordingly.

9.3.4 The avoidance of Controlled Flight into Terrain (CFIT) must be briefed and considered throughout each PC. The crew's situational awareness and recognition of their responsibility for terrain clearance despite conflicting ATC instructions must be emphasized during both the departure and arrival phases of the flight. The additional threats imposed by non-precision approaches must be covered.

9.3.5 The scope of the practice and check may be divided into three categories, as follows:

(a) Emergency manoeuvres in Instrument Meteorological Conditions (IMC) which must be carried out on each bi-annual check:

(i) a take-off with engine failure between V_1 and V_2 or as soon as safety considerations permit. When the check is carried out in an aircraft, instrument flight conditions should be simulated as soon as possible after becoming airborne;

(ii) a precision instrument approach to minima with one engine inoperative, followed by a missed approach;

(iii) landing with one engine inoperative. For single-engined aeroplanes a practice forced landing is required;

(iv) where the emergency drills require action by the non-handling pilot,

the check must also cover knowledge of such drills.
Note: When engine out manoeuvres are carried out in an aeroplane, the engine failure must be simulated.

(b)
Selected items from the following list should be covered on each PC, ensuring that all items are covered and recorded at least once within a three year period:

(i)
A rejected take-off (initiated at a speed no greater than 50% of V_1 when conducted in an aircraft);
(ii)
engine fire;
(iii) engine or propeller overspeed;
(iv) fuselage fire (pilot operated extinguishing system);
(v)
emergency operation of landing gear and flap;
(vi) pressurisation failure;
(vii) fuel jettison;
(viii) low fuel contents;
(ix) engine relight/restart;
(x)
hydraulic failures;
(xi) electrical failures;
(xii) engine and engine control malfunction;
(xiii) action following E/GPWS and TCAS warnings;
(xiv) action following predictive and windshear warnings;
(xv) pilot incapacitation - to be carried out annually;
(xvi) approach and landing with flying control or flight director system inoperative; and
(xvii) circling approaches.

Notes: 1. Some of the above items will need to be carried out by ‘touch drills’ and, if the check is carried out in an aircraft (rather than a simulator), they are normally best attended to on the ground.
2.
ACAS training for flight crew shall be established in accordance with ICAO Doc 8168 Part III Section 3 Chapter 3 and Attachment A.

(c)
A supplementary questionnaire on technical matters and operating procedures which, although not falling within the category of emergencies, are matters on which pilots should be tested at regular intervals. Typical items to be covered include:

(i)
recognition and diagnosis of aircraft system faults for which there are no set drills;

(ii)
radio failure procedures;
(iii) use of operations manuals, including Aerad/Jeppesen route guides;
(iv) familiarity with latest operations manual amendments, information circulars and aircrew instructions;
(v)

loading instructions;
(vi) knowledge of internal and external check lists;
(vii) aircraft equipment such as Flight Management System (FMS), navigation systems, E/GPWS, flight directors, weather radar etc;
(viii) noise abatement procedures;
(ix) precautions for winter operations, anti-icing procedures and operations from contaminated runways;
(x)
engine failure during stages of flight other than on take-off, especially critical phases such as noise abatement, a Standard Instrument Departure (SID) or over high ground or on approach;
(xi) wind shear recognition and avoidance.

NOTE: On most of the larger modern aircraft the list of items that might usefully be discussed is likely to be extensive and operators may prefer to deal with only a selection of items on a particular PC. In this event, a plan of items to be covered should be drawn up to ensure that all are dealt with over a three year period and records should be maintained accordingly. Some items may equally well be covered in the course of the line check. Advantage should also be taken of the opportunity to give pilots experience in the simulator of such rare occurrences as windshear, flapless landings and all engines out landings.

9.3.6 **Training Records**

9.3.6.1 An operator must ensure that flight crew are properly trained and tested in accordance with Schedules 9 and 11 of the AN(HK)O. It is therefore essential that proper, accurate and relevant records are kept of a pilot's initial training and testing.

9.3.6.2 The training records must be kept in the pilot's training file and securely retained in the operator's training department.

9.3.6.3 Prior to operating a public transport flight, and commencement of LFUS, the records must show that a pilot has satisfactorily completed the appropriate approved ground and flight simulator course and if applicable aircraft base training. It therefore follows that a valid PC form shall be part of the training records. They must show that the pilot is properly licensed with a Group 1 or P2X endorsement on his Hong Kong License and that all Schedule 9 and 11 and **CAD** 360 requirements have been met including evidence of competence in AEP/SEPT, RVSM, LVO, GPS approaches, RNP and any special airspace qualification, CRM, route and airfield qualification.

9.3.6.4 Once a pilot commences LFUS, appropriate line sector records and the Final Line Check form must be in the training file.

9.3.6.5. After a pilot has completed his first recurrent PC, his conversion training records may be archived. However, the training file must always include a valid PC, Line Check and certificates to confirm qualification in accordance with Schedule 9 and 11 requirements.

9.3.6.5 It is acceptable to maintain all training records in an electronic format provided it is secure, with a satisfactory backup system and it has been agreed with **CAD**.

9.4
Proficiency Check – Cruise Only Co-Pilots (P2X)

9.4.1 P2X pilots must complete all Schedule 11 items for their respective aircraft types during the relevant period. In addition the Schedule 9 items namely the "boxed" items of the DCA 528 (AR) and the Instrument Rating (IR) must be completed to ensure that a P2X pilot is properly rated for his respective aircraft type(s). Both the AR and IR certificates are to be signed on satisfactory completion of the PC.

9.4.2 P2X pilots will not normally be exposed to aircraft handling below cruise altitude, therefore it is important that simulator training and refresher details cover all aspects of the normal and emergency operation of the aircraft.
9.4.3 Where an examiner judges the quality of any exercise to be only just acceptable, the operator should expose the subject to more frequent PCs and training. This is particularly true of young inexperienced pilots who may need reassurance that such training and checks are a normal part of operating life.

9.5
Line Checks - All Pilots

9.5.1 The annual line check is not intended to determine competence on any particular route. The requirement is for a test of ability to perform satisfactorily a complete line operation from start to finish, including pre-flight and post-flight procedures and use of the equipment provided. The route chosen should be such as to give adequate representation of the scope of a pilot's normal operations. The line check is considered a particularly important factor in the development, maintenance and refinement of high operating standards and can provide the operator with a valuable indication of the efficacy of his training policy and methods.
9.5.2 The operator has a statutory obligation to check that his pilots are competent to perform their duties. If it is company policy that both pilots may carry out either the handling or the non-handling duties, both Captains and co-pilots should be checked in both roles. Captains who also operate as co-pilots must be checked in both left and right hand seats.
9.5.3 In addition to the above duties, the flight crew should be assessed in CRM techniques, including command decision making. This is most readily achieved if the examiner occupies the jump seat.

9.5.4 When line checks are carried out on sectors which terminate away from base, the operator should allow for the possibility that on subsequent sectors the examiner may have to act as substitute for either the Captain or co-pilot. The examiner should therefore be fully qualified to operate at any crew station over which he acts in an examining capacity.
9.5.5 Line checks fall into two categories as follows:

(a)
FINAL line check: Following completion of route flying 'under supervision', a two sector line check, one handling and one non-handling (one combined sector for holders of P2X ratings) will be flown with a training captain at the controls. If successful, the 'under supervision' restriction is removed and re-certified as such on the candidate's records.

(b)
ANNUAL line check: This will normally take the form of a two sector line check, one handling and one non-handling check (one combined sector for holders of P2X ratings) and may be accomplished in one of two ways. Firstly, the training captain may occupy a seat at the controls and fly as Captain; secondly, he may occupy the jump seat and run a concurrent check on the operating crew (but see paragraph 9.5.6 below). He could not in this case be PIC. It should be noted that a Training Captain's Line Check must consist of a minimum of three sectors – one handling in each of the left and right seat and one non handling.

9.5.6 Should a pilot run out of check or fail a line check, he may not operate on a public transport flight except 'under supervision' until he is again fully qualified. All such supervised flying, and the line check required for requalification, requires a training captain to be at the controls.

9.6

Captains and Co-Pilots - Instrument Approach Proficiency

9.6.1 A further separate requirement to be met in respect of the Captain and copilot is that they must have been tested as to their proficiency in using instrument approach systems of the type in use at the aerodrome of intended landing and any alternate aerodrome; this will also include Low Visibility Operations (LVO) procedures, where applicable. The tests may be carried out in a flight simulator approved for the purpose. The instrument approach to land tests (non-LVO) may also be carried out in flight in actual or simulated IMC.

9.6.2 To comply with this requirement, operators may find it convenient to ensure that Captains and co-pilots are tested on their proficiency to carry out instrument approach procedures using all the pilot interpreted aids provided in the aircraft they operate. A separate test or record to cover the requirement may not be necessary, as it is possible to meet the regulation in the course of the bi-annual Proficiency Check by the inclusion of an NDB, VOR, GPS, LOC only or ILS Back Beam approach.

9.6.3 On suitable aircraft types where electronic instrumentation allows portrayal of both the NDB and the VOR angular deviation as either a needle or a beam bar presentation, the requirement for VOR and NDB can be combined and satisfied on conversion, provided the pilot has been tested performing one non-precision approach using a beam bar, and another using the needle.

9.6.4 The Constant Descent Final Approach (CDFA) is the preferred method for conducting a non-precision instrument approach. This technique should be utilised whenever possible in high performance transport aircraft as it is conducive to a stabilised approach and landing.

9.7

Captains - Route and Aerodrome Competence

9.7.1 An operator must ensure that the pilot designated as Captain of an aircraft has demonstrated to the operator's satisfaction adequate knowledge of the route to be flown and of the aerodromes (including alternates), facilities and procedures to be used. The period of validity of the route and aerodrome competence qualification is 13 months. However, the qualification may be re-validated during that period by operating on the route or to the aerodrome concerned.

9.7.2 Route competence training should include knowledge of:

(a)
terrain and minimum safe altitudes;

(b)
seasonal meteorological conditions;

(c)
meteorological, communication and air traffic control facilities, services and procedures;

(d)
navigational facilities associated with the intended route of flight;

(e)
search and rescue procedures.

9.7.3 Depending on the complexity of the route, as assessed by the operator, the following methods of familiarisation may be used:

(a)

for the less complex routes, familiarisation by self briefing with route documentation or by means of programmed instruction; and

(b)

for the more complex routes, in addition to (a) above, in flight familiarisation as a co-pilot, observer or Captain under supervision, or familiarisation in an approved flight simulator using a data base appropriate to the proposed route.

9.7.4 The operations manual should specify a method of categorisation of aerodromes and specify the qualification requirements for each of these categories. If the least demanding aerodromes are Category A, Category B and C should be applied to progressively more demanding aerodromes. The operations manual should specify the parameters which qualify an aerodrome to be considered as Category A and then provide a list of those aerodromes categorised as B and C.

9.7.5 All aerodromes an operator intends to use should be categorised in one of those three categories. Such categorisation must be acceptable to the Department and based on the following guide lines.

9.7.6 *Category A*. An aerodrome which satisfies all of the following requirements:

(a)

an approved instrument approach procedure;

(b)

at least one runway with no performance limited procedure for take-off and/or landing;

(c)

published circling minima not higher than 1000 feet above aerodrome level; and

(d)

Night operations capability.

9.7.7 *Category B*. An aerodrome which does not satisfy the Category A requirements or which requires extra considerations such as:

(a)

non-standard approach aids and/or approach patterns; or

(b)

unusual local weather conditions; or

(c)

unusual characteristics or performance limitations; or

(d)

any other relevant considerations such as obstructions, physical layout, lighting etc.

9.7.8 *Category C*. An aerodrome which requires additional considerations to a Category B aerodrome.

9.7.9 Prior to operating to a Category B aerodrome, a Captain should be briefed, or self briefed by means of programmed instruction, on the Category B aerodrome(s) concerned and should certify that he has carried out these instructions.

9.7.10 Prior to operating to a Category C aerodrome, a Captain should be briefed and visit the aerodrome as an observer and/or undertake instruction in a flight simulator approved by the Department for the purpose. The instruction should be certified by the operator.

9.8

Recent Type Experience (Handling Recency)

9.8.1 A pilot whose Hong Kong Licence includes a valid and appropriate aircraft rating Certificate of Test for the aircraft type, and who has been certified by the said pilot's

Hong Kong AOC operator as being competent to perform duties as commander or co-pilot shall have maintained take off and landing recency if within the 3 months, which immediately precedes the commencement of the public transport flight, the said pilot has completed a minimum of 3 take offs and 3 manual landings, in the aircraft of the type to be used on the flight. For revalidation of the 3-month take-off and landing recency, operators shall refer to Appendix F of this Chapter.

9.8.2 A Captain shall also have made, in the preceding 35 days, at least one complete flight involving one take-off and landing in an aircraft of the type to be used on the flight. In some cases, approved flight simulators may be used, but operators should consult their assigned Inspector before using flight simulators for this purpose. A Captain may revalidate his 35 day recency by carrying out a take-off and landing during a public transport flight provided he is not operating as Captain on that flight.

9.8.3 **Helicopter** pilots require 2 hours simulated or actual instrument flight in the preceding 60 days to achieve instrument recency; this may be extended to 90 days if the pilot has undergone, during the preceding 30 days, at least one hour in a simulator approved for the purpose of instrument rating renewal. Four approaches, appropriate to company operations, which may include flight simulator approaches in a simulator approved for instrument rating renewals, must be flown during the preceding 90 days.

9.8.4 Instrument rated helicopter pilots who are predominantly used on VMC operations require 2 hours simulated or actual instrument flight during the preceding 60 days; 2 instrument approaches during the preceding 60 days, which should include at least 1 instrument approach during the preceding 30 days.

9.9

Pilot Qualification for Operations in Either Seat

9.9.1 Pilot Flying duties (PF) including take offs and landings, may only be completed from the seat in which the PC was completed. Any Captain required to complete PF duties from the right-hand seat must complete additional training and testing as specified in **CAD** 360 and in the operator's training manual, concurrent with the operator's competency checks prescribed in Schedule 11. This additional training which normally will be conducted during the PC must include at least the following:

(a)
an engine failure during take-off;
(b)
a one engine inoperative approach and go-around; and
(c)
a one engine inoperative landing.

Note: The designated Captain for the flight will operate from the left-hand seat except when as a Training Captain he/she is required to conduct LFUS sectors from the right-hand seat.

9.9.2 When operating in the right-hand seat, the checks required by Schedule 11 for operating in the left-hand seat must, in addition, be valid and current.

9.9.3 A pilot relieving the Captain must demonstrate practice of drills and procedures, concurrent with the operator's competency checks prescribed in Schedule 11, which would otherwise have been the Captain's responsibility. Where the differences between left and right seats are not significant (for example because of use of autopilot) then practice may be conducted in either seat.

10

USE AND APPROVAL OF FLIGHT SIMULATORS AND TRAINERS

10.1 Provision is made in the AN(HK)O for use of apparatus such as flight simulators, flight trainers and fuselage 'mock-ups' for certain periodical tests. These devices must be individually approved by the Department and may be used only under the supervision of a person approved for the purpose. Approvals normally restrict the use of such devices to the particular company's own flight crews. Examiners' simulator authority extends only to the device(s) for which the company named on this authority holds a specific written approval.

10.2 All training staff should be instructed that training and checking exercises conducted in simulators and flight trainers should be treated from a flight safety aspect as if they were being carried out on an actual aircraft. Therefore, close adherence to established operating procedures and practices, particularly crew monitoring, call-outs and incapacitation procedures should be emphasised. Practising or continuing unsafe manoeuvres should be strongly discouraged.

10.3 Prior to each simulator session, examiners should check the serviceability in the technical log and the level to which the simulator is cleared, as it may change from time to time and at short notice. Additionally, a careful check should be made of the F528 attached to the approval document to confirm the simulator's validity for checks and tests.

11
GENERAL CONSIDERATIONS FOR TESTS

11.1 Any method of simulating instrument flight conditions for the purpose of testing pilots must be approved by the Flight Operations Inspectorate and, in the case of screens attached to the structure of the aircraft, approval must also be obtained from the Airworthiness Office of the **CAD**.

11.2 Instrument flight conditions may not be simulated on any flight for the purpose of public transport of passengers, nor may any emergency manoeuvres be simulated on such a flight.

11.3 Stopping of engines in flight should be subject to the recommendations and advice issued by the Department. Guidance can be obtained from the assigned inspector.

12
SAFETY EQUIPMENT AND PROCEDURES (SEP)

12.1 The purpose of emergency and survival training and testing is to provide flight deck crews with the necessary skills and knowledge to deal with different types of emergency and survival situations. A successful aircraft evacuation depends heavily on effective communications between the flight crew and the cabin crew.

12.2 Operators are to ensure that they have an established procedure for all flight deck crew to receive instruction on any new emergency and survival equipment that is introduced.

12.3 Operators may use either an aircraft or a 'mock-up' for emergency training and testing. Details regarding the approval of training apparatus and the approval of personnel responsible for conducting the training and testing on the equipment are contained in Chapter 6 'Emergency and Survival Training Practice and Testing Requirements for Flight Crew and Cabin Attendants'.

12.4 Suitable training aids will facilitate the presentation of both classroom and practical sessions. Inspectors may wish to observe the training, practice and tests in progress.

12.5 Before flying training commences on an actual aircraft, flight crew are to complete successfully the training, tests and practice described in Chapter 6 which must have been certified in the trainee's records.

13
RECORDS OF TRAINING AND TESTS

13.1 Records showing a trainee's progress through each stage of training must be maintained. These should indicate the number of times each exercise in base and line training was covered and should include information about the results of tests. Records must incorporate certificates indicating the competence of examinees to perform the duties in respect of which they have been tested. Inspectors will advise operators on the form of records and certificates.

13.2 Operators must keep records for all aircraft flight crew members showing the dates on which tests, ratings, medical certificates, licences etc are all due for renewal. There should also be an effective system to guard against aircraft flight crews being rostered for duty, when checks etc are overdue, and for verifying that licences etc have been renewed at the appropriate time.

13.3 Where Schedule 9 and Schedule 11 tests are integrated as described in paragraph 4.2.2, the operator may use combined report forms subject to agreement of the format by the Department.

13.4 Records of all conversion courses and recurrent training and testing must be made available, on request, to the flight crew member concerned.

13.5 A person must be nominated as responsible for the maintenance of training records and be identified as such in the operations manual.

NOTE: A full list of Schedule 9 & 11 tests, their sources and periods of validity is at Appendix A to this Chapter.

14
RETRAINING AND RETESTING

14.1 Operators must ensure that training staff are adequately instructed on the action to be taken when unsatisfactory performance by a crew member, either during training or line operations, leads to retesting or further training. For example, following an unsatisfactory base check, a crew member should not be immediately subjected to a series of retests in the item(s) concerned until an acceptable standard is achieved. If the failure points to a fundamental weakness in ability or technique, adequate remedial training should be given before further testing.

14.2 If a crew member is found to be unsatisfactory during the course of line operations, the Captain should report the circumstances without delay and the crew member should be withdrawn from further duty until retraining and/or retesting has been carried out. A record should be kept of any action taken.

15
FLIGHT CREW CONVERSION TRAINING

15.1 **Syllabi**

All type conversion training should be conducted in accordance with detailed syllabi included in the training manual. The syllabi should be designed to reflect the experience level of the trainee. This could be low and therefore provision should be made to give sufficient training by allowing extra time, when necessary, to reach and maintain a safe operating standard. When considering programmes and syllabi for newly acquired aircraft types, operators are strongly urged to consult the Flight Operations Inspectorate at the outset. Early consultation will help to prevent difficulties and inconvenience to the operator.

NOTE: Amendments or additions to the training manual relating to training experience, practice and periodical tests on a newly acquired aircraft type must be submitted to the Department **before** the aircraft may fly for the purpose of public transport.

15.2 **Minimum Experience Requirements**

The minimum standards of qualifications and experience required of flight crews before being rostered for conversion training should be specified in the training manual.

15.3 **Ground Training**

15.3.1 Great importance is attached to technical training and there should be a properly organised programme of ground instruction by competent tutors with adequate facilities, including any necessary audio, mechanical and visual aids. If the aircraft concerned is relatively simple, private study may be adequate, if the operator provides suitable manuals and/or study notes. Inspectors will wish to examine premises and equipment to be used for ground training. They are also authorised to be present while tuition and lectures are in progress.

15.3.2 Courses of ground instruction for flight crews should incorporate written progress tests at the end of each distinct phase. Pilots, for example, should be examined on such matters as engines, airframes, flight director systems, radio and electrics, performance and flight planning, as each phase of ground training is completed.

15.3.3 For all flight crews, the ground course should include comprehensive instruction on the location and use of all emergency equipment carried in the aircraft and practice in the procedures for emergency evacuation, and procedures on taxi operations and active runway identification.

15.3.4 The annual 'emergency/survival' test detailed in Chapter 6 should be undertaken before any flying training is started.

15.3.5 Once an operator's conversion course has been commenced, a flight crew member should not undertake flying duties on another type or class of aircraft until the course is completed or terminated.

15.4 **Aircraft/Flight Simulator Training**

15.4.1 Flying training should be structured and sufficiently comprehensive to familiarise the flight crew member thoroughly with all aspects of limitations and normal/abnormal and emergency procedures associated with the aircraft, and should be carried out by suitably qualified TRIs and/or TREs. For specialised operations such as ETOPS, LVO or steep approaches, additional training should be carried out.

15.4.2 In planning training on aircraft types with a flight crew of two or more, particular emphasis should be placed on the practice of LOFT with emphasis on CRM.

15.4.3 Normally, the same training and practice in the flying of the aircraft should be given to co-pilots as well as Captains. The 'flight handling' sections of the syllabus for Captains and co-pilots alike should include all the requirements of the appropriate type rating tests together with the following items, if appropriate to the aircraft type. For co-pilots holding a P2X type rating whose duties are to be limited to 'cruise only', ie above FL 200, training is to be limited to an approved flight simulator.

(a)
aeroplanes:
(i)

visual circuits and landings by day and by night, including approaches
without glideslope guidance and correction of displacement in
azimuth and elevation on final approach;
(ii)
visual 'go around' from not more than 200 ft agl;
(iii) engine failure before V_1;
(iv) take-off with engine failure between V_1 and V_2, or as soon as safety
considerations permit;
(v)
in instrument flight conditions with an outboard engine inoperative, a
full manual ILS procedure, including a holding pattern, to decision
height followed by a go-around;
(vi) landing with one engine inoperative;
(vii) landing with asymmetric reverse thrust;
(viii) failures of flight director system, including ILS approach without
flight director;
(ix) a typical noise abatement procedure;
(x)
approach to the stall and recovery, including operation of any stall
warning devices and/or stick pusher;
(xi) emergency decent with and without use of autopilot;
(xii) automatic approach/landing training including disconnects at critical
stages of approach and landing;
(xiii) use of autothrottle in manually controlled flight; and

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(xiv) taxi operations and active runway identification.
(b)
helicopters:
(i)
practice of appropriate type rating test items under instrument flight
conditions, including failure of flight instruments and flight directors;
(ii)
recovery from unusual attitudes under instrument flight conditions.

15.4.4 Each exercise should be practised until a satisfactory standard is achieved. The various take-off, 'go-around' and landing exercises should be performed at least twice. Records kept by the operator should show the number of times that each exercise was covered. Unless the type rating training programme has been carried out in an appropriate flight simulator approved for zero flight time conversion, the training must include at least 3 take-offs and landings in the aircraft.

15.4.5 Particular emphasis should be placed on the practice of correct flight crew procedures for take-off, approach, landing and 'go-around' plus, for helicopter pilots, the procedures for IMC descent en-route in conditions of low cloud and poor visibility.

15.4.6 Pilots undergoing conversion training should at some stage be given an exercise in coping with incapacitation of another flight crew member.

15.5 **Additional Requirements for Captains**

15.5.1 Without prejudice to any of the requirements of a particular type rating test, the conversion training of Captains should include the following items insofar as they may be appropriate to the aircraft type:
(a)
landing with two engines inoperative;

(b)
landing without flap/slat or with restricted flap;
(c)
landing with flying control system malfunction;
(d)
instrument approach and 'go-around' with flight director malfunction;
(e)
landing at night with one engine inoperative;
(f)
crosswind take-off and landing.

15.5.2 Captains must also be given practice in the stopping and starting of engines in flight and in any emergency drills that might fall to them while the co-pilot is handling the aircraft.

15.6 **Additional Requirements for Co-Pilots**

It is essential that co-pilots (in addition to the handling practice already referred to) should be given adequate training, during the simulator conversion course, in the execution of all emergency drills that might fall to them while the Captain is flying the aircraft. Co-pilots should also be given practice in the operation of aircraft systems and radio equipment normally managed by the co-pilot, while the Captain is handling the aircraft.

15.7 **Tests After Flying Training**

15.7.1 Before they are assigned to line duty (whether under supervision or not) all flight crew must be certified as competent by the operator in accordance with the requirements of Schedule 11 Part B of the AN(HK)O. Testing in these functions and duties **must not** be conducted in the course of normal operations. All conversion flying training must therefore incorporate a PC and an instrument approach-to-land PC before a flight crew member is assigned to line duty.

15.7.2 Before they are assigned to line duty all flight crew must complete LFUS and a line check on the new type. It is accepted, however, that this check could begin and end at the same aerodrome, may be of relatively short duration and may be made as part of the conversion training. It is essential, nevertheless, that pilots should demonstrate proficiency in the flight planning procedures for the new type, ability to operate in accordance with an IFR air traffic clearance whilst performing normal functions on the flight deck, as well as proficiency in the use of the installed radio and radar aids. Furthermore, all flight crew members must demonstrate their proficiency in operating the aircraft as both PF and PNF from the control seat in which they completed their PC. However, a Line Training Captain, need complete only one PNF sector. Following a satisfactory line check the operator must certify the pilot's competence, to operate as Captain or co-pilot.

15.8 **Line Flying Under Supervision (LFUS)**

15.8.1 For all aircraft conversion courses (non ZFT), the first LFUS flight must be within three months of the completion of the simulator course. Each flight crew member should operate a minimum number of sectors and/or flying hours under the supervision of a flight crew member nominated by the operator and acceptable to the Department.

15.8.2 The minimum sectors/hours should be specified in the operations manual and should be determined by the following:
(a)
previous experience of the flight crew member;
(b)

complexity of the aircraft; and
(c)
the type and area of operation.
15.8.3 The ‘under supervision’ period should not be used for the completion of the basic conversion syllabus. Its purpose is twofold. Firstly, it will enable the newly converted crew member to settle down to his duties on the new type in the company of an experienced and suitably qualified crew member specially designated for the purpose and to turn to him for advice, if necessary. Secondly, it will enable the training staff to assess and verify the adequacy of the conversion training and to ensure that proper operating standards are achieved at the outset, in the course of normal and varied operations.

15.8.4 ‘Under supervision’ means:
(a)
for a Captain flying with an experienced pilot, qualified to act as the aircraft Captain and specially designated by the operator to act as a supervising pilot, who should occupy the seat and perform the duties of co-pilot. Some operators may wish the newly converted Captain to operate a few sectors in the co-pilot’s seat; this is acceptable, if the supervising Captain is in the Captain’s seat and the new Captain carries out the additional requirements detailed in paragraph 9.9 of this Chapter;
(b)
for a co-pilot: flying in the co-pilot’s seat with a qualified Captain, specially designated for the purpose, occupying the Captain’s seat.
15.8.5 In some types of aircraft it may be necessary, while a co-pilot is flying his sectors under supervision, to carry a fully qualified co-pilot in addition. It must be clearly understood, however, that to meet the statutory requirements relating to the minimum flight crew to be carried, a pilot occupying the co-pilot’s seat must be qualified for all the duties to be performed in that seat. As in the case of line checks, supervisory staff should be qualified to take over in any crew role over which they exercise supervision.
15.8.6 On completion of the sectors under supervision a further line check is to be administered. If no flying ‘under observation’ is required (see paragraph 15.8.7), successful completion of the line check and acceptance by the operator of such a check will release a pilot to the line. The subsequent rostering together of two newly qualified pilots should be avoided wherever possible.
15.8.7 The ‘under supervision’ sectors carried out by a newly qualified Captain will have been completed with an experienced supervisory Captain acting as co-pilot. Some operators may therefore wish to carry out a further period of flying under observation after the final line check, teaming the new Captain with a standard crew and with a suitably qualified pilot, specially designated for the purpose, occupying the jump seat and acting only in an advisory capacity. It should be made clear that in this situation the newly qualified Captain is the Captain of the aircraft and will be certified as having passed a final line check. Similarly, operators may wish to consolidate a co-pilot’s training subsequent to his final line check, by using a qualified supervisory co-pilot or Captain in the jump seat and a Captain who has passed his final line check as the Captain of the aircraft, in the left hand seat. To avoid confusion, all such flying should be called ‘sectors under observation’. Before being released to the line, a post-observation check shall have been passed, and accepted by the operator.
15.8.8 Where the operator wishes to deviate from any of the minimum requirements in his training manual (perhaps because of a pilot’s previous experience on type with another

operator), this must not be authorised by the operator before consulting the Department
In any such case, training documentation should be annotated accordingly.

15.9 **Cruise Relief Co-pilots (P2X - rated)**

15.9.1 Co-pilots trained only for relief duties in the cruise may occupy a control seat above FL200. Minimum training and checking requirements are as follows:

(a)
conversion training and checking should follow the syllabus for a co-pilot, but excluding take-offs and landings in an aircraft. The Form DCA 528 items for a P2X aircraft type rating should be completed.

(b)
recurrent training and checking should be as prescribed in Schedule 11, but excluding take-off and landing proficiency. The items for a P2X Certificate of Test should be completed.

(c)
Take-off and landing recency as prescribed in Schedule 11 is not required. The pilot must, however, carry out flight simulator recency and refresher flying skill training at intervals not exceeding 90 days. This refresher training may be combined with recurrent training if desired.

15.10 **Use of a Flight Simulator for Conversion Training**

15.10.1 The extent to which a flight simulator may be used for conversion training will be considered according to individual circumstances.

15.10.2 It is essential that there is commonality of instrumentation and controls between the aircraft and the flight simulator used for conversion and recurrent training and testing. Where differences exist they will be subject to an agreement between the operator and the Department.

15.11 **Variants of the Same Aircraft Type**

A company may operate a number of aircraft which, though of the same type, are not identical. They may differ in engines, systems, equipment, flight deck lay-out, operating procedures, performance or in other respects. In such circumstances the operator must conduct a 'differences course' for his crews to ensure they are adequately trained on each variant. Operators should consult their assigned Inspector for advice on the form and content of such a course.

16
UPGRADE TO CAPTAIN

16.1 An operator shall ensure that for upgrade from co-pilot to Captain and for pilots joining as direct entry Captains:

(a)
a minimum level of experience acceptable to the Department is specified in the operations manual;

(b)
for multi-crew operations, the pilot completes an appropriate command course.

16.2 The content of the command course must be specified in the operations manual and should include at least the following:

(a)
flight simulator and/or flying training, including LOFT;

(b)
CRM training and Captain's responsibilities;

(c)

completion of an operator's PC acting as Captain;

(d)
line training in command under supervision. A minimum of 10 sectors is required for pilots already qualified on aircraft type;

(e)
completion of a Captain's line check and route and aerodrome competence qualifications.

17
BASE TRAINING REQUIREMENTS

17.1 Pilots undergoing CCQ conversion courses do not require ABT. In this case, the Blue DCA528 Form for Airbus "Family Aircraft" A320/330/340 CCQ Simulator Course shall be completed.

17.2 For non-CCQ conversion courses, the following Hong Kong Pilot Licence procedures will require ABT and the completion of the White DCA528 Form:

(a)
The initial application for a Hong Kong Professional Pilot's Licence;

(b)
P2X Upgrade to P1;

(c)
Application for an additional P1 aircraft rating in a Hong Kong Professional Pilot's Licence; and

(i)
The aircraft type from which he is transferring ("the previous type") and the aircraft type being applied are not of a "similar type". (Aircraft types for which the Hong Kong AOC holder had **CAD** approval for ZFT, are classified as "similar types"; or

(ii)
When the aircraft are of a similar type but:

(1)
The said pilot has less than 500 hours or less than 100 sectors on the previous type; and/or

(2)
The said pilot has not retained recency in any Hong Kong registered multi-engine turbojet aircraft for a period of 24 months or more.

17.3 For ZFT Simulator Conversion Courses, except as indicated in paragraphs 17.1 and 17.2 above, SBT is to be completed in accordance with the Yellow F528 Form. Operators shall refer to Appendix C for detailed information and requirements on simulator conversion courses.

17.4 By achieving 3 take-offs and 3 landings in the aircraft, either during base training (as required by paragraph 17.2 above) or during LFUS as permitted under paragraphs 17.1 and 17.3 above, the 3-month take-off and landing recency described in paragraph 9.8.1 of this Chapter is deemed to be established.

18 CREW RESOURCE MANAGEMENT (CRM) TRAINING

18.1 General

18.1.1 CRM is the effective utilisation of all available resources (e.g. crew members, aircraft systems and supporting facilities) to achieve safe and efficient operation. The objective of CRM is to enhance the communication and management skills of the crew member concerned. The emphasis is placed on the non-technical aspects of crew performance.

18.1.2 CRM training should include the following elements:

(a) statistics and examples of human factor related accidents;

(b) human perception, learning process, situational awareness;

(c) management of workload, tiredness or fatigue, and vigilance;

(d) management of stress;

(e) personality type, delegation, leadership, effective communication skills;

(f) the CRM loop (notion of synergy):
inquiry - advocacy - conflict resolution - decision making - critique - feedback;

(g) operator's standard operating procedures;

(h) effective communication and co-ordination within the crew, and between crew members and other operational personnel (air traffic controllers, maintenance personnel etc.);

(i) error chain and actions to break the error chain;

(j) implications of automation on CRM.

18.1.3 CRM training should also address the nature of the company's operations as well as the associated crew operating procedures. This will include areas of operations which present particular difficulties, adverse climatological conditions and any unusual hazards.

18.1.4 CRM training should include both classroom training and practical exercises including group discussions and accident reviews to analyse communication problems and instances of a lack of information or crew management.

18.1.5 Ideally, a CRM training course should last a minimum of 3 days, but, providing the whole syllabus is covered, a 2 day course is acceptable. An operator may use a course provided by another operator if that course is acceptable to the Department.

18.2 Initial Conversion Training

Operators should ensure that all flight crew complete a CRM course with a full length syllabus within 12 months of commencing airline operations. If a flight crew member undergoes a subsequent conversion course with the same or a change of operator he should complete the appropriate elements of the CRM course. The flight crew member should not be assessed either during or on completion of such a course.

18.3 **Recurrent Training**

18.3.1 Where an operator utilises LOFT in the recurrent training programme the flight crew member should complete elements of CRM training. Where an operator does not utilise LOFT, the flight crew member should complete elements of CRM training every year. The flight crew member should not be assessed.

18.3.2 An operator should ensure that flight crew members complete the major elements of the full length CRM course over a four year recurrent training cycle. This refresher training should not be assessed.

18.3.3 When a flight crew member undergoes an operator's competency check, line check or command course, then CRM skills should be included in the overall assessment.

18.4 **Combined Training**

18.4.1 Operators should, as far as is practicable, provide combined training for flight crew and cabin crew. There should be effective liaison between flight crew and cabin crew training departments, and provision should be made for flight and cabin crew instructors to observe and comment on each other's training.

18.4.2 The successful resolution of aircraft emergencies requires interaction between flight crew and cabin crew, and emphasis should be placed on the importance of effective co-ordination and two-way communication between all crew members in various emergency situations. Initial and recurrent CRM training should include joint practice in aircraft evacuation, so that all who are involved are aware of the duties other crew members should perform. When such practice is not possible, combined training should include joint discussion of emergency scenarios.

19

HELICOPTER PILOTS' PERIODIC TESTS

Cancelled – refers to CAD 360 Helicopter Supplement

20

FLIGHT OPERATIONS OFFICER / FLIGHT DISPATCHER

20.1 A flight operations officer / flight dispatcher should not be assigned to duty unless that officer has:

(a)
made within the preceding 12 months, at least a one-way qualification flight on the flight deck of an aeroplane over any area in which that individual is authorised to exercise flight supervision. The flight should include landings at as many aerodromes as practicable;

(b)
demonstrated to the operator a knowledge of:

(i)
the contents of the operations manual of the operator;

(ii)
the radio equipment in the aeroplanes used; and

(iii)
the navigation equipment in the aeroplanes used;

(c)
demonstrated to the operator a knowledge of the following details concerning operations for which the officer is responsible and areas in which that individual is authorised to exercise flight supervision:

(i)
the seasonal meteorological conditions and the sources of

meteorological information;
(ii)
the effects of meteorological conditions on radio reception in the aeroplanes used;
(iii)
the peculiarities and limitations of each navigation system which is used by the operation; and
(iv)
the aeroplane loading instructions;
(d)
demonstrated to the operator knowledge and skills related to human performance relevant to dispatch duties; and
(e)
demonstrated to the operator the ability to perform the duties specified in ICAO Annex 6 Part I Para. 4.6.

20.2 A flight operations officer / flight dispatcher assigned to duty should maintain complete familiarization with all features of the operation which are pertinent to such duties, including knowledge and skills related to human performance.

20.3 A flight operations officer / flight dispatcher should not be assigned to duty after 12 consecutive months of absence from such duty, unless the provisions of para. 20.1 are met.

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CHAPTER 5 - APPENDIX A

SUMMARY OF TEST REQUIREMENTS

AN(HK)O - SCHEDULE 9
(LICENCES & RATINGS)

ITEM	REFERENCE	VALIDITY	NOTES
Instrument Rating Certificate of Test (Renewal)	PART C para 3 & 4	13 Months	May be type specific. Valid from date final item completed. Refer **CAD** if expired more than 5 years.
Aircraft Type Rating Certificate of Test (Initial Grant)			

PART C
para 3 & 4
6 Months
All F528 items within 6 month period.
Valid from date final C of T item complete.
Aircraft Type Rating
Certificate of Test
(Renewal)
PART C
para 3 & 4
*# 6 Months
F528 “Boxed items” only
Valid from date final item completed.
Refer **CAD** if expired more than 5 years.
Certificate of Experience
PART C
para 5 & 6
6 Months
(Aerial Work)
Signed by “Authorised Person”
Validity for PPL - 13 Months

AN(HK)O - SCHEDULE 11
(PUBLIC TRANSPORT)

ITEM
REFERENCE
VALIDITY
NOTES
Proficiency Check
(Pilots)
PART B
1(2)(a)(ii)
*# 6 Months
Valid from date first item completed.
Line Check
(Pilots)
PART B
1(2)(a)(i)
*13 Months
Initial check reqd before line flying.
Handling & Non-handling sectors.
Instrument Approach to
Land
PART B
1(2)(c)(i)
# 6 Months
May be combined with IR renewal test.
LVO procedures may also be required.
Commander’s
Route Competence
PART B
1(5)(a) & (b)
13 Months
Briefing, simulator or visit.
No formal test requirement.
Handling Recency
PART B
1(2)(c)(ii)
3 Months
3 Take-offs & 3 Landings.
In Approved Simulator by Exemption.
Safety Equipment
& Procedures
PART B
1(1)(a) & (b)
13 Months
Must be completed and certified prior to any

flying training.

Notes # Valid 13 months from date of first test, if 2 tests, separated by not less than 4 months, are conducted in the period.
* Tests alternate where Mixed Fleet Flying is approved on similar types.

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CHAPTER 5 - APPENDIX B
OPERATION ON MORE THAN ONE TYPE OR VARIANT

1.
Single Pilot

1.1
When a flight crew member operates more than one aeroplane class, type or variant, but not within a single licence endorsement, an operator must comply with the following:
A flight crew member shall not operate more than:
(a)
Three piston engined aeroplane types or variants; or
(b)
Three turbo-propellor aeroplane types or variants; or
(c)
One turbo-propellor aeroplane type or variant and one piston engined aeroplane type or variant; or
(d)
One turbo-propellor aeroplane type or variant and any aeroplane within a particular class.

1.2
All Schedule 9 and 11 requirements for each type or variant operated unless the operator has demonstrated specific procedures and/or operational restrictions which are acceptable to the Authority.

2.
Multi Pilot

2.1
When a flight crew member operates more than one aeroplane type or variant within one or more licence endorsements, an operator shall ensure that:
(a)
The minimum flight crew complement specified in the operations manual is the same for each type or variant to be operated;
(b)
A flight crew member does not operate more than two aeroplane types or variants for which a separate licence endorsement is required; and
(c)
Only aeroplanes within one licence endorsement are flown in any one flight duty period unless the operator has established procedures to ensure adequate time for preparation.

Note: In cases where more than one licence endorsement is involved, see sub-paragraphs 2.2 and 3.1 below.
2.2
When a flight crew member operates more than one aeroplane type or variant, but not within a single licence endorsement, an operator must comply with the following:
2.2.1 Subparagraphs 2.1(a),(b) and (c) above;
2.2.2 Before exercising the privileges of two licence endorsements:

(a)
Flight crew members must have completed two consecutive operator proficiency checks and must have 500 hours in the relevant crew position in commercial air transport operations with the same operator;
(b)
In the case of a pilot having experience with an operator and exercising the privileges of two licence endorsements, and then being promoted to command with the same operator on one of those types, the required minimum experience as commander is six months and 300 hours, and the pilot must have completed two consecutive operator proficiency checks before again being eligible to exercise two licence endorsements.
2.2.3 Before commencing training for and operation of another type or variant, flight crew members must have completed three months and 150 hours flying on the base aeroplane which must include at least one proficiency check.
2.2.4 After completion of the initial line check on the new type, 50 hours flying or 20 sectors must be achieved solely on aeroplanes of the new type rating.
2.2.5 Schedule 11 recency requirements for each type operated unless credits have been allowed by the Department in accordance with sub-paragraph 2.2.7 below.
2.2.6 The period within which line flying experience is required on each type must be specified in the operations manual.
2.2.7 Where credits are sought to reduce the training and checking and recent experience requirements between aeroplane types, the operator must demonstrate to the Department which items need not be repeated on each type or variant because of similarities.
(a)
Schedule 9 requires two operator proficiency checks every year. When credit is given in accordance with sub-paragraph 2.2.7 above for operator proficiency checks to alternate between the two types, each operator proficiency check revalidates the operator proficiency check for the other type. Provided that the period between Licence proficiency checks does not exceed that prescribed for each type, the above requirements will be satisfied. In addition relevant and approved recurrent training must be specified in the operations manual.
(b)
Schedule 11 requires one line check every year. When credit is given in accordance with sub-paragraph 2.2.7 above for line checks to alternate between types or variants, each line check revalidates the line check for the other type or variant.
(c)
Annual emergency and safety equipment training and checking must cover all requirements for each type.
2.2.8 Schedule 9 for each type or variant operated unless credits have been allowed by the Department in accordance with sub-paragraph 2.2.7 above.
2.3

When a flight crew member operates combinations of aeroplane types or variants (class - single pilot and type - multi pilot), an operator must demonstrate that specific procedures and/or operational restrictions are approved in accordance with Chapter 5 paragraph 8.

3.
Single Pilot and Multi Pilot

3.1
When a flight crew member operates more than one aeroplane type or variant, but not within a single licence endorsement, an operator must comply with:

(a)
Subparagraphs 2.1(a), (b) and (c) above;

(b)
Subparagraph 2.2 above.

4.
Helicopters

When a flight crew member operates more than one helicopter type or variant, an operator shall ensure that appropriate procedures approved by **CAD** are included in the company operations manual.

5.
Type conversion training

Once an operator's conversion course has been commenced, a flight crew member shall not undertake flying duties on another type until the course is completed or terminated.

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CHAPTER 5 - APPENDIX C

ZERO FLIGHT TIME - SIMULATOR CONVERSION COURSE

1.
This appendix is not applicable to conversion courses under Cross Crew Qualification CCQ arrangement.

2.
SBT will be conducted by an IRE/TRE qualified for SBT or ABT who must meet the qualification and recency requirements in accordance with paragraph 4.8 of this Chapter.

3.
SBT requires the candidate to complete a minimum of 6 satisfactory take-offs and 6 satisfactory landings in a level D simulator approved for the purpose. The examiner is to occupy the other control seat.
4.
SBT is to include the following:
(a)
Take-off rotation technique.
(b)
Approach to land, the landing flare, thrust reduction/reverse thrust technique and braking technique.
(c)
Cross wind and tail wind techniques for take-off and landing.
5.
On satisfactory completion of the SBT, the candidate proceeds to LFUS. This LFUS requires a IRE/TRE qualified for SBT or ABT to occupy the other control seat and the candidate must complete a minimum of 4 sectors which include a minimum of 3 satisfactory take-offs and landings and 1 Pilot Monitoring (PM) sector.
6.
The first take-off and landing must be completed within 21 days of completion of the SBT. The remaining take-off and landing manoeuvres, as stated in paragraph 5 above, shall be completed within 3 months of the completion of the SBT.
7.
In the event of an unsatisfactory take-off or landing at any time during the LFUS, the candidate must immediately revert to PM duties only. On return to Base the said pilot shall fulfill, as a minimum, the following, or as additionally recommended by the Training Captain:
(a)
Either completes a minimum of 6 satisfactory take-offs and landings in a level D simulator approved for SBT, or a minimum of 3 satisfactory take-offs and 3 satisfactory landings in ABT. All the aforementioned take-offs and landings are to be under the supervision of a IRE/TRE qualified for ABT.
(b)
Completes the LFUS requirements as per paragraph 5 of this Appendix, except under the supervision of a IRE/TRE qualified for ABT, and the LFUS sectors shall be completed within 3 months of the completion of the SBT or ABT referred to in sub-paragraph (a) above.

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Chapter 5 - APPENDIX D

HELICOPTER PILOT’S NIGHT QUALIFICATION CHECK (NQC)

Cancelled – refers to CAD 360 Helicopter Supplement

CAD 360
Air Operator's Certificates
Part ONE
Operation of Aircraft
Chap 5/44
January 2009 (Amdt 26)

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CHAPTER 5 - APPENDIX E

Sample Form for Proficiency Check

AIRLINE
:
AIRCRAFT TYPE
:
CANDIDATE
NAME
:
SIMULATOR CODE /
AIRCRAFT REGISTRATION :
DATE
:
AUTHORISED EXAMINER :
PROFICIENCY CHECK NUMBER:
1
2
3
4
5
6
3 Year Rotation

ASSESSMENT

Satisfactory
(SAT)
Unsatisfactory
(UNSAT)
Retest
(SAT / UNSAT)

Instrument Rating

Pre-departure Checks / Use of Checklists:
Take Off / SID:
Enroute:
Hold:
ILS / MAP:

Aircraft Rating – LHS / RHS

LHS RHS
LHS RHS
V1 Cut:
ILS Approach (one engine inop):
MAP (one engine inop):
Land (one engine inop):
Note: When engine out manoeuvres are carried out in an aeroplane, the engine failure must be simulated.

Non Precision Approach / IAL:

LVO Procedures:

General

Automation Management:
Normal Procedures:
Non Normal Procedures:
PNF Duties:
TEM / CRM:

Items in accordance with CAD 360 Part One Chapter 5 Paragraph 9.3.5(b)

Remarks:

Submission Details

Management Confirmation

Examined By:
Confirmed
By:
I certify that ______________________________
____
has passed the Proficiency Check.
(1) Considering this and previous reports, I certify that
____
is competent to perform the duties of
Capt*/FO*/SO*.
Signed:
Signed:
ATPL No:
Rank / Post:
Date:
Date:
* Delete as appropriate

Notes:

(1)
For the initial PC this statement may also apply to Aircraft Base Training.
(2)
The above 'signature blocks' are also required for the company Annual Line Check Form.

CHAPTER 5 – APPENDIX F

REVALIDATION OF THE 3-MONTH TAKE OFF AND LANDING RECENCY

1.
If the pilot has not maintained **TAKE OFF and LANDING RECENCY for a period of SIX MONTHS OR LESS** then the said pilot's recency may be re-validated by completing the following:
(a)
Completes a minimum of THREE satisfactory take offs and a minimum of THREE satisfactory landings(1) in a Simulator(2) and (3), or a minimum of

THREE satisfactory take offs and a minimum of THREE satisfactory landings in ABT, either being within the period of THREE months which immediately precedes the commencement of the public transport flights.

(b)

The said pilot is accompanied by a Line Training Captain at the flying controls for the purpose of LFUS for the first take off and landing(1) and (5).

(c)

Completes a minimum of THREE take offs and a minimum of THREE landings in the aircraft(4) on Line Flying.

2.

If the pilot has not maintained **TAKE OFF and LANDING RECENCY for a period EXCEEDING 6 MONTHS BUT LESS THAN 12 MONTHS**, then the said pilot's recency may be re-validated by completing the following:

(a)

Minimum one familiarization session in a simulator.

(b)

One Recurrent Training (RT) simulator session.

(c)

PC.

(d)

Completes a minimum of SIX satisfactory take offs and a minimum of SIX satisfactory landings(1) in a simulator(2) and (3), or a minimum of THREE satisfactory take offs and a minimum of THREE satisfactory landings in ABT, either being within the period of THREE months which immediately precedes the commencement of the PTF and under the instruction of a Training Captain authorised to conduct SBT or ABT respectively.

(e)

The said pilot is accompanied by a Line Training Captain at the flying controls for the purpose of LFUS for a minimum of THREE take offs and a minimum of THREE landings(1), (4), (5) and (6).

3.

If a pilot has not maintained **TAKE OFF and LANDING RECENCY for a period of 12 MONTHS BUT LESS THAN 24 MONTHS**, then the said pilot's recency may be re-validated by completing the following:

(a)

Sufficient simulator sessions to ensure that the pilot has completed within his 3-year cycle the items as stated in **CAD** 360 Part One Chapter 5 paragraph 9.3.5(b).

(b)

Items indicated at paragraphs 2(a), (b), (c) and (d) above.

(c)

The said pilot is accompanied by a Training Captain, authorised to conduct SBT or ABT, at the flying controls for the purpose of LFUS for a minimum of THREE take offs and a minimum of THREE landings(1), (4), (5) and (6).

(d)

Sufficient Aircraft LFUS to complete the Annual Line Check.

4.

If a Pilot has not maintained **TAKE OFF and LANDING RECENCY for a period of 24 MONTHS OR MORE** then the pilot will be required to complete ABT in addition to the relevant items required by paragraph 3.

____

Notes: (1)
A satisfactory take off or satisfactory landing in the simulator or aircraft means the candidate was in full control at all times and without major prompting or physical input to the flying controls or thrust levers by the Training Captain.
(2)
Simulator means a ‘simulator so approved’.
(3)
The minimum specified take offs and landings in the simulator shall be completed in ‘real time’ between each take off and subsequent landing.
(4)
The three take offs and three manual landings in the aircraft are to be completed within THREE MONTHS of the completion of the simulator or ABT sessions.
(5)
One unsatisfactory take off or landing in the aircraft shall necessitate the termination of all further take offs and landings and the pilot concerned shall revert to PM duties only. On return to Base the said pilot shall complete as a minimum the requirements as outlined in paragraphs 2(d) and 3(c) above, or as additionally recommended by the Training Captain.
(6)
The LFUS shall consist of a minimum of 4 LFUS sectors to include the three take offs and three landings and one Pilot Monitoring (PM) sector.

CHAPTER 6 - EMERGENCY AND SURVIVAL TRAINING, PRACTICE AND TESTING REQUIREMENTS FOR FLIGHT CREW AND CABIN CREW

1 GENERAL REQUIREMENTS

1.1 Statutory Requirements

Statutory requirements relating to the training and periodical testing of crews are prescribed in the Air Navigation (Hong Kong) Order (AN(HK)O).
The primary purpose of this chapter is to indicate the nature of arrangements considered necessary to secure an adequate standard of compliance with the statutory provisions.
Requirements for cabin crew acting as members of the crew of business jet / general aviation flights are to be found in Appendix B of this chapter.

1.2 Crew Co-ordination and Combined Training

1.2.1 The successful containment of aircraft emergencies depends heavily upon effective co-ordination and two-way communication between flight crew and cabin crew.
1.2.2 Operators are expected to make every effort to provide combined training for flight crew and cabin crew. Much of the training that both must receive prior to operating public transport aircraft covers common ground; paragraphs 3 (Initial Training) and 4 (Aircraft Type Training) of this Chapter specify training that all crew members must be given.
1.2.3 Additional training that cabin crew must receive is listed in paragraphs 6 and 7. Flight crew should be made aware of such additional training as is provided to cabin crew in

compliance with this requirement.
1.2.4 Particular emphasis should be placed on the provision of joint practice in aircraft evacuations so that all who are involved learn of the duties other crew members must perform before, during and after the evacuation, thereby appreciating the necessity for effective two-way communications in such an emergency.
1.2.5 When combined training cannot be arranged, an operator's instructor should adopt the role of flight crew or cabin crew, as appropriate.
1.2.6 To facilitate training, it is essential that there is effective liaison between flight crew and cabin crew training departments; to promote consistency of drills and procedures, provision should be made for flight crew instructors to observe and comment on cabin crew training and vice versa.

1.3
Training Syllabus
A detailed emergency and survival training and testing syllabus is to be specified in the training manual. The syllabus should differentiate between initial training, aircraft type training, the annual emergency survival test and three yearly practice. The training programme shall be stated and approved by **CAD**.
1.4
Training Staff and Examiners
1.4.1 A suitably qualified person should be appointed to manage cabin safety training and testing; additionally instructors and examiners will need to be appointed to provide instruction, supervise practice and conduct tests. The practical training must be under the supervision of an instructor who has the knowledge, ability and experience to conduct such training. Details of all such appointments should be sent to the **CAD** not more than 14 days after the appointment becomes effective.
1.4.2 A training instructor should have a minimum of one year experience as a crew member or previous experience as safety training instructor. A training examiner should be an instructor who has an in-depth knowledge on the operator's training standards and requirements.
1.4.3 A person without the experience in as stipulated in 1.4.2 may still be considered for appointment provided adequate training and exposure to operational duties are given.
1.4.4 The training personnel conducting the instructor training must have current knowledge, ability and recent experience as an instructor and examiner. The appointment of these training personnel shall be subject to the approval of the Authority.
1.4.5 A safety Instructor / Examiner is required to:
(a)
be checked by a **CAD** inspector or an appointed operator's examiner every 36 months on their competency as instructor and/or examiner;
(b)
carry out a minimum of three observation flight sectors on the operator's flight within the last 36 months.
1.4.6 An operator is required to maintain the following records of their instructors and examiners:
(a)
training records;
(b)
training classes conducted;
(c)
examinations conducted;

(d)
observation flights;
(e)
checks as carried out by **CAD** inspector or an examiner appointed by **CAD**.
1.5
Training and Approved Instructors and Examiners
1.5.1 Training programme for cabin crew instructors and examiners should be submitted by operator to the Authority for approval. The application should include the qualifications, experience requirements, and the proposed training programme.

1.5.2 To conduct emergency procedures training, the cabin crew instructor and examiner needs to demonstrate a wide range of skills and knowledge to be able to train cabin crew and to be able to assess their competency regarding regulatory requirements and their airlines approved training course.
1.5.3 Additionally, an instructor and examiner may well be required to train crew in several different teaching environments, including classroom, evacuation trainer, swimming pool, door trainer and aircraft. This will require a high degree of subject knowledge, instructional skills, communication skills and people management skills to be demonstrated.
1.5.4 The competency of an instructor and examiner should ensure sufficient specific competencies that all cabin crew instructors and examiner should possess, regardless of the nature of their operations. This would include a complete assessment of the following:
(a)
Instructional Techniques – Classroom instruction and conducting of exams
(b)
Instructional Techniques – Practical exercises, demonstration and assessment
(c)
Subject knowledge
(d)
Leadership / People Skills
(e)
Course Administration
1.5.5 The conduct of crew training and of tests carried out by operators' instructor and examiner to be approved by **CAD** will be observed by appropriately qualified Inspectors to ascertain their competency.
1.5.6 An operator shall ensure that initial training (and refresher training at regular interval will be provided for each cabin crew instructor which includes at least the following:
(a)
Pedagogy course;
(b)
Cabin Crew Induction course; and
(c)
Cabin Crew Conversion and Annual Emergency Procedure Course.
1.6
Records of Training and Tests - Emergency and Survival
1.6.1 Records must be maintained to show trainees' progress through each stage of training and include information about the results of tests. Records should incorporate certificates indicating the competence of trainees to perform the duties on which they have been tested. Inspectors will advise operators on the form of records and

certificates,
1.6.2 Operators must keep records for all crew members to show when practices and tests are due for renewal. There should also be an effective system to guard against crews being rostered for duty when practices and tests are overdue. The annual emergency survival test is valid for 13 months.

1.6.3 Records of all initial, conversion and recurrent training and testing must be made available, on request, to the cabin crew member concerned.

1.7
Use and Approval of Aircraft Emergency Training Apparatus

1.7.1 Provision is made in the AN(HK)O for use of 'mock ups' for certain periodical tests. These devices must be individually approved for test purposes and may be used for such purposes only under the supervision of a person approved for that purpose. Approvals normally restrict the use of such devices to the particular operator's crews.

1.7.2 Details regarding the approval of training apparatus and the approval of personnel responsible for conducting the training and testing on this equipment are contained at paragraph 9 of this Chapter.

2
PURPOSE AND PROVISION OF TRAINING

2.1
Applicability

The requirements of this Chapter are applicable to all operating flight crew and cabin crew carried on board an aircraft.

2.2
Purpose

The purpose of emergency and survival training, practice and testing is to provide crews with the knowledge, skills and confidence needed to ensure that they deal efficiently with different types of emergency and survival situations.

2.3
Arrangements

Operators are to ensure that organised courses of instruction are given by designated instructors on the use of all emergency and survival equipment, and on all emergency procedures and drills, including aircraft emergency evacuation.

2.4
Cabin Crew - Service Duties

Cabin crew should also receive instruction in their normal flying duties, including the location and use of all cabin and galley equipment.

2.5
Training Aids

Suitable training aids will enhance the presentations in both classroom and practical instruction sessions.

2.6
First Aid Training

First aid training is to be given only by instructors qualified for the purpose. In case of doubt about the adequacy of an instructor's qualifications the **CAD** should be consulted. Training is to be followed by the successful completion of the appropriate first aid test.

2.7
Before Flying on Aircraft
Before flying training commences on an actual aircraft, flight crew are to complete successfully the training, practice and tests described in paragraphs 3 and 4 of this Chapter.

2.8
Supernumerary Flying
A later stage of aircraft type training will include cabin crew flying in a supernumerary role on a passenger flight. Passengers may not be able to distinguish between such trainees and fully trained cabin crew and in an emergency may expect to receive guidance and assistance from anyone wearing a crew uniform. Operators must therefore ensure that before undertaking supernumerary duties cabin crew have successfully completed the training and testing specified in paragraphs 3, 4, 6 and 7 of this Chapter.

2.9
Introduction of New Equipment
Operators are to ensure that they have an established procedure for all crew to receive training and practice on any new emergency and survival equipment that is introduced.

2.10 **Inspectors**
Inspectors may wish to observe the training, practice and tests in progress.

3
INITIAL TRAINING - ALL CREW

3.1
Introduction
Crew are to be trained in the following subjects which are of a general nature and not necessarily related to a specific aircraft type.

3.2
Crew Co-ordination
Emphasis is to be placed on the importance of effective co-ordination and two-way communication between flight crew and cabin crew in various emergency situations. Cabin crew should be trained to be alert, and to identify unusual situations that might occur inside the passenger compartment, as well as any activity outside the aircraft that could affect the safety of the aircraft or its occupants. The need for effective communication of accurate information between flight crew and cabin crew must be stressed.

3.3
Aeromedical and First Aid Topics
3.3.1 Instruction should be given on aeromedical topics such as:

(a)
first aid subjects appropriate to the aircraft type, ie its size and the number of flight crew carried;

(b)
guidance on the avoidance of food poisoning, with emphasis on the choice of a pre-flight meal and the importance of the commander and co-pilot eating

different food at different times during the flight, especially on long sectors;
(c)
the possible dangers associated with the contamination of the skin or eyes by aviation fuel and other fluids and their immediate treatment,
(d)
the recognition and treatment of hypoxia and hyperventilation; and
(e)
first aid associated with survival training, appropriate to the routes operated.
3.3.2 Flight crew who operate on aircraft where cabin crew are not carried should undertake training in basic first aid that is to include the use and contents of first aid kits, and in cardiopulmonary resuscitation.
3.4
Fire and Smoke Training
3.4.1 Practical fire and smoke training must be under the supervision of an instructor who has the knowledge, ability and experience to conduct such training. Operators who have difficulty in providing the necessary facilities in respect of fire training and testing can approach the Inspectorate for assistance .
3.4.2 Both theoretical and practical training should be given. This is to include:
(a)
an appreciation of the chemistry of fire as a preliminary to consideration of the choice of extinguishing agents for particular fire situations, the techniques of applying extinguishing agents, the consequences of misapplication and their use in a confined space;
(b)
a demonstration or film of fire extinguishers being used on various types of fires. Fires should be related to typical aircraft interior equipment and include galley fires, fire in toilets, upholstery, passenger service units and electrical installations.
3.5
Water Survival Training
3.5.1 Where flotation equipment is carried, a comprehensive wet drill to cover all ditching procedures must be practised by aircraft crew. This wet drill is to include, as appropriate, practice of the actual donning and inflation of a life-jacket, together with a demonstration or film of the inflation of life-rafts and/or slide-rafts. Crews must board the same (or similar) flotation equipment from the water whilst wearing a life-jacket. Training must include the use of all survival equipment carried on board flotation equipment and any additional survival equipment carried separately on board the aircraft.
3.5.2 Operators conducting intensive offshore helicopter operations will need to repeat wet drills every 2 years. Consideration should be given to the provision of further specialist training such as underwater escape training.
NOTE: Wet drill practice is always to be given in initial training, unless the crew member concerned has received similar training provided by another operator and such an arrangement is acceptable to the current employer.

3.6
Survival Training
Operators are to provide survival training, including the use of any survival equipment carried, appropriate to their areas of operation e.g. polar, desert, jungle or sea.
3.7

Human Factors
Training should address the physiological effects on the human body of flying, the problems associated with pressure change and hypoxia and the need for restrictions on underwater diving. Training should include information on flight time limitations, the effects of operating for extended periods of time and the effects of time zone changes. Operational limitations should include illness, use of alcohol and drugs, blood donations etc. Advice should be given on general health care, especially whilst operating overseas, and the need for preventative medicine such as immunisation, when operating to potentially infected areas.

3.8
Aerodrome Emergency Services
The operational procedures of ground-based emergency services at aerodromes should be discussed.

3.9
Aviation Security
Training is to be given in aspects of aviation security listed in Appendix A to this Chapter.

4
AIRCRAFT TYPE TRAINING - ALL CREW

4.1
General
Operators should ensure that comprehensive training is given on the location and use of all emergency and survival equipment to be carried on the aircraft, and that all training is related to the aircraft type, series and configuration to be operated. Aircraft type training must be given to all newly employed aircraft crew and to those who are converting to a new aircraft type.

4.2
Emergency and Survival Equipment
Training must be given in the location and use of all emergency and survival equipment together with the relevant drills and procedures. The following equipment must, if carried on board, be included:

(a)
emergency exits;
(b)
escape slides and, where non-self supporting slides are carried, the use of any associated ropes;
(c)
life-rafts and slide-rafts, including the equipment attached to and/or carried in the raft;

(d)
life-jackets, infant life-jackets and flotation cots;
(e)
drop-out oxygen and its manual deployment;
(f)
emergency and therapeutic oxygen;
(g)
protective breathing equipment and protective clothing;
(h)
fire extinguishers;

(i)
fire axes;
(j)
portable lights, including torches;
(k)
emergency lighting systems, including floor proximity lighting systems;
(l)
communications equipment, including megaphones;
(m) survival packs, including their contents;
(n)
pyrotechnics;
(o)
first aid kits and their contents;
(p)
toilet compartment smoke detector systems;
(q)
evacuation alarm systems; and
(r)
non-mandatory or special equipment fitted or carried.

4.3
Fire Training

Training must be given in extinguishing a fire, representative of an interior aircraft fire using the relevant type of fire extinguisher carried on the aircraft. Emphasis is to be placed on the characteristics of different types of extinguishers, including their effective range and duration and the effectiveness of their use on differing types of fires.

4.4
Protective Breathing Equipment and Protective Clothing

On aircraft types in which it is provided, crews must be trained in the use of protective breathing equipment and protective clothing. Donning and wearing of such equipment and clothing should be practised in an enclosed, simulated smoke-filled environment.

5
RECURRENT TRAINING - ALL CREW

5.1
Refresher Training

Operators must ensure that an annual organised course of refresher training is provided for their crews; this training should prepare them for the emergency survival test. Such training will have the additional advantage of allowing crews to discuss recent incidents, difficulties and emergencies which have been experienced. If none have arisen, operators should discuss possible scenarios with emphasis on what actions should be taken. Time must be allocated for this purpose. This discussion is particularly important when cabin crew are assigned to more than one type of aircraft. First aid and aviation security refresher training must also be included (see also Appendix A).

5.2
The Annual Emergency Survival Test

5.2.1 The AN(HK)O requires that all crew shall be tested on aspects of emergency and survival appropriate to the aircraft type to be operated. The maximum period of validity of this test is 13 months. Schedule 11 makes a distinction between tests and

practice, and operators should apply a similar distinction in their crew training records.
5.2.2 All crew must pass a test on their knowledge of the location and use of emergency survival equipment, and the appropriate drills and procedures. The test will be related to the aircraft type and cover every series and configuration. Appropriate written tests are required and must include first aid topics.
5.2.3 To demonstrate their proficiency in carrying out emergency duties, crew should practice - insofar as it is practicable and reasonable to do so - the actual movements and operations assigned to them in evacuation and other emergency drills. The donning of life-jackets, oxygen masks and protective breathing equipment and touch drills for opening emergency exits should be included

5.3
Periodic Practice

Once every 3 years aircraft crew are to carry out the following practice:

(a)
the operation and actual opening of all normal and emergency exits used for passenger evacuation;

(b)
extinguishing a fire, representative of an aircraft interior fire, with each type of fire extinguisher carried on board the aircraft except that, in the case of Halogen extinguishers, an alternative extinguishing agent may be used; and

(c)
the donning and use of protective breathing equipment by each crew member in an enclosed, simulated smoke-filled environment.

6
INITIAL TRAINING - ADDITIONAL ITEMS FOR CABIN CREW

6.1
General

Cabin crew are to be trained in the following subjects which are of a general nature and not necessarily related to a specific aircraft type.

6.2
Discipline and Responsibilities

Operators must ensure that during cabin crew initial training, the following items are included in the cabin crew training syllabus:

(a)
the importance of performing their duties in accordance with the operations manual;

(b)
maintaining competence and fitness to operate as a cabin crew member with special regard to flight and duty time limitations and rest requirements;

(c)
aviation regulations relating to cabin crew and the role of the **CAD**;

(d)
the effects on the aircraft's flight path resulting from a significant redistribution of passengers in flight;

(e)
basic aircraft icing, types of icing, the effects of icing on ground and in-flight operations and how to identify aircraft icing when viewed from the cabin;

(f)
pre-flight briefing of cabin crew and the provision of necessary safety

information with regard to their specific duties;
(g)
the importance of ensuring that relevant documents and manuals are kept up to date with amendments provided by the operator;
(h)
the importance of identifying when cabin crew members have the authority and responsibility to initiate an evacuation and other emergency procedures; and
(i)
the importance of safety duties and responsibilities, and the need to respond promptly and effectively to emergency situations.
6.3
First Aid
Instruction should be given on first aid and the use of first aid kits, together with the application of any drugs. The following subjects should be covered:
(a)
haemorrhage;
(b)
wounds;
(c)
fractures, including dislocation and sprains;

(d)
burns;
(e)
care of the unconscious;
(f)
shock;
(g)
heart attacks;
(h)
stroke, epilepsy, diabetes;
(i)
artificial respiration and cardiopulmonary resuscitation;
(j)
use of therapeutic oxygen and oxygen sets;
(k)
poisoning;
(l)
emergency childbirth;
(m) choking;
(n)
stress reactions and allergic reactions;
(o)
air sickness; and
(p)
asthma.
NOTE: In order to complete satisfactory practical training in artificial respiration and cardiopulmonary resuscitation, cabin crew must use a dummy specifically designed for the purpose.

6.4
Fire and Smoke Training
It is particularly important that cabin crew should be given theoretical and practical training in dealing with emergency situations involving fire and smoke in the cabin. The training is to include:

(a)
the responsibility of cabin crew to deal promptly with emergencies involving fire and smoke. Emphasis should be placed on the importance of identifying the actual source of the fire;

(b)
the importance of informing the flight crew immediately fire or smoke is discovered and of keeping them informed as the situation develops. The importance of crew co-ordination and communication is to be emphasised, together with an established procedure for communicating with the flight deck;

(c)
the importance of ensuring that passengers are aware of no smoking areas and obey no smoking signs. Emphasis is to be placed on the frequent and systematic checking of toilets (including smoke detectors) and other areas which are not part of the seating accommodation;

(d)
a demonstration or film is required of fire extinguishers being used on various types of fires. Fires are to be related to typical aircraft situations including fires in galleys, toilets, upholstery, passenger service units and electrical installations.

6.5
Abusive Passengers
Operators are to give advice to cabin crew on the management of passengers who become abusive; this often arises from excessive consumption of alcohol or the effects of medication/drugs, or a combination of both.

6.6
Seat Allocation
Cabin crew are to be given training on the importance of correct seat allocation with particular emphasis on the seating of disabled passengers and the necessity of seating able-bodied passengers adjacent to unsupervised exits.

6.7
Prohibited Items and Dangerous Goods (DG)
Cabin crew should be given training in aspects of the carriage of prohibited items and DG. DG training must comply with the requirements specified in the current edition of the ICAO Technical Instructions for the Safe Transport of Dangerous Goods by Air.

6.8
Flight Time Limitations
Cabin crew must be made familiar with the company flight time limitations scheme and the statutory requirements regarding crew fatigue.

6.9
Crew Resource Management (CRM) Training
6.9.1 Operators must provide initial and recurrent CRM training for all cabin crew. Cabin crew training should be combined, as far as practible, with flight crew training, to promote awareness of flight crew management of various emergency situations and the consequential effects on aircraft operation.

6.9.2 Combined training should include practice in aircraft evacuation and joint discussion of emergency scenarios. Wherever practible, SCCMs should participate in flight simulator Line Orientated Flying Training (LOFT) exercises.
6.9.3 Emphasis should be placed on the importance of effective co-ordination and two-way communication between flight and cabin crew in various abnormal and emergency situations. Emphasis should also be placed on co-ordination and communication within the crew in normal operational situations including the use of correct terminology, common language and effective use of communications equipment.
6.9.4 Cabin crew should be trained to identify unusual situations that might occur inside the passenger compartment, as well as any activity outside the aircraft that could affect the safety of the aircraft and/or passengers.
6.9.5 There should be effective liaison between flight and cabin crew training departments, and provision should be made for flight and cabin crew instructors to observe and comment on each others' training.

6.10 **Senior Cabin Crew Member (SCCM) Training**

Senior Cabin Crew Members should be given additional training on the following topics:

(a)
items to be covered at pre-flight briefing of the operating cabin crew including:
(i)
allocation of cabin crew stations and responsibilities;
(ii)
aircraft type and equipment fit;
(iii) area, route and type of operation e.g. ETOPS; and
(iv) any special category passengers such as infants, disabled or stretcher cases etc.
(b)
co-operation within the crew:
(i)
discipline, responsibilities and chain of command;
(ii)
importance of co-ordination and communication; and
(iii) action in the event of pilot incapacitation.
(c)
review of legal and operator's requirements:
(i)
passenger safety briefing , safety cards;
(ii)
securing of galleys;
(iii) stowage of Cabin baggage;
(iv) restrictions on use of portable electronic equipment;
(v)
procedure during turbulence;
(vi) procedures when fueling with passengers on board; and
(vii) documentation.
(d)
Human Factors and Crew Resource Management, including participation in flight simulator LOFT exercises if practicable;

(e)
accident and incident reporting; and
(f)
flight and duty times limitations and rest requirements.

7
AIRCRAFT TYPE TRAINING - ADDITIONAL ITEMS FOR CABIN CREW

7.1
Practical training

7.1.1 The following is the minimum level of training necessary to satisfy the relevant requirements for cabin crew aircraft type training:

(a)
during ditching and evacuation drills, each trainee operates and actually opens all normal and emergency exits; removes and positions for use at least one escape rope; attaches escape slide fittings in their proper places; descends an escape slide from a height representative of the aircraft main deck sill height (not required for subsequent type training unless sill height is significantly higher); locates and operates the megaphone; and removes life-rafts from stowages and positions in the launching area. Additionally, the trainee must demonstrate the ability to locate and remove from stowage the aircraft first aid kits and hand fire extinguishers;
(b)
each trainee observes a practical demonstration of an escape rope being used as a means of emergency evacuation; the inflation or release, as applicable, of an escape slide; inflation of a life-raft; the survival equipment contained in the life-raft; the contents of the first aid kits; administering supplemental crew and passenger oxygen by portable equipment;
(c)
each trainee observes demonstrations of the use of the type of fire extinguishers carried on the aircraft on various types of fire including simulated galley, electrical and cabin furnishing fires. The demonstration should also show the effect of misapplication of agents;
(d)
each trainee handles and uses each type of fire extinguisher carried on the aircraft;
(e)
each trainee observes the inflation of an infant flotation cot;
(f)
each trainee practices the donning of oxygen masks carried in the aircraft; and
(g)
each trainee is familiarised with the use of the aircraft PA and interphone system.

7.2
Evacuation Procedures and Emergency Situations

7.2.1 Emergency evacuation training is to include the recognition of particular types of emergency situations. Cabin crew will also need to recognise when exits are unusable or when evacuation equipment is unserviceable and to act accordingly to overcome these problems. Circumstances might arise, such as the incapacitation of the flight crew, where these drills might need to be initiated by cabin crew.

7.2.2 Cabin crew are to be trained to deal with the following specific emergency situations:

(a)
an unpremeditated emergency on take-off or landing, including a ditching;

(b)
a pre-warned emergency landing or ditching;
(c)
an in-flight fire, with particular emphasis on establishing the fire source;
(d)
sudden decompression, including the donning of portable oxygen equipment; and
(e)
severe turbulence.

7.3
Crowd Control

7.3.1 Operators are to provide comprehensive training in the practical application of all aspects of crowd control in various emergency evacuation situations. Training is to emphasise the need for cabin crew to be assertive and, at times, aggressive during an emergency evacuation. Scenarios must be as realistic as possible and should include, as a minimum:

(a)
communications between flight crew and cabin crew and use of all communications equipment, including the difficulties of co-ordination in a smoke-filled environment;
(b)
verbal commands;
(c)
the physical contact that may be needed to encourage people out of an exit and on to a slide;
(d)
the re-direction of passengers away from unusable exits;
(e)
the marshalling of passengers away from an aircraft;
(f)
the evacuation of disabled passengers; and
(g)
authority and leadership.

7.3.2 The executive order to initiate an emergency evacuation is to be given by the Senior Cabin Staff Member in English ('Evacuate, Evacuate') and in Cantonese ('Saw Sarn, Saw Sarn'). Other cabin attendants should repeat the order in their native language where passenger demography so requires.

7.4
Pilot Incapacitation

Where the flight crew consists of only 2 pilots, cabin crew are to be given training in recognising the signs of subtle incapacitation and practice the ways in which they can be of help in the event of pilot incapacitation. This should include:

(a)
use of the pilot's oxygen equipment;
(b)
familiarity with the location and method of use of pilot check lists;

(c)
fastening and unfastening pilots' seat harness and, in the case of inertia reel harness, locking and unlocking the inertia device; and
(d)
using pilots' sliding seat mechanism; training is to be given with the seat occupant simulating physical collapse. Emphasis is to be placed on 'locking' the pilot in his seat rather than on removing him from the seat, which may not in the event be possible.

7.5
Passenger Briefings

7.5.1 Training and practice is to be given in the pre-flight briefing of passengers in normal and emergency situations, including emergency landings, ditching and turbulence. Training is also to include the in-flight briefing for the pre-warned emergency landing and ditching, demonstrating the brace position and the briefing of able-bodied passengers on how to operate exits.

7.5.2 Briefings are to be given in English and Chinese (the language of Chinese can be either Cantonese or Mandarin, as justified by the operator and with the concurrence from **CAD**) and may include another language where passenger demography so requires. Where audio-video presentation is utilised, the audio text is to be in English and Chinese (promulgated as aforesaid) with each text accompanied by synchronised Chinese (traditional) characters and English sub-titles respectively.

7.6
Cabin Baggage and Cabin Clutter

Cabin crew are to be instructed that cabin baggage, service items and other objects are only to be stowed in approved areas such that they are restrained against forward, lateral and vertical movement. They must not be stowed in such a way as to obstruct or damage emergency equipment or exits. Training is to include the areas of the cabin that are approved for the stowage of cabin baggage or other items and the areas where it would be unsafe to do so.

7.7
Brace Positions

Training and practice is to be given in the correct brace positions for both cabin crew and passengers. Such training must take into account different seating configurations and orientation.

7.8
Supernumerary Sectors

On completion of emergency and survival training and prior to operating as a required crew member, cabin crew must operate a minimum number of supernumerary or "under supervision" sectors on each aircraft type. The minimum number must be agreed with the **CAD**. The supernumerary cabin attendant is required to be in addition to the normal crew complement.

8
RECURRENT TRAINING - ADDITIONAL ITEMS FOR CABIN CREW

8.1
The Annual Emergency Survival Test
Cabin crew should show a satisfactory knowledge of crowd control techniques, if applicable, and of their role in the event of pilot incapacitation. Cabin crew should also undertake first aid refresher training and pass an appropriate written test.
8.2
Periodic Practice
Cabin crew are to carry out the following practice once every three years:
(a)
pilot incapacitation drills, as specified at paragraph 7.4 of this Chapter; and
(b)
practical training in artificial respiration and cardiopulmonary resuscitation using a dummy specifically designed for the purpose.
9
APPROVAL OF AIRCRAFT EMERGENCY TRAINING APPARATUS AND OF PERSONNEL CONDUCTING TRAINING AND TESTING WITH SUCH APPARATUS
9.1
Operators may wish to conduct some of their emergency training and testing on training apparatus rather than on an actual aircraft, in accordance with Schedule 11, Part B 1. (1)(b) of the AN(HK)O. Where this is the case, the apparatus and the persons controlling the apparatus must be formally approved by the **CAD**.
9.2
Operators wishing to obtain approval for their apparatus and personnel should apply to the Flight Operations Inspectorate through their assigned Inspector to arrange an inspection. Upon satisfactory conclusion of the inspection, an approval will be issued. Renewal of the approval will be by similar inspection.
9.3
If it is proposed to use the apparatus for all practical emergency survival training and testing, it will need to meet all the items in paragraph 9.4. However, approval may be sought and given for limited use of apparatus, in which case only the relevant items need be met.
9.4
Subject to the proviso in paragraph 9.3, the apparatus should accurately represent the aircraft in the following particulars:
(a)
layout of the cabin in relation to exits, emergency exits, galley areas and safety equipment stowage; dimensions should be an accurate representation typical of aircraft in the fleet;

(b)
both cabin attendant and passenger seat positioning - with particular accuracy where these are immediately adjacent to exits;
(c)
seat dimensions and seat pitch;
(d)
operation of exits and emergency exits in all modes of operation particularly in relation to method of operation and weight and balance;
(e)
extent of movement and associated forces of all controls for all equipment and

services;
(f)
provision of emergency equipment of the type provided in the aircraft;
(g)
all cabin markings;
(h)
all cabin lighting;
(i)
cabin attendant communications equipment and associated control panels;
(j)
evacuation slides, including normal and standby methods of operation; and
(k)
height and angle of inflated evacuation slides.
9.5
Operators should nominate training personnel to be approved by the **CAD** for the control of training apparatus. Operators must satisfy themselves that nominated personnel have the qualifications and experience to conduct such training and that they have undergone a period of training which the assigned Inspector may wish to observe. All approved training personnel should be so nominated in the company training manual.
9.6
An operator may arrange to use the apparatus and/or personnel of another operator. A separate approval will be required in such cases. The training given must comply with the training manual and operating procedures of the operator whose crews are being trained and items covered in the apparatus may be restricted, if significant differences of cabin layout and equipment exist.

CHAPTER 6 APPENDIX A - AVIATION SECURITY TRAINING PROGRAMME - ALL CREW
1.
Training Programmes
1.1
Operators of Hong Kong registered aeroplanes shall establish and maintain an approved security training programme which ensures crew members act in the most appropriate manner to minimize the consequences of acts of unlawful interference. As a minimum, this programme shall include the following elements:
a)
determination of the seriousness of any occurrence;
b)
crew communication and coordination;
c)
appropriate self-defense responses;
d)
understanding of behaviour of terrorists so as to facilitate the ability of crew members to cope with hijacker behaviour and passenger responses;
e)
live situational training exercises regarding various threat conditions;
f)
flight deck procedures to protect the aeroplane;
g)

aeroplane search procedures and guidance on least-risk bomb locations where practicable; and

h)

post-incident concerns for crew.

1.2

Operators conducting helicopter operations shall establish and maintain a training programme to acquaint appropriate employees with preventive measures and techniques in relation to passengers, baggage, cargo, mail, equipment, stores and supplies intended for carriage on a helicopter so that they contribute to the prevention of acts of sabotage or other forms of unlawful interference.

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CHAPTER 6 – APPENDIX B – BUSINESS JET / GENERAL AVIATION – CABIN CREW TRAINING

1 GENERAL

1.1

Under current legislation, aircraft registered in Hong Kong having 35 seats or less and carrying less than 20 passengers, flying for the purpose of public transport, are not required to have on board cabin crew for the purposes of performing duties in the interests of the safety of passengers. However, it is **CAD** policy that where cabin crew are boarded as members of the crew of such aircraft, operators are to ensure that these cabin crew receive training, both initial and recurrent, in the use of safety and medical equipment specific to their aircraft.

1.2

Crew Co-ordination

As with aircraft carrying a greater number of passengers/seats, business jets and those of a similar category depend heavily upon well-integrated communication between the whole crew to effectively contain an aircraft emergency. Cabin crew are to be aware of the role that they can play in the bringing such an event to a successful conclusion. Aircraft safety training sessions should include, where possible, the whole crew.

1.3

Health and Safety

The dangers inherent in many training situations should be well recognised by training staff and should be taken into account in the formulation and execution of training.

1.4

Training Syllabus

A syllabus which covers familiarity with, and the use of, the equipment to be found on board the specific aircraft, along with those topics generally applicable to an aviation environment, should be specified in the appropriate manual. The syllabus should cover induction and new-to-type training, as well as annual recurrent training.

1.5
Training Staff
Appropriately qualified staff should be chosen to act as training facilitators. Each should be a qualified crewmember on the aircraft type upon which they are instructing. On appointment a **CAD** inspector will observe a training session in order to approve that appointment.
1.6
Records of Training and Tests
Records of all training and tests for each individual crewmember must be maintained and available for periodic inspection by **CAD** staff. Initial and new-to-aircraft training must be successfully completed prior to the first flight for the purpose of public transport in the aircraft. Recurrent training should be undertaken within 13 months of the previous qualification.

1.7
Use of Training Aids
The impracticability for companies in this category to provide aircraft-type 'mock-ups' is acknowledged by the **CAD**. Recognised aids which adequately fulfil the training requirement, would be acceptable to the **CAD**. This could include, but not be limited to, video and multimedia presentations and instructor briefing. Companies are encouraged, however, to utilise a dedicated training department where possible.
2
PURPOSE AND PROVISION OF TRAINING
2.1
Purpose
The purpose of emergency and survival training, practice and testing is to provide crews with the knowledge, experience and confidence to deal effectively with emergency and survival situations that could possibly be encountered.
2.2
First Aid Training
First aid training is to be given only by instructors qualified for the purpose.
3
INITIAL TRAINING – ALL CREW
3.1
Introduction
Crews should be acquainted with those physiological conditions which could possibly be encountered in the course of a flight. In addition, they should be experienced in use of the safety equipment to be found on their aircraft and the uses and limitations of such equipment.
3.2
Aeromedical and First Aid Topics
Cabin crew should have an awareness of basic aeromedical situations, including such aspects as the symptoms and treatment of hypoxia, hyperventilation, cardiac arrest, etc. In addition, they should have training in simple first aid techniques. Practical training, including the use and the limitations of both portable and fixed oxygen systems in the aircraft must be experienced, as well as familiarity with the contents and use of the aircraft first aid kit.
3.3
Fire Fighting Training
Recognition of the type of fire, choice and use of fire fighting equipment should be

taught, including the inappropriate nature of certain types of fire extinguisher with certain types of fire, in addition to the knowledge of the isolation of equipment in the case of an electrical fire. The absolute need for continual liaison with cockpit crew in the situation of a cabin fire must be emphasised.

3.4
Aircraft Evacuation and Survival Equipment
Cabin crew must be conversant with the means by which passengers may be evacuated from the aircraft, both via emergency exits and through aircraft entry doors, and with all equipment related to evacuation. Where possible, removal of emergency exits should be experienced on initial training. Where liferafts are carried as permanent aircraft equipment, cabin crew should have instruction upon from where, and how, they are launched and the purposes and use of the safety equipment carried on board the rafts.

3.5
Pilot Incapacitation
Training in the identification of pilot incapacitation and the actions to be taken in such a situation must be given. This should include use of related equipment in the cockpit and the ability to secure the incapacitated pilot and the function of the pilot's seat controls. Practice in reading the cockpit checklist and its facilitation should be given.

4
RECURRENT TRAINING

4.1
All flight crew, including cabin crew, should undergo Aircraft Emergency Procedures training (AEP) on a recurrent basis. This should be done at not more than 13 month intervals and, as in the case of initial and new-to-type training, culminate in an examination. Records of such training and the results of examinations should be kept for the perusal of the **CAD**.

4.2
Activities such as the opening and removal of an emergency exit and the hands-on use of fire extinguishers should be carried out every three years.

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CHAPTER 7 - CABIN SAFETY
1
CABIN CREW
1.1
Age/Medical Requirements
1.1.1 A cabin crew member should be at least 18 years of age and have passed an initial medical examination or assessment and been found medically fit to discharge the duties specified in the operations manual. An operator must ensure that cabin crew members remain medically fit to discharge such duties.
1.1.2 The initial medical examination or assessment, and any re-assessment, of cabin crew members should be conducted by a medical practitioner registered in Hong Kong. However, when necessary, the final authority rests with a Hong Kong AMA.
1.1.3 The following medical requirements are applicable to cabin crew members:
(a)
good general health;
(b)
freedom from any physical or mental illness which might lead to incapacitation or inability to perform cabin crew duties;
(c)
normal cardiorespiratory function;
(d)
normal central nervous system;
(e)
adequate visual acuity - 6/9 with or without glasses;
(f)
adequate hearing; and
(g)
normal function of ear nose and throat.
1.2
Senior Cabin Crew members
1.2.1 Whenever more than one cabin crew member is carried on a flight, the operator must nominate a senior cabin crew member. The senior cabin crew member will be responsible to the commander for the conduct and co-ordination of the cabin safety and emergency procedures specified in the operations manual.
1.2.2 An operator shall not appoint a person to the post of senior cabin crew member unless that person has at least one year's experience as an operating cabin crew member and has completed an appropriate course of training.
1.2.3 An operator shall establish procedures to select the next most suitably qualified cabin crew member to operate as senior cabin crew member in the event of the nominated senior cabin crew member becoming unable to operate. Such procedures must be acceptable to the **CAD** and take into account the cabin crew member's operational experience.

1.3
Cabin Crew Complement
1.3.1 It is incumbent on operators to ensure that passenger-carrying public transport aircraft do not fly with lesser numbers of cabin crew than the law prescribes. Furthermore, minimum numbers specified in operations manuals should take full account of all the factors detailed below.
1.3.2 Required Complement

The complement specified will be that calculated in accordance with Article 18(7)(c) of the Air Navigation (Hong Kong) Order 1995, or for wide bodied aircraft one Cabin Crew member per door that is designated an Emergency Exit, whichever is the higher. In exceptional circumstances the complement may be reduced and will become that specified in a Permission granted in accordance with the provision to Article 18(7).

1.3.3 Minimum Complement

The minimum complement specified in the operations manual will be not less than the required complement but may be greater. Factors that should be taken into account when calculating the minimum complement will include:

(a)
the number of exits;

(b)
the type of exits and their associated slides;

(c)
the location of exits in relation to cabin crew seats and cabin layout;

(d)
the location of cabin crew seats taking into account cabin crew duties in an emergency evacuation including:

(i)
opening floor level exits and initiating stair or slide deployment;

(ii)
assisting passengers to pass through exits; and

(iii) directing passengers away from inoperative exits, crowd control and passenger flow management.

(e)
actions required to be performed by cabin crew in ditching emergencies, including the deployment of slide-rafts and the launching of life-rafts; and

(f)
the number of crew who actively participated in the cabin during the emergency evacuation demonstration for aircraft certification.

NOTE: Having regard to all the considerations listed above, the minimum acceptable complement of cabin crew will, in most circumstances, be not less than one cabin crew to serve every floor level exit. This number might not always be appropriate, for example, where the position of floor level exits in a cabin is such that it enhances the importance of non floor level exits e.g. overwing exits, when consideration should be given to seating cabin crew adjacent to the latter. Also, this number could even be excessive; for example when, as on some narrow-body aircraft, two floor level exits are very close together it is reasonable to expect one cabin crew to open both exits and initiate stair or slide deployment in turn before assisting evacuation from both simultaneously.

1.3.4 Normal Complement

The normal complement will be not less than the required complement and may be greater than the minimum complement. Its use would be to guide rostering staff to crew the cabin to a level required to provide a service to passengers that could not be achieved with lesser numbers.

1.3.5 When scheduling cabin crew for flights, rostering procedures should take account of the experience of each cabin crew member such that the required cabin crew includes some cabin crew members who have at least three months operating experience as a cabin crew member.

1.3.6 If operators should seek alternative solutions, it will be for them to satisfy the **CAD** that such lesser numbers of cabin crew as they wish to specify are so positioned throughout the aircraft and have such drills specified that they can reasonably be expected to manage any cabin emergency that might arise. In circumstances such as these, operators should pay particular attention to ensuring that cabin crew who have least experience of working in the aircraft or with the operator are paired with those who are well experienced.

1.4

Operation on more than One Type or Variant

1.4.1 Cabin crew may not normally operate on more than three aircraft types except that, with the agreement of the **CAD**, they may operate on four types provided that safety equipment and emergency procedures for at least two of the types are similar.

1.4.2 For the purposes of paragraph 1.4.1, variants of a particular aircraft type are considered to be different types if they are not similar in all of the following aspects:

(a)
emergency exit operation;

(b)
location and type of safety equipment; and

(c)
emergency procedures.

1.5

Recency

1.5.1 An operator shall ensure that any cabin crew member who has been absent from all flying duties for more than six months completes refresher training as specified in the operations manual. The training shall include at least the requirements listed in paragraph 1.6.

1.5.2 An operator shall ensure that any cabin crew member who has not, during the preceding six months, operated on a type or variant, before undertaking duties on that type either:

(a)
completes refresher training on the type; or

(b)
operates two sectors under supervision.

1.6

Training

An operator shall ensure that initial training (and refresher training at regular intervals) will be provided for each cabin crew member which includes at least the following;

(a)
emergency procedures including pilot incapacitation;

(b)
evacuation procedures including crowd control techniques;

(c)
the operation and actual opening of all normal and emergency exits for passenger evacuation in an aircraft or approved training device;

(d)
demonstration of the operation of all other exits; and

(e)
the location and handling of emergency and life-saving equipment, including oxygen systems, portable oxygen, protective breathing equipment, the donning

of life-jackets, the use of first aid and, if carried onboard, universal precaution kit in case of suspected communicable disease.

NOTE: Guidance on the types, number, location and contents of the medical supplies (including first-aid kits, and/or universal precaution kits, and medical kit when required) is given in Annex 6 Part I Chapter 6 Attachment B.

1.7

Uniforms

1.7.1 Operators should provide crew uniforms which readily distinguish the wearer as a member of the cabin staff. Uniforms should, whenever practicable, be manufactured from non-thermoplastic material, such as wool; particular attention should be paid to uniform linings and melt factors.

1.7.2 Protective clothing for at least two crew members, such as a quick donning jump suit manufactured from a non-thermoplastic material, should be provided for aircraft being operated in a combined passenger and cargo role, i.e., Class 'B' compartments.

1.7.3 Care should be exercised in the provision of cabin crew's footwear. Appropriate shoes should be worn during take-off and landing, to cater for possible emergency situations etc., so as to avoid damage to slides.

1.7.4 All chains worn around the neck and unconcealed by clothing have the potential to snag and so hamper movement. At worst they can be a cause of injury to the wearer. Both the restriction of movement and the risk of injury that may occur when neck chains are worn have the potential to inhibit crews from carrying out their duties. Operators must therefore instruct crews to remove unconcealed neck chains when on board aircraft. If there is a requirement that ID cards must be displayed, other forms of attachment must be used, care being taken to ensure that this does not result in loose chains continuing to present a risk of snagging.

2

CABIN SAFETY MANAGEMENT

2.1

Pre-departure Procedures

2.1.1 Operators should establish check-in and boarding gate procedures and, where applicable, training for their traffic staff and handling agents. Emphasis should be placed on the need for these personnel to identify and resolve potential difficulties in seat allocation (see also paragraphs 2.2 and 2.3), excess cabin baggage, the carriage of dangerous goods, drunken or unruly passengers, including boarding refusal, before passenger embarkation begins. This is of particular importance at overseas departure points.

2.1.2 Similar instructions and training should also be given to cabin crew to deal with problems which may have been missed at check-in.

2.2

Seat Allocation

2.2.1 The following types of passengers should not be seated where they could obstruct emergency exits, impede the crew in their duties, obstruct access to emergency equipment or hinder aircraft evacuation:

(a)
handicapped people, including the blind and deaf. Only one such passenger should be allocated to each floor level exit;

(b)
persons who are elderly or frail;

(c)
children and infants, whether accompanied or not;
(d)
deportees or prisoners in custody; and
(e)
obese passengers.
2.2.2 Handicapped passengers should be seated as close to emergency exits as the above limitations allow. Operators should refer to FON 04/2008 for detailed guidance on the handling of passengers with disabilities.
2.3
Seat Allocation at Self-help (Types III and IV) Exits
2.3.1 Seats which form the access route from the cabin aisle to these exits should only be allocated to passengers who appear capable of operating and/or assisting with the operation of the exit; check-in staff should identify likely candidates for these seats.

2.3.2 On no account should the types of passengers, listed in paragraph 2.2.1 be allocated seats which form the access route from the cabin aisle to these types of exit. Preference should be given, where possible, to seating non operating crew at these locations.
2.4
Drunken Passengers
2.4.1 Article 49 of the AN(HK)O states that "A person shall not enter any aircraft when drunk or be drunk in any aircraft".
2.4.2 Operators are to provide instructions, advice and training to all relevant staff on dealing with passengers who have been drinking excessively. Such advice should include when to deny boarding rights and reiterate the commander's prerogative to exercise the powers, as conferred by the AN(HK)O, to protect the safety of the aircraft and passengers.
2.4.3 Drunken passengers constitute not only a possible source of annoyance to fellow passengers but also a hazard to flight safety. Potentially hazardous incidents should be reported through the MOR scheme.
2.5
Stowage of Cabin Baggage
2.5.1 Cabin baggage may only be stowed in approved locations. Operators should provide clear and unequivocal advice on which areas are approved.
2.5.2 Overhead lockers and other stowages must be clearly placarded with weight limitations and enclosed by latched doors or load bearing nets as appropriate; cabin crew must be made aware of the need to ensure that limitations are not exceeded.
2.5.3 Underseat stowages may only be used if the seat is equipped with a restraint bar and the baggage is of a size to fit under the seat.
2.5.4 Baggage must not be stowed in toilets, immediately forward or aft of bulkheads, or in such a manner that it will impede access to emergency equipment. Particular attention must be paid to maintaining the integrity of all evacuation routes.
2.6
Stowage of Catering Supplies and Crew Effects
2.6.1 All catering supplies, blankets, pillows, newspapers etc. are to be securely stowed in approved areas for take-off and landing.
2.6.2 Similarly, crew effects, including baggage and clothing, must be stowed in approved areas. Particular care must be taken to ensure that doors and exits, including operating handles, are not obstructed nor ready access to emergency equipment precluded.
2.7

Carriage of Aerosols

2.7.1 Advice and instructions should be provided to crew on the carriage of aerosols. In particular, the potential fire hazard posed, and how this may be obviated by careful stowage should be emphasised.

2.7.2 Unless it is unavoidable, aerosols should not be used for dispensing air fresheners, insecticides or other similar agents.

2.8

Portable Electronic Equipment

The **CAD** has considered evidence that navigation equipment may malfunction as a result of interference from passengers' portable electronic equipment. At the request of the commander, cabin crew may be required to check the cabin for portable electronic equipment being used by passengers.

2.9

Spillage of Drinks

There is an obvious potential for a major incident to occur when such items as conductive liquids in open containers, cutlery etc are mishandled on aircraft flight decks. All operators are requested to review their procedures for handling drinks and other items in and around the flight deck, as appropriate. Clear advice should be given to all crew on how best to route drinks when passing them about, so as to avoid any risk of accidental spillage on to electrical equipment

2.10 **Security of Flight Crew Compartment**

2.10.1 Operational procedures must be in place to prevent unauthorized persons from entering the flight crew compartment. Particular attention must be paid to entering and exit procedures, monitoring of door area, and procedures for crew leaving the flight crew compartment.

2.10.2 Operators shall also establish a policy and procedures with regard to cabin crew notification to flight crew in the event of suspicious activity or security breaches in the cabin.

2.10.3 FON 04/2002 remains current and shall be referred to by operators.

3

SAFETY BRIEFING

3.1

Passenger Briefing

3.1.1 Passengers are to be given a pre-departure briefing, without distraction by other cabin activities. The briefing should cover all relevant points appropriate to the aircraft type and operation being undertaken. The following points must be pointed out by demonstration or video:

(a) seat belt operation;

(b) location of emergency exits, including any unserviceabilities;

(c) life-jacket operation, where required; and

(d) operation of drop-out oxygen, where required.

Passengers' attention must be drawn to smoking restrictions; when appropriate, the availability of infant life-jackets and flotation cots; the need for children's and babies oxygen masks to be fitted after those of their accompanying elders; and advice on wearing seat belts at all times.

3.1.2 The location of floor lighting systems must be included in the briefing and, where possible, the system should be activated for a few seconds.
3.1.3 Passengers' attention should be drawn to the safety card and mention made of the instructions for operating types III and IV exits, if appropriate.
3.1.4 Attention should also be drawn to restrictions on the use of personal electronic equipment, including mobile telephones; this is to be repeated prior to landing.
3.1.5 here briefings are given by the use of a video presentation, cabin crew must monitor screens to ensure that each passenger receives a full briefing and, particularly with larger aircraft, physically indicate the nearest available exit. Where passengers have not, or cannot (because of location), received a full briefing by video, individual briefings must be given.
3.1.6 Operators should ensure that their crew drills include a procedure for passengers to be warned of impact so that they can adopt the brace position at the appropriate time before impact.

3.2
Passenger Safety Cards

3.2.1 The passenger safety briefing must be supplemented with a pictorial safety notice relevant to the type of aircraft and its safety equipment (passenger safety card). Information contained in the card must be consistent with the briefing. A copy of each card currently in use must be lodged with the Flight Operations Inspectorate.
3.2.2 The card is to be designed and produced as an entity separate from any other literature. It should be located so that the seated passenger can readily see and identify it; a distinctive message that it contains safety information should be placed at the top of the card.
3.2.3 Equipment and operating methods should be depicted pictorially, using internationally recognised symbols wherever possible. Any wording, which should be kept to a minimum, is to be in English with equivalent Chinese characters.
3.2.4 Passenger safety cards must provide the following information:

(a)
seat belts - instructions for fastening, adjusting and unfastening;
(b)
exit location - routes to exits should be indicated;
(c)
exit operation - for all types of exit fitted. Illustrations should depict a person operating the exit with the direction of the movement of handles clearly indicated;
(d)
use of evacuation slides - depicting the correct method of use, the manual inflation handle and discarding high heeled shoes;
(e)
brace positions - for all types of seat orientation and pitch in use on the aircraft;
(f)
oxygen masks - instructions on locating, donning and adjusting the mask; initiating oxygen flow. Instructions should be given that masks should be fitted to children only after their guardians have fitted their own;

(g) life-jackets - removal from stowage, removed from container and inflation. The card must show that, excepting children, the life-jacket must not be inflated within the cabin; and

(h) life-rafts - location, removal, preparation for use. inflation and launching. Launching locations should be indicated.

Additionally, operators may wish to include the following:

(i) Smoking - restrictions;

(j) Seatbacks and trays - upright and stowed for take-off and landing; and

(k) Emergency floor path lighting systems.

4 CABIN CREW DUTIES

4.1 Pre-flight Briefings

Cabin crew should be given a safety briefing prior to the commencement of any flight and, in a series of consecutive flights, after each full rest period. Consideration should be given to the following:

(a) areas dedicated to pre-flight briefing usage that afford privacy should be provided;

(b) copies of the relevant cabin safety manual and current safety notices must be available;

(c) all cabin crew present should be required to answer satisfactorily at least one question on aircraft safety (emergency drills, safety equipment location and usage) or one on first aid;

(d) the allocation of cabin crew to specific seats in the passenger compartment, where applicable, should take due account of the need to ensure that no area is devoid of persons who have experience in the conduct of safety-related duties;

(e) safety ‘reminders’ that address any recent changes to safety-related issues or any perennial problems should be given; and

(f) action to be taken by the Senior Cabin Crew Member (SCCM), if it becomes apparent that any crewmember displays inadequate knowledge of safety-related issues.

4.2 Allocation of Cabin Crew Stations

4.2.1 General

Arrangements should be made, preferably during rostering, to ensure an even spread of experienced cabin crew through the aircraft. SCCMs should allocate duties and positions on the day with this in mind. The SCCM must occupy an approved crew seat for all take-offs and landings.

4.2.2 Senior Cabin Crew Member Seating
When the assigned crew station of the SCCM does not allow immediate access to the flight deck, operators must specify drills which reflect the following:
(a)
the cabin crew seated closest to the flight deck should be responsible for communicating with the flight deck crew in the event of any emergency on take-off or landing; and
(b)
emergency evacuation procedures should require the SCCM to remain at his or her station and to control and operate the emergency exits.
4.3
Embarkation and Disembarkation of passengers
Instructions should be available to crews for marshalling of passengers at stations where ground handling staff are unavailable.
4.4
Arming and Disarming Slides
Slides should be armed as soon as obstructions to their deployment (steps, jetties etc) are removed and clear. Slides should remain armed after landing until arrival 'on stand'. Crews should be aware of the dangers of accidental deployment.
4.5
Duties Prior to Take-off and Landing
4.5.1 Cabin crew carried in accordance with AN(HK)O requirements should remain at their stations with harnesses fastened, except when performing duties related to the safety of the aircraft and its passengers.
4.5.2 All catering and other equipment is to be stowed prior to take-off.
4.5.3 All items of galley electrical equipment should be switched off.
4.5.4 Operators must ensure that at any time the aircraft is on the ground, provision for the safe and rapid evacuation of passengers in an emergency is maintained.
4.6
Cabin Lights for Take-off and Landing
The dimming of interior cabin lights, particularly when taking-off and landing at night, is recommended.
4.7
Refuelling Operations with Passengers on Board
When operators wish to refuel aircraft with passengers on board, instructions should be issued to crews. Instructions should cover at least the following points:
(a)
aircraft steps and jetties, and cabin crew positions;
(b)
smoking prohibition;

(c)
restriction on use of electrical equipment and switch gear; and
(d)
slide arming and clearance area.

Operators should discuss such proposals with their assigned Inspectors.

4.8

Flight Crew and Cabin Crew Liaison

4.8.1 Operators' instructions should be clear on the need for good liaison to exist between flight crew and cabin crew.

4.8.2 A means must be established for the conduct of liaison. Such liaison should extend until after the aircraft has arrived at its final destination where, for instance, cabin safety equipment defects may need to be attended to.

5

SAFETY, EMERGENCY AND SURVIVAL EQUIPMENT

5.1

Provision of Oxygen Equipment

5.1.1 The amount of oxygen to be carried and the number of passengers for whom suitable masks must be made available vary with operating altitude, attainable rate of descent and Minimum Safe Altitude (MSA).

5.1.2 Information and instructions must be provided by the operator to his operating staff to ensure that flights may be conducted in accordance with the relevant legislation. Any aircraft which is not correctly equipped must be appropriately restricted in its use, e.g. by imposition of operating altitude or route restrictions, until such time as an appropriate scale of oxygen and equipment is fitted or repairs effected.

NOTE: Information on the dangers of explosion caused by the proximity of any oxygen equipment, including therapeutic oxygen, to any naked flame or incipient fire must be stressed.

5.2

Re-stowage of Oxygen Masks

It is recommended that cabin crew do not attempt to re-stow oxygen masks after deployment. Damage to the equipment and possibly cabin crew injury may result. Re-stowage of such equipment should be undertaken by maintenance personnel only.

5.3

Portable Protective Breathing equipment

5.3.1 Portable Protective Breathing Equipment (PPBE) must be approved by the **CAD**. Advice on which equipment has been approved may be obtained from the **CAD's** Airworthiness Office.

5.3.2 PPBE units are to be stowed as close to the crew station as practicable and must be readily accessible. Pre-flight serviceability checks must be capable of being readily achieved.

5.3.3 Operators should ensure that transportation security or any other seals are removed prior to installation on the aircraft.

5.3.4 Failures or any problems associated with PPBE must be reported via the Mandatory Occurrence Reporting scheme (MOR) to the Airworthiness Office.

5.4

Carriage of Tropical and Polar Survival Equipment

5.4.1 The AN(HK)O specifies the type and quantity of equipment which is required to be carried on flights over areas where, in the event of an emergency landing, tropical or polar conditions are likely to be met. Such areas are defined as follows:

(a)

Tropical Areas

(i)

those parts of Asia south of latitude 40°N;

(ii) Africa;
(iii) Central and South America; and
(iv) New Guinea and the remote central areas of Australia.
(b)
Polar areas
(i)
areas north of latitude 66°33'N and south of latitude 66°33'S;
(ii)
that area of North America north of 60°N and between longitude 60°W and 175°W (Seasonal);
(iii) that part of Asia north of latitude 40°N and east of longitude 45°E, but excluding mainland Japan (Seasonal); and
(iv) that part of Europe, including the UK, north of latitude 56°N (Seasonal).

5.4.2 Carriage of such equipment is not required if an aircraft flies within the areas detailed at paragraph 5.4.1 of this section and an emergency landing can be made where polar and tropical conditions are not likely to be encountered, provided the same range and performance criteria detailed in the 'circumstances of flight' column of paragraph 4 of Schedule 5 to the AN(HK)O, to establish whether sea survival equipment (scale K) needs to be carried, are not exceeded.

5.4.3 Polar survival equipment will usually be required to be carried during the period November to April inclusive. Flights conducted north of the Arctic Circle are unlikely to be affected by seasonal variations in climate thus requiring the carriage of such equipment at all times of the year.

5.4.4 Some States call for the carriage of particular survival equipment on flights over their territory. Operators should familiarise themselves with these requirements.

5.4.5 Special consideration should be given to the carriage of durable water containers to take advantage of fresh water supplies on board the aircraft.

5.4.6 For operations by helicopters and small aeroplanes in desert areas, where Search and Rescue (SAR) facilities are known to be limited and climatic conditions are particularly inhospitable, tropical equipment will be considered necessary. Similarly for operations in wintry conditions, particularly by helicopters, consideration should be given to the carriage of polar equipment.

5.5
Search and Rescue

5.5.1 The operations manual shall include the ground-air visual signal code for use by survivors, as contained in ICAO Annex 12.

5.6
Carriage of Life-jackets and Flotation Cots for Children and Infants

5.6.1 Arrangements must be made to ensure that appropriate survival equipment is available for children and infants prior to the despatch of an aircraft.

5.6.2 On flights where life-jackets are to be carried, the following equipment is required to be provided for each child and infant:
(a)
children of 3 years and over:
an adult life-jacket which has been approved for use by children;
(b)
infants between 18 months and 3 years:
an approved infant life-jacket;

(c)
infants under the age of 18 months:
an approved flotation cot.
NOTE: Infant flotation devices are approved solely for the purpose of protection and flotation on water and not as restraint devices prior to impact. 'Approved' in the above context refers to the approval obtained by the equipment's manufacturer.
5.6.3 Operators should establish procedures for the provision and re-provision of such equipment, when standard aircraft installations are supplemented by uplifts at route stations.
5.7
Waste Containment
5.7.1 All receptacles for towels, paper and other waste are to be constructed of materials resistant to fire as required by the relevant airworthiness requirements. Their fire containment is to be demonstrated by test.
5.7.2 Waste bags are not approved by the **CAD**. It is, however, the responsibility of the operator to control the quality of their waste bags in order that resistance to fire is maintained; the fire containment must be demonstrated by the test. For further information contact the Airworthiness Office.

5.7.3 Waste bags may only be stowed in toilet compartments during the final phases of flight, provided that they contain only low density waste such as paper and plastic cups.
6
ABNORMAL AND EMERGENCY PROCEDURES
6.1
Turbulence
6.1.1 If turbulence is forecast, the aircraft commander should brief the SCCM prior to departure.
6.1.2 When turbulence is encountered, the commander should direct appropriate action via the SCCM.
6.1.3 If in-flight service is to be discontinued, all trolleys, galleys and cabin equipment are to be secured and checks undertaken to ensure that passengers are seated with their seatbelts fastened.
6.1.4 Cabin crew should take their seats and fasten harnesses as soon as is reasonably practicable.
6.1.5 Operators should have in place procedures regarding the avoidance and handling of in-flight turbulence. Regular review should be carried out with respect to the following:
(a)
Preflight briefing by flight crew to the cabin crew and the passengers of the forecasted turbulence;
(c)
Proper and effective weather assessment before and during flight by all available means;
(d)
Commitment to SOP with regard to seat-belt usage, turbulence and weather avoidance techniques and effective communication during the flight;
(e)
CRM training for crew members;
(f)

Effective training to prevent or mitigate injuries to cabin crew caused by turbulence;

(g)

Establishment of policy and procedures as to when cabin crew should be seated taking into account the potential risk of turbulence in flight.

6.2

Cabin Fires

6.2.1 Cabin attendants must continually survey the aircraft cabin and galley areas for potential and existing fires.

6.2.2 Additionally, a frequent check of toilet areas must be undertaken, noting in particular that smoke sensors remain unblocked.

6.2.3 On detecting a fire and/or smoke, the flight crew must be informed immediately of its location, source and severity and be kept informed as the situation develops.

6.2.4 After a fire has been extinguished, the area around it must be monitored for potential re-ignition.

6.3

Oven Fires

6.3.1 Oven fires can be caused by a variety of factors the dangers of which would be minimised by thorough inspections of ovens both for cleanliness and for the presence of foreign objects.

6.3.2 The primary hazard from an oven fire occurs when the door of a heated oven is opened. The introduction of outside oxygen can cause a flash fire. In dealing with an oven fire or oven overheat, the following procedure is recommended:

(a)

isolate the electrics and keep the door closed. In most incidents the fire will self-extinguish;

(b)

monitor the situation. Have a fire extinguisher, fire gloves and protective breathing equipment (PPBE) to hand; and

(c)

if the situation worsens, or it is thought that fire still exists in the oven, open the oven door just enough to insert the nozzle of the fire extinguisher. Insert the nozzle of the fire extinguisher and discharge a small amount of the extinguishant; consideration should be given to donning PPBE and fire gloves prior to opening the oven door. Close the oven door and monitor the oven. Repeat this procedure if necessary.

6.4

Ban on the use of Therapeutic Oxygen whilst Fire Fighting

The use of therapeutic oxygen whilst fire-fighting is extremely hazardous since therapeutic oxygen may itself feed the fire, thus resulting in severe injuries to the crew member wearing the equipment. Additionally, therapeutic oxygen equipment only provides a low supplemental oxygen flow which will afford little relief in a smoke-laden atmosphere.

6.5

Bomb Warning Procedures

On receipt of a bomb-on-board warning, the SCCM is to implement the procedures detailed in the Operations Manual and associated aircraft checklists, as directed by the aircraft commander.

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Attachment 3

T16

VHNGA NSFA - YSNF

Wordnet transcript

18th November 2009

Frequency 5643 KHz

0711:04	VHNGA	NADI RADIO NADI RADIO NADI RADIO VHNGA ON 56
	VHNGA	NADI RADIO NADI RADIO NADI RADIO VHNGA ON 56
07:16:20	NADI	VHNGA NADI
	VHNGA	YES THIS IS VHNGA WITH A POSITION WHEN YOU ARE READY
	NADI	VHNGA NADI GOAHEAD
	VHNGA	VHNGA WAS APASI 09 FLIGHT LEVEL 390 DUNAK 36
	NADI	VNGA SAY AGAIN ESTIMATE DUNAK
	VHNGA	DUNAK 36 VGA
	NADI	CONFIRM DUNAK 0736
	VHNGA	CONFIRM CONFIRM VGA
	NADI	VGA NADI ROGER FLIGHT LEVEL 390 MAKE PRIMARY THIS FREQUENCY SECONDARY 8867 AND ARE YOU SELCALLED EQUIPPED
	VHNGA	PRIMARY 56 SECONDARY 88 NEGATIVE SELCAL VGA
	NADI	VGA NADI ROGER MAINTAIN LISTENING WATCH
07:37:33	VHNGA	NADI RADIO VHNGA POSITION
	NADI	VNGA NADI GO AHEAD
	VHNGA	VGA DUNAK 36 FLIGHT LEVEL 390 DOLSI 0838
	NADI	VNGA NADI ROGER FLIGHT LEVEL 390 AND DOLSI CONTACT AUCKLAND RADIO AUCKLAND ON 5643
	VHNGA	CONTACT AUCKLAND ON 56 AT DOLSI VHNGA
07:38:59	NADI	VHNGA NADI
	VHNGA	NADI GO AHEAD VHNGA
	NADI	ROGER JUST CONFIRM YOUR DOLSI ESTIMATE 0838
	VHNGA	CONFIRM CONFIRM VHNGA
	NADI	ROGER NADI
07:56:17	VHNGA	NADI RADIO VHNGA REQUEST
	NADI	VNGA NADI
	VHNGA	IS IT POSSIBLE TO OBTAIN A METAR FOR YANKEE SIERRA NOVEMBER FOXTROT PLEASE
	NADI	VNGA NADI STANDBY
08:01:00	NADI	VHNGA NADI
	VHNGA	NADI GO AHEAD VGA
	NADI	ROGER ARE YOU READY TO COPY METAR NORFOLK
	VHNGA	GO AHEAD VGA
	NADI	METAR NORFOLK AT 0630 ZULU WIND 300 09 KNOTS 9999 FEW SIX THOUSAND BROKEN TWO THOUSAND FOUR HUNDRED TEMPERTURE 21 DEW POINT 19 QNH NORFOLK 1011 REMARKS CLOSED TILL 1930 UTC GO AHEAD
	VHNGA	COPIED JUST SAY AGAIN THE ISSUE TIME FOR

T16

		THE METAR
	NADI	ISSUE TIME FOR THE METAR IS THE LATEST 0630 GO
	VHNGA	VGA THANK YOU
	NADI	VNGA NADI
	VHNGA	GO AHEAD NADI VGA
	NADI	ROGER THIS IS THE LATEST WEATHER FOR NORFOLK SPECI I SAY AGAIN SPECIAL WEATHER NORFOLK AT 0800 ZULU AUTO I SAY AGAIN AUTO ALFA UNIFORM TANGO OSCAR WIND 290 08 KNOTS 999 NOVEMBER DELTA VICTOR OVERCAST ONE THOUSAND ONE HUNDRED TEMPERATURE 21 DEW POINT 19 QNH NORFOLK 1012 REMARKS ROMEO FOXTROT ZERO ZERO DECIMAL ZERO OBLIQUE ZERO ZERO ZERO DECIMAL ZERO GO AHEAD
	VHNGA	THANK YOU NADI MUCH APPRECIATED NGA
	NADI	NGA ROGER AT DOLSI CONTACT AUCKLAND THANK YOU
	VHNGA	AUCKLAND AT DOLSI VGA
08:41:22	VNGA	CALLS AUCKLAND AT POSITION DOLSI

T17

VNNGA NSFA - YSNF

Wordnet transcript.

A/G1 Position (Auckland Air-ground)

0600:13	A/G	STATION CALLING AUCKLAND 56 SAY AGAIN CALLSIGN
	VHNGA	VHNGA WITH DEPARTURE
	A/G	VGA AUCKLAND
	VHNGA	WE DEPARTED FALEOLO AT 45 CLIMBING INITIALLY FLIGHT LEVEL 310 REFERENCE 220 RADIAL ESTIMATE LANAT 06 AND KILAN 35 VHNGA
	A/G	REQUEST YOUR PRESENT FLIGHT LEVEL
	VHNGA	PASSING FLIGHT LEVEL 260 VHNGA
	A/G	VGA ROGER FLIGHT LEVEL 260 IN THE CLIMB AUCKLAND PRIMARY GUARD 5643 SECONDARY 8867
	VHNGA	THANK YOU PRIMARY 56 SECONDARY 88 VHNGA
0607:54	A/G	VGA AUCKLAND VHNGA AUCKLAND VHNGA AUCKLAND
	A/G	VGA AUCKLAND GO AHEAD YOUR LANAT
	VHNGA	VHNGA MAINTAINING FLIGHT LEVEL 310 LANAT 09 AND KILAN 36
	A/G	VGA ROGER FLIGHT LEVEL 310
	VHNGA	SAY AGAIN LAST VHNGA
	A/G	JUST READ BACK YOUR LEVEL SIR FLIGHT LEVEL 310
	VHNGA	FLIGHT LEVEL 310 VHNGA
0620:31	A/G	VHNGA AUCKLAND VHNGA AUCKLAND
	VHNGA	AUCKLAND AUCKLAND GO AHEAD VHNGA
	A/G	VGA FROM AUCKLAND CONTROL CLIMB TO REACH FLIGHT LEVEL 350 BY TIME 0630 AND REPORT REACHING FLIGHT LEVEL 350
	VHNGA	CLIMB TO FLIGHT LEVEL 350 WITH A REQUIREMENT 350 BY TIME 30 VHNGA
	A/G	THAT'S CORRECT AND REPORT REACHING FLIGHT LEVEL 350
	VHNGA	WILCO VHNGA
0625:38	OCS	RING
	A/G	AIRGROUND
	OCS	YES CHECK WHERE VHNGA IS IN THE CLIMB AND STOP HIM THERE I AM GOING TO HAVE TO PUSH HIM DOWN AGAIN DUE NADI TRAFFIC
	A/G	AH OKAY
0625:58	A/G	VHNGA AUCKLAND
	VHNGA	AUCKLAND GO AHEAD VHNGA
	A/G	REPORT LEVEL
	VHNGA	PASSING FLIGHT LEVEL 330 VHNGA
	A/G	VGA ROGER STANDBY FOR A NEW CLEARANCE
	VHNGA	VHNGA

0628:40	A/G	VHNGA AUCKLAND
	VHNGA	AUCKLAND GO AHEAD VHNGA
	A/G	FROM AUCKLAND CONTROL DUE TO NADI TRAFFIC DESCEND TO REACH FLIGHT LEVEL 270 BY TIME 0650 AND TO REPORT LEVEL FLIGHT LEVEL 270
	VHNGA	DESCEND FLIGHT LEVEL 270 SAY AGAIN REQUIREMENT
	A/G	TO REACH BY TIME 0650
	VHNGA	0650 FOR 270 VHNGA
	A/G	THAT'S CORRECT AND REPORT REACHING FLIGHT LEVEL 270
	VHNGA	VHNGA
0629:46	VHNGA	AUCKLAND VHNGA REQUEST
	A/G	VGA AUCKLAND
	VHNGA	ARE YOU AWARE OF ANY OTHER TRAFFIC TRACKING WE CAN TAKE IN ORDER TO AVOID THE DESCENT BELOW 310
	A/G	JUST CONFIRM THAT'S REQUESTING IF THERE WAS ANY OTHER TRACK YOU COULD TAKE TO AVOID DESCENDING
	VHNGA	CONFIRM VHNGA IT WILL MAKE THINGS DIFFICULT FOR USE FUEL WISE
	A/G	ROGER SAY AGAIN THE MINIMUM ALTITUDE
	VHNGA	IF POSSIBLE WE WOULD LIKE TO AVOID DESCENT BELOW FLIGHT LEVEL 310
	A/G	ROGER STANDBY
0630:48	VHNGA	AUCKLAND VHNGA WE ARE PRESENTLY CAPABLE OF RECEIVING FLIGHT LEVEL 390 IF AVAILABLE
	A/G	ROGER STANDBY
0633:37	A/G	VHNGA AUCKLAND
	VHNGA	AUCKLAND GO AHEAD VHNGA
	A/G	FROM AUCKLAND CONTROL VGA CLIMB TO REACH FLIGHT LEVEL 390 BY TIME 0650 AND REPORT REACHING FLIGHT LEVEL 390
	VHNGA	CLIMB TO FLIGHT LEVEL 390 BY TIME 50 VHNGA
	A/G	AUCKLAND ROGER
0637:14	VHNGA	VGA IS KILAN AT 36 PASSING FLIGHT LEVEL 350 CLIMBING FLIGHT LEVEL 390 APASI 06
	A/G	JUST SAY AGAIN TIME APASI
	VHNGA	06 VGA
	A/G	VGA AUCKLAND ROGER
0644:00	VHNGA	AUCKLAND VHNGA MAINTAINING FLIGHT LEVEL 390
	A/G	VGA ROGER FLIGHT LEVEL 390 AND AT APASI CONTACT NADI RADIO ON THIS FREQUENCY
	VHNGA	CONTACT NADI AT APASI ON THIS FREQUENCY VHNGA
0841:22	A/G	VHNGA AUCKLAND
	VHNGA	AUCKLAND VHNGA WE HAVE POSITION
	A/G	ROGER GO AHEAD
	VHNGA	VGA WAS DOLSI 39 FLIGHT LEVEL 390 NORFOLK 56

T17

	A/G	VGA PRIMARY THIS ONE SECONDARY 3467 AND JUST CONFIRM NORFOLK 0956
	VHNGA	CONFIRM 0956 VGA COPIED PRIMARY AND SECONDARY
	A/G	AUCKLAND
0904:00	VHNGA	VGA WITH REQUEST
	A/G	VGA AUCKLAND
	VHNGA	REQUEST YANKEE SIERRA NOVEMBER FOXTROT METAR THE 0900 IF AVAILABLE
	A/G	JUST CONFIRMING REQUESTING THE NORFOLK METAR
	VHNGA	CONFIRM CONFIRM VGA
	A/G	JUST STANDBY I WILL GET THE LATEST ONE FOR YOU
	A/G	VGA SPECIAL WEATHER NORFOLK AT 0902 AUTO REPORT 270 07 KNOTS VISIBILITY 7000 METRES CLOUD SCATTERED FIVE HUNDRED BROKEN ONE THOUSAND ONE HUNDRED OVERCAST ONE THOUSAND FIVE HUNDRED TEMPERATURE 20 AND AH AND QNH 1013
	VHNGA	AND IS THERE DEW POINT PLEASE VGA
	A/G	THE DEW POINT ACTUALLY HAS BEEN CUT OFF MY REPORT STANDBY ONE
	A/G	THE DEWPOINT AT TIME 08 HUNDRED ZULU WAS 19
	VHNGA	THANK YOU
0916:02	A/G	VHNGA AUCKLAND
	VHNGA	AUCKLAND GO AHEAD VGA
	A/G	REQUEST TOP OF DESCENT NORFOLK
	VHNGA	TOD TIME 0940 VGA
	A/G	ROGER AND THE CORECT TEMPERATURE DEWPOINT FOR THE 0900 REPORT ON NORFOLK IS TEMPERATURE 20 DEWPOINT 19
	VHNGA	VGA THANK YOU
0932:00	A/G	VHNGA AUCKLAND VHNGA AUCKLAND
	VHNGA	AUCKLAND GO AHEAD VGA
	A/G	VGA FROM AUCKLAND CONTROL YOU ARE CLEARED WHEN READY LEAVE CONTROLLED AIRSPACE BY DESCENT REPORT PASSING FLIGHT LEVEL 240 AND NO REPORTED IFR TRAFFIC
	VHNGA	CLEARED TO LEAVE ON DESCENT WILL REPORT 240 VGA
	A/G	ROGER AND I HAVE THE LATEST SPECIAL WEATHER ON NORFOLK WHEN READY
	VHNGA	GO AHEAD VGA
	A/G	ROGER AT 0930 AUTO REPORT THE WIND 200 07 KNOTS VISIBILITY 4 THOUSAND 5 HUNDRED METRES CLOUD BROKEN 2 HUNDRED BROKEN 6 HUNDRED OVERCAST ONE THOUSAND ONE HUNDRED TEMPERATURE 20 DEW POINT 19 AND STANDBY QNH QNH 1013
	VHNGA	VGA THANK YOU

T17

0946:50	VHNGA	AUCKLAND THROUGH FLIGHT LEVEL 240
	A/G	VGA ROGER REPORT ON THE GROUND NORFOLK
	VHNGA	WILCO VGA
1008:00	A/G	RING
	OCS	YES
	A/G	I HAVE TRIED TO CALL VHNGA A COUPLE OF TIMES BUT NO REPLY AS YET
	OCS	OKAY I WILL RING UP NORFOLK AND FIND OUT
	A/G	OKAY
1040:18	OCS	RING
	A/G	AIR GROUND
	OCS	CAN YOU GIVE CALL TO VHNGA NORFOLK SAYS THEY HAVE LOST CONTACT WITH IT TO SEE IF HE IS STILL IN THE AIR AND IF HE CAN CALL NORFOLK ON VHF IF YOU CANT GET HOLD OF HIM JUST SELCAL ANZ87 HE HAS ALREADY PAST OUR BOUNDARY AND ASK HIM TO CALL ON 121.5
	A/G	WILDO
1040:20	A/G	VHNGA VHNGA ON 5643 DO YOU READ VHNGA AUCKLAND 56
1042:35	A/G	ANZ87 COULD YOU PLEASE TRY CALLING AN AIRCRAFT VHNGA ON 121.5 AND IS IF YOU CAN RAISE HIM HE WAS MAKING AN APPROACH INTO NORFOLK ISLAND
1044:41	ANZ87	AUCKLAND ANZ87 ON 8867
	A/G	ANZ87 AUCKLAND
	ANZ87	NO REPLY ON 121.5 or 120.5
	A/G	ANZ87 AUCKLAND ROGER

T17

CWS1 Position (Auckland Oceanic)

0833:11	NFMTAF	RING
	OCS	AUCKLAND OCEANS
	NFMTAF	GOOD EVENING GUY ITS LARRY HERE FROM NORFOLK ISLAND HOW ARE YOU GOING TONIGHT
	OCS	PRITY GOOD
	NFMTAF	I WAS AFTER VHNGA IT'S A MEDIVAC
	OCS	IS YOUR WEATHER GOING TO BE CONDITIONAL TO HIM DUE THERE ABOUT 0955
	NFMTAF	0955
	OCS	YEP
	NFMTAF	HE'S REALLY RUNNING LATE IS'NT HE
	OCS	YEP
	NFMTAF	OKAY GUY THANKS FOR YOUR HELP
	OCS	WHAT IS YOUR CLOUD BASE THERE AT THE MOMENT
	NFMTAF	CLOUD PROBABLY ABOUT 3 AT 3 HUNDRED 3 OCTAS 4 AT 6 AND 8 AT ELEVEN HUNDRED
	OCS	CLIMB AROUND THE ISLAND AND VMC AND THEN CLIMB UP IN THE CLOUD TO GET BACK IN WOULD HE
	NFMTAF	I DON'T THINK SO BRO
	OCS	I WAS SITTING UP THERE A FEW YEARS AGO WATCING A GUY DOING THAT GOING ROUND AND ROUND UNDERNEATH THE CLOUD BASE BUT COULD NOT GET UP TO THE BLOODY RUNWAY BECAUSE IT WAS IN CLOUD
	NFMTAF	THE HUMIDITY IS RIGHT UP HERE TONIGHT WE GOT ABOUT 92 PERCENT AND TEMPERATURE 20 STARTING TO GET INTERESTING
	OCS	YES
	NFMTAF	THANKS FOR YOUR HELP GUY
	OCS	YEAH
	NFMTAF	BYE NOW
0934:16	OCS	RING
	A/G	AIR GROUND
	OCS	YEAH DO YOU NORMALLY GET SPECI ON THIS NORFOLK FROM THIS AUTOMATIC WEATHER STATION
	A/G	YEAH I HAVE GIVEN HIM THE LATEST ONE
	OCS	OKAY THANK YOU
	A/G	YEP
	OCS	SOMETHING NEW NEW TO ME
	A/G	OKAY WE GET THE AUTOS AND I HAVE PASSED THE LATEST ONE BUT
	OCS	OKAY THANK YOU
	A/G	HE DIDN'T SAY ANYTHING SO
	OCS	IT DOESN'T LOOK VERY GOOD THERE
	A/G	NO IT DOESN'T DOES IT
	OCS	NO LOW CLOUD YEAH HE DOESN'T HAVE AN ALTERNATE EITHER
	A/G	HES NOT DO YOU WANT ME TO ASK HIM IF HES GOT ONE
	OCS	HE HASN'T GOT IT ON HIS FLIGHT PLAN SO HE MIGHT JUST CALL US UP ANYWAY IF DOESN'T GET IN

	A/G	OKAY
0935:10	OCS	RING
	NFMTAF	AIRPORT INFORMATION
	OCS	YARN THIS IS USHMEN HERE FROM AUCKLAND OCEANIC HOW IS THE WEATHER DOING THERE SIR
	NFMTAF	THEY JUST HAVE ASKED ME TO COME ON THE RUNWAY ITS CLOSING IN A FAIR BIT I STILL THINK HE HAS A GOOD OPPORTUNITY TO GET IN HERE
	OCS	OKAY HE WILL GET IN
	NFMTAF	AT THIS TIME I WOULD SAY WE HAVE A WET SHOWER A BIT OF A SHOWER GOING THROUGH THE FIELD WHICH HAS CUT DOWN THE VIS BUT ITS NOT TOO BAD AT THIS TIME
	OCS	OKAY OKAY CHANCES ARE HE IS GOING TO GET IN
	NFMTAF	YEAH
	OCS	YEAH I WAS CONCERNED LOOKING AT YOUR WEATHER THERE I WAS REALLY CONCERNED WHETHER HE WAS GOING TO GET IN OR NOT YOU KNOW
	NFMTAF	HAS HE GOT AN ALTERNATE HAS HE TOLD YOU AN ALTERNATE AT ALL
	OCS	NO HE HASN'T TOLD ME THERE IS NO ALTERNATE ON HIS FLIGHT PLAN I CHECKED AS WELL SO I DON'T KNOW WHAT GOING TO HAPPEN SO I WILL JUST WAIT TO HEAR FROM YOU WHEN HE IS SAFELY ON THE GROUND
	NFMTAF	OKAY I WILL GIVE YOU A CALL CAUSE HE HAS CALLED ME ALREADY I AM NOW JUST ON THE RUNWAY NOW HAVING A LOOK BUT THE VIS HAS DEFINITELY DROPPED AT THIS TIME BECAUSE OF THE RAIN THAT WE GOT COMING THROUGH HERE NOW
	OCS	YEAH I CAN SEE ITS ALL OVERCAST AT 900 FEET YOU KNOW
	NFMTAF	IT IS IT IS A BIT OVERCAST AT 900 AT THIS TIME
	OCS	OKAY YARN
	NFMTAF	GOODBYE
1008:00	A/G	RING
	OCS	YES
	A/G	I HAVE TRIED TO CALL VHNGA A COUPLE OF TIMES BUT NO REPLY AS YET
	OCS	OKAY I WILL RING UP NORFOLK AND FIND OUT
	A/G	OKAY
1008:46	OCS	RING
	NFMTAF	AIRPORT LARRY SPEAKING
	OCS	HI AUCKLAND OCEANIC WHATS HAPPENING WITH VHNGA
	NFMTAF	YEAH NGA HE HAS JUST HAD ONE MISSED APPROACH HES GONE BACK UP TO GET HIMSELF BACK TOGETHER AND HES GOING TO TRY AGAIN
	OCS	OKAY
	NFMTAF	SO HE STILL HANGING OUT WAITING HE SAYS HE HAS NO ALTERNATE
	OCS	OH NO ALTERNATE AH WELL HE'LL HAVE TO LAND

T17

		AH
	NFMTAF	YEAH HE WILL HAVE TO MAKE UP HIS MIND VERY SHORTLY BECAUSE WE LOOK TO GET THE WEATHER FOR TONTOUTA NOUMEA WAS GOOD THIS TIME
	OCS	OKAY DO YOU WANT US TO GET THE WEATHER FOR TONTOUTA
	NFMTAF	UM CAN YOU BE IN CONTACT WITH HIM OR I CAN GET IF OFF THE NET IF YOU LIKE BUT
	OCS	OKAY YOU CAN THAT'S FINE WITH ME
	NFMTAF	OKAY I WILL PULL THE WEATHER UP HERE AND HAVE A LOOK
	OCS	OKAY OKAY NO WORRIES MATE THANKS LET ME KNOW WHAT HE IS DOING
	NFMTAF	I CERTAINLY WILL
	OCS	THANKS MATE
	NFMTAF	BYE NOW
1009:00	OCS	RING
	A/G	AIRGROUND
	OCS	HE IS JUST DONE A MIS APPROACH AND CARRY OUT ANOTHER APPROACH
	A/G	OKAY THANKS
1028:15	NFMTAF	RING
	OCS	AUCKLAND OCEANIC
	NFMTAF	YEAH GOOD EVENING ITS MURRAY AT NORFOLK HOW ARE YOU DOING
	OCS	SORRY
	NFMTAF	YOU THERE MATE MURRAY AT NORFOLK
	OCS	YEAH
	NFMTAF	THE PILOT HAS DECLARED AN EMERGENCY HERE AT THIS TIME THEY ARE WORKING OUT THAT THEY HAVE NO MORE FUEL TO CONTINUE ON AND THE WEATHER HERE IS STILL BAD AT THIS TIME THEIR WORKING OUT TO HAVE ONE MORE GO OTHERWISE THERE GOING TO DITCH THIS THING
	OCS	DITCH MY GOD
	NFMTAF	I HAVE JUST GIVEN YOU I WILL JUST PUT YOU ON STANDBY NOW UNTIL I TALK TO THESE GUYS I HAVE ACTUALLY INITIATED FULL EMERGENCY PROCEDURES HERE AT THE AIRPORT
	OCS	OKAY NO WORRIES MATE I WILL ADVISE MY SEARCH AND RESCUE HERE
	NFMTAF	OKAY I WILL GIVE YOU A CALL WHEN I KNOW SOMETHING
	OCS	OKAY
1030:29	OCS	RING NZ RCC TO ADVISE THE SITUATION
1039:38	NFMTAF	RING
	OCS	AUCKLAND OCEANIC
	NFMTAF	GOOD EVENING AUCKLAND OCEANIC LARRY AGAIN ON NORFOLK ISLAND WE HAVE LOST WE HAVE LOST RADIO CONTACT WITH THEM ON VHF ARE YOU ABLE TO CONTACT NGA ON HF FOR US
	OCS	OKAY YOU HAVE LOST CONTACT WITH HIM IS

T17

		IT
	NFMTAF	I HAVE LOST CONTACT WITH HIM HE IS NOT ANSWERING HIS RADIO AT THIS TIME
	OCS	OKAY WE WILL TRY ON HF MATE I WILL CALL YOU BACK
	NFMTAF	CAN YOU CALL ME BACK
	OCS	OKAY I WILL
1040:18	OCS	RING
	A/G	AIR GROUND
	OCS	CAN YOU GIVE CALL TO VHNGA NORFOLK SAYS THEY HAVE LOST CONTACT WITH IT TO SEE IF HE IS STILL IN THE AIR AND IF HE CAN CALL NORFOLK ON VHF IF YOU CANT GET HOLD OF HIM JUST SELCAL ANZ67 HE HAS ALREADY PAST OUR BOUNDARY AND ASK HIM TO CALL HIM ON 121.5
	A/G	WILDO
1042	OCS	TO NZRCC RE ALERFA AND COPY OF THE FPL NORFOLK LOST CONTACT
1046:14	OCS	RING
	NFMTAF	AIRPORT LARRY SPEAKING
	OCS	AUCKLAND OCEANIC WE DON'T HAVE ANY CONTACT WITH THE AIRCRAFT
	NFMTAF	NONE AT ALL SIR WE HAVE NO CONTACT WITH THE AIRCRAFT AT ALL
	OCS	HAVE YOU SPOKEN TO THE SEARCH AND RESCUE HERE IS IT
	NFMTAF	YEP WE HAVE NOTIFIED THE SEARCH AND RESCUE
	OCS	I HAVE PUT OUT AN ALERFA ON THE AIRCRAFT SAR HAVE A COPY THEY ARE HANDLING IT NOW ALSO IF YOU HEAR ANYTHING FURTHER COULD YOU LET US KNOW PLEASE
	NFMTAF	CERTAINLY I WILL GIVE YOU ANY INFORMATION WHEN I FIND OUT
	OCS	THANKS MATE
1048	RCC TO OCS QUERY ANY OTHER AIRCRAFT IN THE VICINITY OF NORFOLK ISLAND	
1052	OCS TO NADI QUERY ANY AIRCRAFT CLOSE TO NORFOLK TO LISTEN OUT 121.5	

Attachment 4

Australian Government

Department of Transport and Regional Services

Regulation Impact Statement

National Airspace System

Characteristic 29 (Stage 2c)

Operations at Non-Towered Aerodromes

Amendment to Regulations 166 and 167 of the

Civil Aviation Regulations 1988

ORR Ref 6020

Table of Contents

Abbreviations

AGL	Above Ground Level
AIP	Aeronautical Information Publication
ALARP	As Low As Reasonably Practical
ARC	Acceptable Risk Criteria
ARG	Aviation Reform Group (later substituted by NASPAG and NASIAG)
ARM	Airspace Risk Model
ASA	Airservices Australia
ATC	Air Traffic Control
ATS	Air Traffic Services
BTRE	Bureau of Transport and Regional Economics
CAR	Civil Aviation Regulations (1988)
CASA	Civil Aviation Safety Authority
CHTR	Charter
CTAF	Common Traffic Advisory Frequency
CTAF<*frequency*>(R)	Indication that radio carriage and use is required to operate at a particular aerodrome
DOTARS	Department of Transport and Regional Services
DTI	Directed Traffic Information
FAA	Federal Aviation Administration of the USA
FAR	Federal Aviation Regulation of the FAA
GA	General Aviation
IAS	Indicated Air Speed
ICAO	International Civil Aviation Organization
IFR	Instrument Flight Rules
KT	Knots
MBZ	Mandatory Broadcast Zone
MULTICOM	Pilot-to-pilot communication frequency (126.7) at aerodromes not having a discrete frequency
NASIG	National Airspace System Implementation Group (an agency of DOTARS)
NASIAG	NAS Inter-Agency Group
NASPAG	NAS Planning Advisory Group
NFRM	Notice of Final Rule Making
NPRM	Notice of Proposed Rule Making
NM	Nautical Mile
POB	Persons on Board
SIA	Straight-in Approach

TMA	Terminal Control Area
UNICOM	An aerodrome radio advisory service usually on the CTAF
VFR	Visual Flight Rules
VMC	Visual Meteorological Conditions

Definitions

Airspace classifications means airspace classified by ICAO (Classes A to G) according to:

- The service provided (separation, traffic advisories, flight information service, collision avoidance)
- Type of flight permitted (IFR, VFR or both)
- Visual meteorological conditions (VMC) criteria
- Radio communication requirements
- Air traffic control (ATC) clearance requirements.

Air Traffic Service has the same meaning as defined in ICAO Annex 11, viz. a generic term meaning variously, flight information service, alerting service, air traffic advisory service, air traffic control service (area control service, approach control service or aerodrome control service).

CTAF means a common traffic advisory frequency assigned for the purpose of aircraft radio communication on or in the vicinity of a non-towered aerodrome.

CTAF<*frequency*>(R) indicates for an aerodrome that carriage and use of radio is required to operate in the vicinity.

In the vicinity means within 10NM of a non-towered aerodrome.

Non-towered aerodrome means an aerodrome without an operating ATC tower. Includes aerodromes with an ATC tower outside the hours that the ATC service is being provided

UNICOM (Universal Communications) is a non-ATS radio communications service usually on the CTAF at a non-towered aerodrome that may provide advisory aerodrome information.

VHF means the very high frequency aeronautical radio band used for aircraft to aircraft communication.

Synopsis

Introduction	This regulation change is needed in order to progress a key stage of the Government's airspace reform agenda. The airspace reforms are known as the National Airspace System (NAS) and are based on the United States airspace system. To implement airspace reform, the airspace system has been broken down into identifiable components called "Characteristics" of the NAS. The implementation of airspace reform is programmed in stages for safety reasons. Stage 2c of the NAS comprises two Characteristics: Characteristic 29 "Operations at Non-Towered Aerodromes" and Characteristic 6 "Encouraging Unicom". These regulation changes are necessary to implement Characteristic 29. A non-towered aerodrome is any aerodrome without an operating air traffic control tower service. This includes aerodromes with a part-time tower during those hours when the ATC tower service is not operating.
Main reason for the change to CAR 166	Presently CAR 166 requires that pilots of all aircraft must fly at least three legs of a circuit when approaching to land at a non-towered aerodrome. Limited exemptions to this requirement are granted at current Australian MBZs and CTAFs which allow pilots to conduct straight-in approaches under some conditions. The NAS changes allow all radio-equipped aircraft to conduct a straight-in approach at any non-towered aerodrome in Australia when it is safe to do so.

Reason for other changes to CAR 166 and CAR 167	As a result of its Notice of Proposed Rulemaking (NPRM) consultation process, CASA specified that aircraft will be required to carry and use radio when operating in the vicinity of some aerodromes. They further required carriage and use of radio for any aircraft conducting a straight-in approach at any aerodrome. To achieve these requirements, further changes to CAR 166 and CAR 167 were necessary. Existing and proposed versions are at Annexes A and B respectively.
Impact scope	This RIS assesses the impact of the entire Characteristic 29 change proposal rather than simply the impact of the direct changes to CAR 166 and CAR 167.

Impact

A benefit-cost analysis of Characteristic 29 was commissioned. A copy of the benefit-cost report is attached as Annex C.

Key benefits relate to safety improvements associated with the introduction of more standardised broadcasts (rather than the current patchwork of location-specific systems), and more systematic procedures in and around the circuit at non-towered aerodromes. A major benefit is the option for more aircraft to adopt straight-in approaches at all aerodromes. This delivers fuel saving and time savings to passengers and pilots. Smaller benefits relate to reduced training time requirements and other types of fuel saving benefits.

Operational costs are faced by some regional operators when departing an aerodrome in some directions. There are also some first year implementation costs to regulatory and service provision agencies.

The overall net benefit results for the NAS 2c Characteristic 29 are positive and substantial.

Over the next 10 years in NPV terms, implementing this change will generate net economic benefits of $32.2 million (see table below) with 90% confidence that the benefits are between $27.2 million to $39.1 million.

While NAS 2c generates an overall benefit to the economy, the costs and benefits are spread unevenly. For MBZ aerodromes being designated CTAF<*frequency*>(R), the central scenario indicates a small net cost (though this is not statistically significantly different from zero). However for the old CTAF aerodromes becoming US-style CTAF there is a considerable positive net benefit and for Multicom aerodromes there is also a considerable positive net benefit.

Cost-benefit results table

	MBZ	**Old CTAF**	**Multicom**	**Total**
Benefits	$0.51m	$18.75m	$14.51m	$33.77m
Costs	$0.69m	$0.44m	$0.42m	$1.55m
Net Benefits	**-$0.18m**	**$18.31m**	**$14.09m**	**$32.22m**

ORR Ref 6020

Regulation Impact Assessment

Background

ORR Ref 6020

Government Direction

Airspace reform has been on the Government's agenda over the past decade. Consultation has been a feature of the reform programme throughout this period and it is likely that the aviation community's views on airspace issues are better understood than they are on any other subject. Consultation however, cannot equal consensus on such a complex subject when there are so many different participants, all with different needs. Past attempts to achieve a consensus on airspace reform have usually led to compromises, which have tended to make simple systems more complex and would have introduced Australian unique requirements or procedures into our airspace.

Recognising the need for reform, the Minister for Transport and Regional Services, the Hon John Anderson MP, announced the Government's aviation reform programme on 15 February 2002. On 22 February 2002 the Minister announced the Terms of Reference for the Special Aviation Reform Group (ARG) set up to undertake the airspace reform process.

The ARG consisted of Mr Ted Anson, Chairman of the Civil Aviation Safety Authority (CASA), Mr John Forsyth, Chairman of Airservices Australia (AA), Air Marshal Angus Houston, Chief of Air Force (CAF), Department of Defence and Mr Dick Smith. The ARG was assisted by an Executive Officer, Mr Martin Dolan, First Assistant Secretary, Aviation and Airports Policy Division, Department of Transport and Regional Services (DOTARS).

The stated role of the ARG was to recommend to Minister Anderson a preferred plan for the reform of Australia's low level airspace. In coming to its view the ARG was tasked to consider two competing proposals:

- the Airspace Working Group's Low Level Airspace Reform Plan (LLAMP); and,
- the NAS based on the United States (US) system.

The ARG recommended the NAS be selected as the preferred model for future airspace reform in Australia.

On 13 May 2002, the Minister announced that, after a submission to Cabinet, the Government had accepted the recommendations made by the ARG that the NAS be adopted as the model for reform of Australian airspace.

The fundamental features of the NAS are its simplicity, its compliance with International Civil Aviation Organization (ICAO) airspace practice and its allocation of services on the basis of risk.

Continued on next page

Background, Continued

The need for change

The importance of international standardisation and harmonisation in airspace architecture, air traffic service (ATS) provision and aircraft operating procedures is recognised by all advanced aviation States and organisations. While aviation systems employed by individual nations may have developed and evolved in isolation for historic reasons, the existence of diverse aviation systems is no longer viable in a modern global aviation market and operating environment. The growth in international aviation activity, the growing need for ATS and avionics system interoperability, the increasing reliance on automation and technology and safety considerations are principle drivers towards a common and global system architecture.

Some features of the current Australian airspace system are unique in the world, a situation that is unsustainable over the longer term in an increasingly globalised aviation market.

Over-regulation must be avoided for Australia to remain competitive. The once thriving market for general aviation in Australia is in decline. Between 1990 and 2002, hours flown in general aviation have declined by 13%.

Why the NAS?

In the early 1990s, Australian airspace design and management was identified as an area that needed review in terms of international best practice and global harmonisation. ICAO classifications of airspace were introduced and some reform was made in procedural design. While many major aviation stakeholders were keen to redesign and modernise the system, it proved difficult to reconcile all the perceived needs and to overcome the "home grown" and ingrained operating cultures. Despite the best of intentions, these attempts at system design change have faltered.

As mentioned earlier, the fundamental features of the NAS are its simplicity, its compliance with International Civil Aviation Organization (ICAO) airspace practice and its allocation of services on the basis of risk.

The NAS proposes the adoption of airspace architecture based on international best practice and a systems approach, rather than a process of selective modification to the uniquely Australian system. The Australian NAS provides the design template and principles that integrate Australian aviation into the global model, while drawing on the US system as representing world's best practice for both radar and procedural Air Traffic Management (ATM) systems.

The NAS is a system

It is important to realise that many of the benefits of implementing the NAS arise from the fact that the NAS is an overall system adopted as Government policy.

In considering a broad system implementation, the impact analysis should really assess the net benefit of the overall change, rather than the impact of each particular component in isolation. This is because a policy to pursue an overall system benefit might involve some positive and negative benefits in particular components of the system. A BTRE project to quantify the economic benefits of the overall NAS has been started; however this is a long-term project lasting beyond the timeframe of NAS Stage 2c.

The proposed Characteristic 29 (Operations at Non-towered Aerodromes) is only one component of the overall NAS. This Regulation Impact Statement is thus focused on only one component of the NAS, and analyses in detail the regulatory impact of that component in isolation. It shows that the change has a strong positive Net Present Value (NPV).

Introduction

The regulation proposal in context

This regulation change proposal is a component of the overall NAS changes. It is necessary to amend CAR 166 because it presently requires pilots of all aircraft to fly three legs of a circuit when approaching to land at an aerodrome. The proposed Characteristic 29 will allow straight-in approaches for all radio-equipped aircraft. Other changes became necessary as a result of CASA requirements following the CASA Notice of Proposed Rulemaking (NPRM) public consultation process.

The scope of this RIS

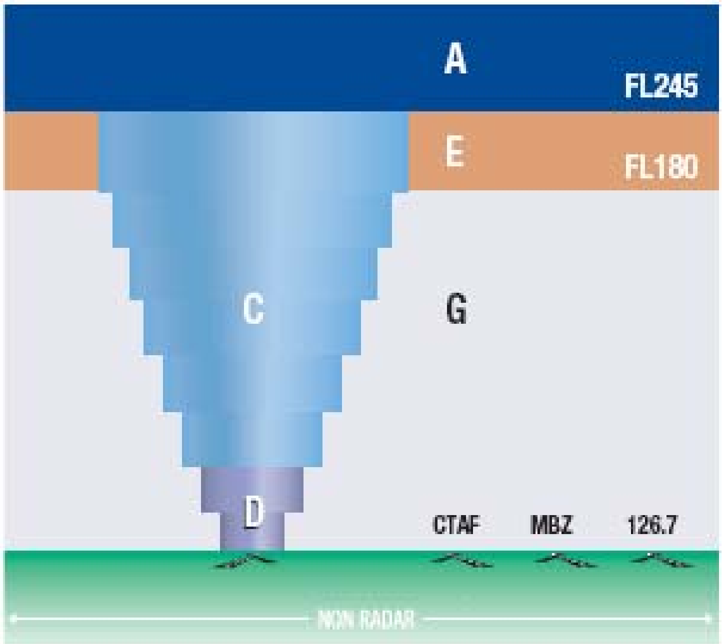
This RIS covers the entire scope of the procedures proposed for operations at non-towered aerodromes. That is, it covers the whole of Characteristic 29 including all the features that are not directly related to the proposed change to CAR 166.

It does not include assessment of the overall benefits of enabling the full suite of NAS changes.

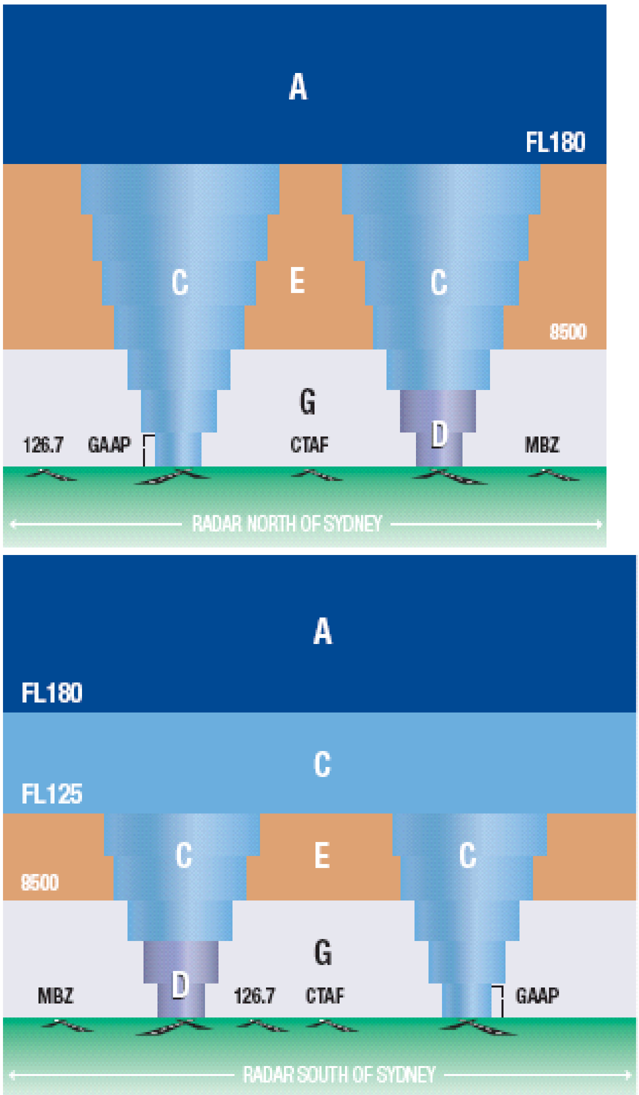
This proposal applies to non-towered aerodromes in Class G airspace.

Distribution of current Australian airspace classifications

Current non-radar airspace:



Current radar airspace



Australian Class G airspace

Australian Class G airspace differs significantly from ICAO Class G.

In Australian Class G airspace air traffic controllers provide IFR aircraft with a traffic information service on other IFR aircraft. As such, Australian Class G airspace is more closely aligned to ICAO Class F airspace.

Other Australian variations of ICAO Class G

Within present Australian Class G airspace, additional procedures are established at certain individual aerodromes. The aerodromes affected by the proposed regulatory changes are currently classified as MBZ, CTAF or Multicom. These are explained below.

At some aerodromes in present Australian Class G airspace, Mandatory Broadcast Zones (MBZ) are established in a defined volume of airspace. MBZs are generally established within a 15NM radius of the individual aerodrome from the ground up to 5,000 ft. All aircraft operating in this airspace must be equipped with a serviceable radio and are required to make certain radio calls. There are additional rules as to how the aircraft can approach the aerodrome for landing.

At some aerodromes in Australian Class G airspace, Common Traffic Advisory Frequencies (CTAF) are established in a defined volume of airspace. CTAFs are generally established within a 5NM radius of the individual aerodrome from the ground up to 3,000 ft. Aircraft operating in this airspace are not required to be radio equipped, however those that do have radio are required to make certain radio calls. There is another set of rules as to how the aircraft can approach the aerodrome for landing.

The remaining aerodromes in Australian Class G airspace are termed Multicoms. Unlike CTAFs and MBZs, Multicoms do not have a defined dimension however the procedures are generally similar to that used in a current CTAF, with some differences.

A key change in NAS Stage 2c is to simplify these three dissimilar sets of procedures into one common set of procedures for use at all aerodromes in Class G airspace.

Other services in Class G airspace

At aerodromes in Class G airspace, an aerodrome operator or other interested party, for example an airline or local aero club, may establish its own third party on ground radio advisory service to provide basic aerodrome information to pilots operating at the aerodrome. This is known as a UNICOM service, and DOTARS will be encouraging more of these in the future as part of the Stage 2c implementation.

The aerodrome operator or other interested party may provide a Certified Air Ground Radio Service (CA/GRS). This is a more highly regulated type of UNICOM service unique to Australia. A CA/GRS provides weather and runway information to pilots and can also provide traffic information. The person who provides the CA/GRS, a Certified Air/Ground Radio Operator (CA/GRO) must meet certain criteria as defined by CASA and comply with CASA requirements. This will continue as an option.

Circuit Procedure

For the past 60 years a standard procedure has been adopted for any light aeroplane approaching to land at a non-controlled aerodrome. This procedure is called the standard circuit and is adopted by convention rather than laid down by regulation.

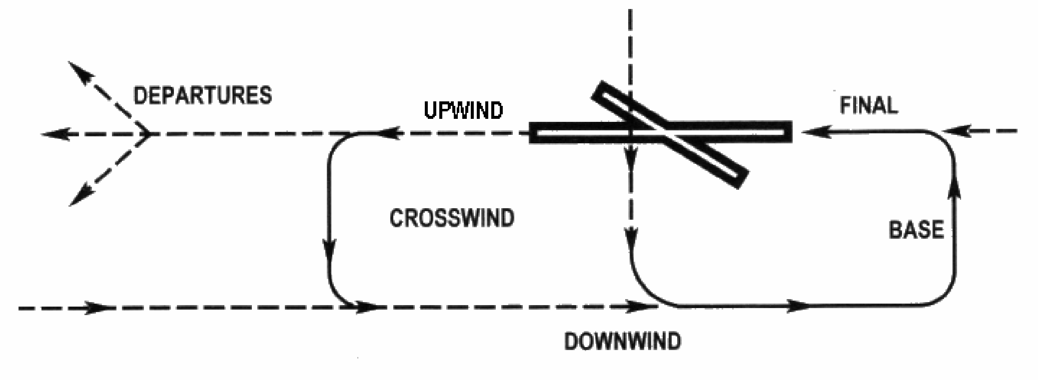
The circuit is aligned with the active runway and may be either left- or right-handed. Liveside is the side of the circuit in operation which arriving aircraft join for landing. The deadside is the opposite side.

CAR 166 requires that an aircraft track over at least three legs of a rectangular course aligned with the runway or landing strip which is most into-wind. Turns, once established within the circuit, will all be in the same direction, usually to the left unless terrain or ground habitation dictate otherwise; and the downwind leg will be flown at moderate speed [adjusted to avoid overtaking preceding aircraft] and holding a constant height – normally 1000ft above the airfield.

Standard Circuit Diagram

DEADSIDE

ORR Ref 6020



LIVESIDE

The problem

The Problem

There are presently three dissimilar sets of procedures at aerodromes in Australian Class G airspace. This means Australia has a more complex and unique operating and regulatory environment at these aerodromes than other countries. The present Australian procedures are unnecessarily preventing some pilots from using more efficient procedures, and the extra complexity of having three different sets of procedures together with lack of needed guidance in other areas means that collision risk is higher than it needs to be.

As explained earlier, the aerodromes affected by the proposed regulatory changes are currently classified as MBZ, CTAF or Multicom. Each has different operating procedures, radio requirements and dimensions.

Simplifying and standardising these procedures will produce both safety and efficiency benefits, as will the provision of clear explanatory and guidance material.

Objectives of NAS

The overall objectives of NAS are to:

- increase Australia's level of compliance with ICAO airspace classifications, while at the same time moving towards international best practice, often considered to be synonymous with existing US practice;
- reduce costs to operators in low level airspace and to remove any inherent cross-subsidisation of low level airspace operations by high level airspace users, usually the large commercial passenger airlines;
- foster aviation in Australia by optimising safety and providing services that correspond with risk and demand; and
- reduce 'over-servicing' of aircraft whose operations require a lesser level of service.

Main aim of CAR 166 change

NAS Stage 2c aims to produce both safety and efficiency benefits by simplifying and standardising three procedures into one, and by producing clear explanatory and guidance material in areas where guidance is presently lacking, especially in relation to sports aviation.

The main aim of changing CAR 166 is to permit more aircraft to fly less than three legs of the circuit, including the flying of straight-in approaches. It also emphasises that pilots must take all reasonable steps to ensure that they do not cause a danger to other aircraft being operated in the vicinity of the aerodrome. This is an important element of the US system.

A secondary aim of the changes is to incorporate a CASA requirement to carry and use radio at some aerodromes after their consultation process. CASA issued a Notice of Proposed Rule Making (NPRM 0401AS) to initiate formal consultation on the proposed amendment to CAR 166. This NPRM canvassed the entire suite of Characteristic 29 changes “Operations at Non-towered Aerodromes”, not just the changes to CAR 166. This consultation led to CASA specifying that

- Carriage and use of radio will be required at some aerodromes, and
- Only radio-equipped aircraft may conduct a straight-in approach at any aerodrome.

Options

Options for Characteristic 29

Four options were considered for implementing Stage 2c of the NAS.

1. Trial new procedures prior to implementation;
2. Phased introduction of new procedures (at Australian CTAFs first then once proven, to current MBZs at a later Stage);
3. Introduce full suite of new US procedures across all aerodromes in Australia at the same time; and,
4. **Introduce new procedures but alter them to preclude straight in approaches for non-radio aircraft and retain a radio requirement at some aerodromes; (Option 4 is adopted).**

Options 1, 2 and 3 were subject to preliminary assessment against option 4. The preferred option 4 was subject to a full benefit-cost analysis (see next section) against the status quo. A copy of this benefit-cost analysis is attached as Annex C.

Assessment of options

Option 1: trial the procedures

- A key objective of the changes is to provide a simple, standard set of procedures for all aerodromes in Australia. Introducing a trial at one or some aerodromes would add to the complexity of present operations because it would introduce yet another set of procedures in addition to those already in place. A trial cannot validly assess this system.

Option 2: phase the implementation

- Introducing the procedures at Australian CTAFs first, and then later at MBZs and other Australian aerodromes would also increase the complexity of the system as in Option 2 above, and fail to achieve the simplicity and standardisation objective. A simplified set of standard procedures at all non-towered aerodromes in Australia makes it easier for all pilots to operate safely.

Option 3: full introduction at all aerodromes

- Implementing the full US NAS procedures for operations at non-towered aerodromes in Australia would ensure maximum harmonisation with the US system.
- The replacement of mandatory broadcasts with a suite of standard recommended position based broadcasts allows pilots operational flexibility and also increases participation rates.
- Any imposition of mandatory calls or mandatory requirements moves away from the philosophy underlying the change.

Option 4: modified procedures at all aerodromes (ADOPTED)

- As would be expected, some pilots (a minority) are anxious about changing long-standing procedures to something they have no experience with. The main concerns (expressed primarily by regional airline pilots) relate to allowing the possibility of non-radio aircraft operations at what are currently MBZ aerodromes.
- This option therefore introduces the US procedures with the exceptions that:
  - Carriage and use of radio will be required at some aerodromes, and
  - Only radio-equipped aircraft may conduct a straight-in approach at any aerodrome.
- This option largely harmonises with the US procedures, and captures most of the benefits of simplification and standardisation of procedures at all Australian non-towered aerodromes while meeting these pilots concerns.
- This option has been fully assessed in a benefit-cost analysis. (See next section). A copy of this benefit-cost analysis is attached as Annex C.

Assessment of impacts

Groups affected

The main groups affected by these changes are:

- All (35,000) active Australian pilots,
- Airline operators, particularly regional airline operators,
- General aviation business operators, including training, charter, aerial work and agricultural,
- Airline passengers,
- Aerodrome operators of non-towered aerodromes, and
- People living near non-towered aerodromes.

Australia has approximately 2,250 known airstrips, airfields, aerodromes or other such facilities for aircraft to takeoff and land. Of these, approximately 37 aerodromes have a control tower service (operating as an MBZ out of hours), around 76 operate as an MBZ for 24 hours a day, around 387 are CTAF and the remainder operate as a Multicom on frequency 126.7.

Benefit-cost analysis

DOTARS commissioned Access Economics to provide an independent assessment of the economic benefits and costs of implementing NAS Stage 2c, Characteristic 29 as amended to incorporate CASA's requirements.

A copy of the benefit-cost report is attached as Annex C.

Key benefits relate to safety improvements associated with the introduction of more standard broadcasts (rather than the current patchwork of location-specific systems), and more simple, standard procedures in and around the circuit at non-towered aerodromes. A major benefit is the option for more aircraft to adopt straight-in approaches at all aerodromes. This delivers fuel saving and time savings to passengers and pilots. Other smaller benefits relate to reduced training time requirements and fuel saving benefits.

Operational costs are faced by some regional operators when departing an aerodrome in some directions. There are also some first year implementation costs to regulatory and service provision agencies.

The overall net benefit results for the NAS 2c Characteristic 29 are positive and substantial.

Over the next 10 years in NPV terms, implementing this change will generate net economic benefits of $32.2 million (see table below) with 90% confidence that the benefits are between $27.2 million to $39.1 million.

While NAS 2c generates an overall benefit to the economy, the costs and benefits are spread unevenly. For MBZ aerodromes retaining a requirement to carry and use radio and designated CTAF<*frequency*>(R), the central scenario indicates a small net cost (though this is not statistically significantly different from zero). However for the old CTAF aerodromes adopting the new US-style procedures, there is a considerable positive net benefit, and for Multicom aerodromes there is also a considerable positive net benefit.

Cost-benefit results table

	MBZ	Old CTAF	Multicom	Total
Benefits	$0.51m	$18.75m	$14.51m	$33.77m
Costs	$0.69m	$0.44m	$0.42m	$1.55m

Net Benefits	**-$0.18m**	**$18.31m**	**$14.09m**	**$32.22m**

Consultation

Consultation outline

The NASIG consulted extensively on safety issues in the lead-up to the production of an initial safety case to CASA, primarily through safety workshops in various cities. An initial Safety Case was prepared and submitted to CASA considering all these inputs.

CASA also published a formal Notice of Proposed Rulemaking (NPRM) which generated many responses.

As a result of its NPRM consultation processes, CASA decided the original Characteristic 29 proposal needed to be changed to address two CASA requirements.

The NASIG then incorporated the CASA requirements and ran two further safety workshops to ensure these changes could be safely implemented with Characteristic 29. No further problems were identified.

Since then NASIG has prepared an addendum to the Safety Case to cover the changes, and has conducted a further 22 information and feedback sessions with groups of pilots. NASIG has also consulted stakeholders on the suitability and timing of the planned training and eduction materials.

Initial Safety Case processes

The NASIG prepared a Safety Case on these changes and submitted it to CASA on 21 May 2004.

In the processes leading to the Safety Case report, NASIG consulted extensively on safety issues with focus groups of airspace stakeholders. In total 10 safety workshops were held in Brisbane, Melbourne, Sydney, Canberra, Perth, Darwin and Gold Coast leading up to the submission of the Safety Case to CASA. Workshops were also held for Defence.

Each issue or hazard identified at these workshops was summarised in the safety case report submitted to CASA, along with the suggested mitigators identified and the NASIG response.

CASA NPRM

CASA prepared and published a Notice of Proposed Rulemaking (NPRM) in January 2004. This NPRM generated a large number of responses from airspace stakeholders.

CASA received 1279 responses to the NPRM.

- 1170 responses supported the changes,
- 101 responses disagreed with some or all the changes, and
- 8 responses had no clear position on the changes.

As expected the responses from the different industry sectors were polarised.

- The general aviation, sports and recreational aviation associations, and over 1000 individuals supported the total NAS proposal as presented, therefore not needing detailed comment on particular aspects. This is an extraordinarily high response rate, and is due in large measure to CASA's innovative provision of a facility to enable convenient emailed responses to be submitted.
- ATC and pilot unions, airlines, charter operators, aerodrome operators and some individuals generally opposed the changes. Many of these provided detailed comments on specific aspects of the changes that they objected to.

CASA decision and Safety Case Addendum

As a result of its industry consultation, CASA decided that pilots will be required to carry and use radio when operating in the vicinity of some aerodromes. They further required pilots to carry and use radio when conducting a straight-in approach at any aerodrome.

NASIG conducted a further 2 safety workshops to check that the changed Characteristic 29 could be implemented safely. No further problems were found, and the two changes meant that Characteristic 29 would still largely harmonise with and capture most of the benefits of the US system.

NASIG then prepared an addendum to the original Safety Case to record the change and the additional analysis to ensure the amended Characteristic 29 could be implemented safely.

Training requirements consultation

NASIG consulted in the development of the draft training material for Stage 2c. This material was circulated among key airspace stakeholders who were further consulted on preferred content, presentation format and timing. CASA has also been consulted on the Training and Education material.

Regulatory consequence of CASA requirements

In order to meet the requirements CASA decided were necessary after the consultation process, some changes are now required to both CAR 166 and CAR 167.

These changes are necessary to implement the CASA radio carriage and use requirements. They were not part of the originally proposed amendment to CAR 166 that was the subject of the CASA NPRM and the initial NASIG consultation and analysis. They are however intended to meet the main concerns expressed primarily by regional airline pilots in the consultation process.

Conclusion

Preferred option	The introduction of Option 4: modified US procedures at all aerodromes would allow the introduction of US procedures with the exceptions that: • Carriage and use of radio will be required at some aerodromes, and • Only radio-equipped aircraft may conduct a straight-in approach at any aerodrome. This option largely harmonises with the US procedures, and captures most of the benefits of simplification and standardisation of procedures at all Australian non-towered aerodromes while meeting CASA's requirements and regional airline pilot's concerns.

Monitoring and review

Operational monitoring and review

The NASIG will monitor the operational safety of Characteristics 29 and 6 through the ATSB incident reporting system and the Airservices Australia incident reporting system. Any significant adverse trends will be addressed.

The NASIG expects that pilots or ATCs will quickly notify any significant safety problem because of the degree of consciousness of the changes within the aviation community. This will allow any operational safety issues to be addressed as soon as practical.

If, contrary to expectations, there an upward trend in incident rates is observed, then NASIG will:

- Institute further targeted training and education and other action (including consideration of enforcement action under CAR 166) to address the problem in conjunction with CASA and other stakeholders, and
- In conjunction with other agencies, assess the risk and if it is determined to be significantly increased, then take further action as necessary.

The NASIG will conduct a post-implementation review of the changes 3 months after implementation.

CTAF <*frequency*>(R) criteria

CASA and DOTARS have done some preliminary work towards developing criteria based on aircraft movements, density and mix etc to determine on a rational basis which aerodromes should be designated CTAF<*frequency*>(R).

This issue has proved to be more difficult than originally expected, and criteria were unable to be agreed in the Stage 2c timeframe. This issue has been deferred until the creation of the future Office of Airspace Management.

As an interim measure all aerodromes currently designated MBZ will be designated CTAF<*frequency*>(R).

Annex A Existing Regulations (CAR) 166 and 167

Annex B Proposed Regulations (CAR) 166, 166A, 167 and 322A

Annex C Benefit-Cost Analysis of Characteristic 29

ORR Ref 6020

Annex A

Existing Civil Aviation Regulations (CAR) 166 and 167

CIVIL AVIATION REGULATIONS 1988

Existing CAR 166
Operation on and in the vicinity of an aerodrome

(1) The pilot in command of an aircraft which is being operated on or in the vicinity of an aerodrome shall:

(a) observe other aerodrome traffic to avoid collision;

(b) conform with or avoid the pattern of traffic formed by other aircraft in operation;

(c) when approaching an aerodrome, other than a controlled aerodrome, for the purpose of landing, join the pattern of traffic in use for the landing direction in the up-wind, cross-wind or down-wind leg, as the case may be;

(d) make all turns to the left when approaching for a landing or after taking-off, if neither of the following applies:
(i) CASA has directed otherwise for a particular aerodrome;
(ii) air traffic control directs otherwise, either by radio, visual signal or signals displayed in the signal square;

(e) land and take-off, in so far as practicable, into the wind if air traffic control does not direct otherwise;

(f) before landing, descend in a straight line commencing at such a distance from the perimeter of an aerodrome as is common to the ordinary course of navigation for the aircraft type concerned, the commencement of that straight line not being nearer the perimeter of an aerodrome than 500 metres; and

(g) after take-off, not alter heading from the take-off heading at a height less than 500 feet above the terrain, if the alteration was not:
(i) directed by air traffic control; or
(ii) necessary due to the terrain.

Penalty: 25 penalty units.

(2) The provisions of paragraph (1) (c) do not apply to an aircraft conducting an instrument approach in I.M.C. if the instrument approach procedure requires the aircraft to join the pattern of traffic at any other point.

(3) The pilot in command of an aircraft that is being operated on or in the vicinity of an aerodrome shall not take the aircraft off from, or land the aircraft on, a part of the aerodrome outside the landing area of the aerodrome.

Penalty: 25 penalty units.

(4) An offence against subregulation (1) or (3) is an offence of strict liability.

Note For *strict liability*, see section 6.1 of the *Criminal Code*.

CIVIL AVIATION REGULATIONS 1988

Existing CAR 167
Procedure at controlled aerodromes

(1) If aerodrome control is in operation at an aerodrome, the pilot in command of an aircraft forming part of the aerodrome traffic shall:

(a) maintain a continuous listening watch on the radio frequency authorised for communications with aerodrome control service, or, if this is not possible, keep a watch for instructions which may be issued by visual signals; and

(b) obtain, either by radio or visual signals, prior authorisation for any manoeuvre preparatory to or associated with taxi-ing, landing or taking-off.

Penalty: 25 penalty units.

(2) An offence against subregulation (1) is an offence of strict liability.

Note For *strict liability*, see section 6.1 of the *Criminal Code*.

Annex B

Proposed Civil Aviation Regulations (CAR) 166, 166A, 167 and 322A

1 Name of Regulations

These Regulations are the *Civil Aviation Amendment Regulations 2005 (No.).*

2 Commencement

These Regulations commence on 24 November 2005.

3 Amendment of *Civil Aviation Regulations 1988*

Schedule 1 amends the Civil Aviation Regulations 1988.

Schedule 1 Amendments

(regulation 3)

[1] Subregulation 2 (1), after the definition of *night flight*

insert

non-controlled aerodrome means an aerodrome at which an air traffic control service is not operating.

Note A non-controlled aerodrome is also known as a non-towered aerodrome.

[2] Regulations 166 and 167

substitute

166 Operating in vicinity of a non-controlled aerodrome

(1) For this regulation and regulation 166A, an aircraft is ***in the vicinity of*** a non-controlled aerodrome if it is within:

(a) airspace other than controlled airspace; and

(b) a horizontal distance of 10 miles from the aerodrome; and

(c) a height above the aerodrome reference point of the aerodrome that could result in conflict with operations at the aerodrome.

(2) The pilot in command of an aircraft that is being operated in the vicinity of a non-controlled aerodrome must:

(a) maintain a look-out for other aerodrome traffic to avoid collision; and

(b) ensure that the aircraft does not cause a danger to other aircraft in the vicinity of the aerodrome; and

(c) conform with, or avoid, the circuit pattern; and

(d) unless subregulation (3) or (4) applies — when approaching the aerodrome to land, join the circuit pattern for the direction in which landing is to be undertaken on the upwind, crosswind or downwind leg; and

Note A circuit pattern has upwind, cross-wind, down-wind, base and final legs.

(e) after joining the circuit pattern for a landing or after taking off:

(i) if CASA has directed for the aerodrome that all turns be made in a particular direction — make all turns in compliance with CASA's directions; or

(ii) if subparagraph (i) does not apply and visual signals are displayed at the aerodrome indicating a direction to make all turns — make all turns in compliance with the visual signals; or

(iii) in any other case — make all turns to the left; and

(f) to the extent practicable, land and take off into the wind; and

(g) before landing, descend in a straight line starting at least 500 metres from the threshold of the landing runway and at a distance common to the ordinary course of navigation for the aircraft type; and

(h) after take-off, maintain the same track from the take-off until the aircraft is 500 feet above the terrain unless a change to the track is necessary for terrain avoidance.

Penalty: 25 penalty units.

(3) The pilot in command of an aircraft may carry out a straight-in approach to a non-controlled aerodrome only if:

(a) the aircraft is equipped with serviceable radio; and

(b) the pilot broadcasts the intention to do so on the VHF frequency in use at the aerodrome; and

(c) before starting the approach, the pilot determines wind direction and runways in use; and

(d) the pilot carries out all manoeuvring, to establish the aircraft on final approach, at least 5 miles from the threshold of the landing runway intended to be used; and

(e) the pilot gives way to any other aircraft established and flying in the circuit pattern at the aerodrome.

Penalty: 25 penalty units.

(4) The pilot in command of an aircraft may join the circuit pattern at a non-controlled aerodrome on the base leg, for the direction in which landing is to be undertaken, only if:

(a) CASA has given approval to do so; and

(b) details of the approval have been published in AIP.

Penalty: 25 penalty units.

(5) Paragraphs (2) (d) and (3) (b), (c) and (d) do not apply if:

(a) the pilot is conducting an instrument approach in I.M.C.; and

(b) the instrument approach procedure positions the aircraft to join the circuit other than on the upwind, cross-wind or down-wind leg of the circuit pattern.

(6) A pilot in command may operate an aircraft in the vicinity of an uncontrolled aerodrome that is designated under regulation 166A only if:

(a) the aircraft has a serviceable VHF radio; or

(b) the operation is authorised in writing by CASA.

Penalty: 25 penalty units.

(7) The pilot in command of an aircraft must not take the aircraft off from, or land the aircraft on, a part of a non-controlled aerodrome outside the landing area of the aerodrome.

Penalty: 25 penalty units.

(8) An offence against subregulation (2), (3), (4), (6) or (7) is an offence of strict liability.

166A Designation — carriage of radio

(1) CASA may designate a non-controlled aerodrome in the vicinity of which a serviceable aircraft VHF radio must be carried in aircraft.

(2) CASA must ensure that details of a designation under subregulation (1) are published in AIP or NOTAMS.

(3) A pilot in command of an aircraft that is operating in the vicinity of an aerodrome designated under subregulation (1) must broadcast on, and monitor, the VHF frequency in use for the aerodrome when inbound to land, before entering a runway and when in the vicinity of the aerodrome.

Penalty: 25 penalty units.

(4) An offence against subregulation (3) is an offence of strict liability.

(5) It is a defence to a prosecution under subregulation (4) if the defendant had a reasonable excuse.

Note A defendant bears an evidential burden in relation to the matter in subregulation (5) (see subsection 13.3 (3) of the *Criminal Code*).

167 Operation on or in the vicinity of a controlled aerodrome

(1) The pilot in command of an aircraft that is part of the aerodrome traffic at a controlled aerodrome must:

(a) maintain a lookout for other aerodrome traffic to avoid collision; and

(b) either:

(i) maintain a continuous listening watch on the radio frequency authorised for communications with aerodrome control service at the aerodrome; or

(ii) if that is not possible, keep a watch for any instructions given by visual signals; and

(c) obtain, either by radio or visual signals, prior authorisation from the air traffic control service for the aerodrome for any manoeuvre preparatory to, or associated with, taxiing, landing or taking off of the aircraft; and

(d) unless otherwise instructed by air traffic control:

(i) to the extent practical, land and take off into the wind; and

(ii) before landing, descend in a straight line starting at least 500 metres from the threshold of the landing runway and at a distance common to the ordinary course of navigation for the aircraft type; and

(iii) after take-off, maintain the same track from the take-off until the aircraft is 500 feet above the terrain unless a change to the track is necessary for terrain avoidance; and

(iv) make all turns to the left when approaching for a landing or after take-off.

Penalty: 25 penalty units.

(2) An offence against subregulation (1) is an offence of strict liability.

[3] After regulation 323

insert

323AA Transitional — certain directions under regulation 166

A direction issued by CASA in accordance with subparagraph 166 (1) (d) (i) as in force immediately before the commencement of this regulation has effect after the commencement as if it were a direction issued for subparagraph 166 (2) (e) (i) of CAR as in force on and from the commencement of this regulation.

Note

1. All legislative instruments and compilations are registered on the Federal Register of Legislative Instruments kept under the *Legislative Instruments Act 2003*. See www.frli.gov.au.

Annex C

Benefit-Cost Analysis of NAS Characteristic 29

Report Prepared by Access Economics Pty Ltd

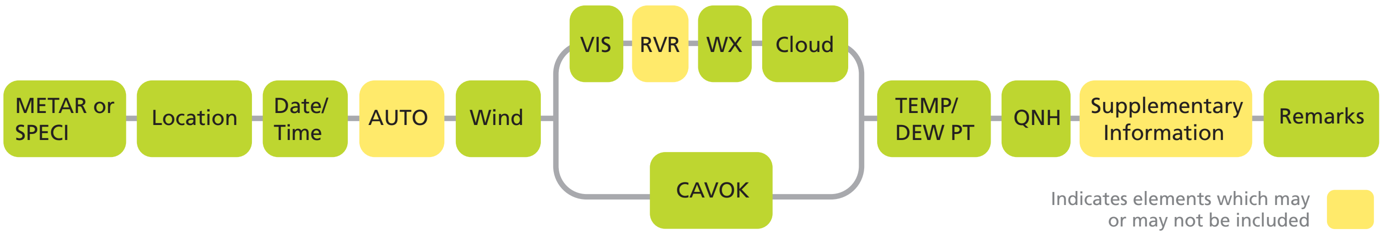
Attachment 5

> BUREAU OF METEOROLOGY
> WEATHER SERVICES
> AVIATION

Australian Government
Bureau of Meteorology

AVIATION WEATHER PRODUCTS

METAR/SPECI



METAR YPPH 221130Z 28012KT 8000 -RA FEW005 OVC110 27/22 Q0999 RERA RMK RF00.6/003.4

SPECI YSCB 171515Z AUTO 22015G25KT 9000NDV // NCD 13/09 Q1003 RMK RF00.8/003.0

METAR/SPECI

A METAR is a routine report of meteorological conditions at an aerodrome.

A SPECI is a special report of meteorological conditions, issued when one or more elements meet specified criteria significant to aviation. SPECI is also used to identify reports of observations recorded ten minutes following an improvement (in visibility, weather or cloud) to above SPECI conditions.

Location

The location is indicated by either the ICAO (International Civil Aviation Organization) location indicator or another approved abbreviation.

Date/Time

The day of month and the time of the report is given in UTC (Coordinated Universal Time) using six figures followed by the letter Z. The first two digits are the day of the month; the following 4 digits are the time in hours and minutes, e.g. 291741Z (time of report is 1741 on the 29th of the month UTC).

AUTO

The abbreviation AUTO will be included when the report contains only automated observations.

Surface Wind

The wind direction is given in degrees true, rounded to the nearest 10 degrees. A variable wind direction is given as VRB.

The wind speed, given in knots (KT), is the mean value over the sampling period which is normally ten minutes. The maximum wind speed during the sampling period is reported when it exceeds the mean speed by 10 knots or more. It is indicated by the letter G which is followed by the gust value, e.g. a wind direction of 280°, with a mean speed of 20 knots and a maximum gust of 31 knots, is given as 28020G31KT.

Visibility

The horizontal visibility is given in metres up to 9000 metres; with 9999 being used to indicate a visibility of 10 kilometres or greater.

When the visibility is estimated manually (i.e. by an observer), two groups may be reported when the visibility is not the same in different directions. In these cases, the higher visibility will be given first, followed by the minimum visibility and its direction (using one of the eight points of the compass) from the observing station e.g. 9000 2000N.

FURTHER INFORMATION
Aviation Weather Services
Visit us at www.bom.gov.au

When visibility is given by an automated sensor (in fully AUTOmated reports), only one group will be reported, and any variation in visibility that may exist will not be given.

Runway Visual Range (RVR)

RVR will be reported from aerodromes with RVR instrumentation whenever the RVR or the visibility are less than 1500 metres. It will be reported in the format **R**DD[n]/[n_1] $V_1V_1V_1V_1$ [**V** $n_2V_2V_2V_2V_2$]i (the elements in brackets are included only when applicable).

Code	Description
R	A fixed indicator, denoting that RVR information follows
DD	Designates runway threshold for which RVR is being reported
n	Parallel runways will be distinguished by the letter L, C or R indicating the left, centre or right runway, respectively
/	A fixed separator
n_1	n_1 will be given as **P** when either the RVR is either greater than the maximum value which can be assessed by the system (in which case VVVV will report this value), or when the RVR is greater than 2000 metres (in which case VVVV will be reported as 2000)
$V_1V_1V_1V_1$	Gives the last 10-minute average RVR value except when the RVR has varied significantly during the sampling period, in which case it gives the minimum one-minute average value during this period (and is followed by V $V_2V_2V_2V_2$).
V	A fixed indicator, included only when RVR has varied significantly during the sampling period.
n_2	n_2 will be given as **M** when either the RVR is either less than the minimum value which can be assessed by the system (in which case VVVV will report this value); or when the RVR is less than 50 metres (in which case VVVV will be reported as 0050).
$V_2V_2V_2V_2$	Gives the maximum one-minute average value during the sampling period. Is only included when the RVR has varied significantly during this period.
i	Gives any distinct tendency of the RVR over the sampling period - either U (upward), D (downward) or N (nil).

Code	Weather Descriptor
MI	shallow
BC	patches
PR	partial
DR	drifting
BL	blowing
SH	showers
FZ	freezing
TS	thunderstorm

Code	Weather Phenomena
DZ	drizzle
RA	rain
GR	hail
SN	snow
SG	snow grains
DU	dust
SA	sand
SS	sandstorm
DS	duststorm
GS	small hail/snow pellets
PL	ice pellets
FG	fog
BR	mist
FU	smoke
HZ	haze
PO	dust devil
SQ	squall
FC	funnel cloud
VA	volcanic ash
IC	ice crystals
PL	ice pellets

Weather

Weather phenomena are reported using the codes listed in the table on the left.

Intensity is indicated for precipitation, blowing dust/sand/snow, duststorm and sandstorm by appending:

- the prefix - for light, e.g. -DZ
- the prefix + for heavy, e.g. +RA
- no prefix for moderate, e.g. SHRA

When precipitation is reported with TS, the intensity indicator refers to the precipitation, e.g. -TSRA = thunderstorm with light rain.

Well-developed dust/sand whirls (dust devils) and funnel clouds are reported using the indicator +

One or more codes may be grouped, e.g. +TSGR, -TSRASN

An observation may provide an indication of weather in the vicinity of the aerodrome, i.e. between 8 and 16KM of the aerodrome reference point. In these cases, the weather code is prefixed with the abbreviation VC (vicinity), e.g. VCTS.

Cloud

Cloud information is reported from the lowest to the highest layers in accordance with the following rules:

- 1st group: the lowest layer regardless of amount.
- 2nd group: the next layer covering more than 2 oktas of the sky.
- 3rd group: the next higher layer covering more than 4 oktas of the sky.
- Extra groups: for cumulonimbus and/or towering cumulus clouds, whenever observed and

Code	Cloud Amount
SKC	sky clear
FEW	few (1 to 2 oktas)
SCT	scattered (3 to 4 oktas)
BKN	broken (5 to 7 oktas)
OVC	overcast (8 oktas)
NSC	nil significant cloud
NCD*	nil cloud detected

* NCD is reported (in fully automated reports only) when a cloud sensor detects nil cloud (a human observer will report SKC when the sky is clear).

Ceilometer
Copyright © Vaisala 1998-2009

Visibility sensor
Copyright © Vaisala 1998-2009

not reported in any of the above.

Cloud amount is described using the codes in the table on the left.

Cloud height is given as a three-figure group in hundreds of feet above the aerodrome elevation, e.g. cloud at 700 feet is shown as 007.

Cloud type is identified only for cumulonimbus and towering cumulus, e.g. FEW030CB, SCT045TCU.

When an individual layer is composed of cumulonimbus and towering cumulus with a common base, the cloud is reported as CB only.

If the sky is obscured, due to, for example, bushfire smoke, human observers will report the vertical visibility (when it can be estimated) in lieu of cloud. It is reported with the prefix VV followed by the vertical visibility in hundreds of feet, e.g. the group VV003 reports an estimated vertical visibility of between 300 and 399 feet (values are rounded down to the next hundred foot increment).

CAVOK

The abbreviation CAVOK (Cloud and Visibility OK) is used when the following conditions are observed simultaneously:

- Visibility is 10 kilometres or more;
- No cloud below 5000 feet or below the highest 25NM minimum sector altitude, whichever is the higher, and no cumulonimbus and no towering cumulus; and
- No weather of significance to aviation, i.e. none of the weather phenomena listed in the weather table.

Temperature

Air temperature and dew point values are rounded to the nearest whole degree. Negative values are indicated by M (minus) before the numeral, e.g. 34/M04

Pressure (QNH)

The QNH value is rounded down to the next whole hectopascal and is given using four figures prefixed by Q, e.g. 999.9 is given as Q0999

Supplementary Information

Supplementary information is used to report:

- Recent Weather - significant weather observed since the last report but not at the time of observation is given after the prefix RE, e.g. RERA.
- Wind Shear - reports of wind shear experienced on take-off or landing are given after the indicator WS, e.g. WS RWY16.

Remarks

The Remarks section (indicated by RMK) may contain the following:

- Quantitative information on past rainfall is given in millimeters in the form RFRR.R/RRR.R or RFRR.R/RRR.R/RRR.R. The former, e.g. RF00.2/004.2, gives the rainfall recorded in the ten minutes prior to the observation time, followed by the rainfall recorded in the period since 0900 local time. The second format, e.g. RF00.2/003.0/004.2, gives the rainfall recorded in the ten minutes prior to the observation, followed by the rainfall in the sixty minutes prior to the observation, followed by the rainfall recorded in the period since 0900 local time.
- Information of operational significance not reported in the body of the message, for example:
  - information about significant conditions (such as bushfires and distant thunderstorms) beyond the immediate vicinity of the aerodrome,
  - any BKN or OVC low or middle cloud present at or above 5000 feet when CAVOK has been included in the body of the message,
  - CLD:SKY MAY BE OBSC may be reported in fully automated reports when the ceilometer (cloud sensor) detects nil cloud and the visibility sensor estimates horizontal visibility as being less than 1000 metres

Data not available

Where a data group is not available, solidi will be reported in lieu of the missing group, e.g. //// for visibility, // for weather and ////// for cloud.

SPECI Criteria

SPECI is used to identify reports of observations when conditions are below specified levels of visibility and cloud base; when certain weather phenomena are present; and when temperature, pressure or wind change by defined amounts (outlined in the table on the right).

SPECI is also used to identify reports of observations recorded 10 minutes following an improvement in visibility, weather or cloud to METAR conditions.

Element	Criterion
Wind Direction	Changes of 30° or more, the mean speed before or after the change being 20KT or more
Wind Speed	Changes of 10KT or more, the mean speed before or after the change being 30KT or more
Wind Gust	• Gusts of 10KT or more above a mean speed of 15KT or more • Gust exceeds the last reported gust by 10KT or more
Visibility	When the horizontal visibility is below the aerodrome's highest alternate minimum visibility*
Weather	When any of the following begins, ends, changes in intensity, or is occuring at a routine reporting time: • thunderstorm • hailstorm • mixed snow and rain • freezing precipitation • drifting snow • fog (including shallow fog, fog patches and fog at a distance) • dust storm • sandstorm • squall • funnel cloud • moderate or heavy precipitation
Cloud	When there is BKN or OVC cloud below the aerodrome's highest alternate minimum cloud base*
Temperature	When the temperature changes by 5°C or more since last report
Pressure	When the QNH changes by 2hPa or more since last report

* Where no descent procedure is established for an aerodrome, the aerodrome's alternate ceiling and visibility are 1500 feet and 8 kilometres respectively.

METAR/SPECI Examples

METAR YPPH 221130Z 28012G23KT 9000 -SHRA FEW005 BKN050 27/22 Q0999 RETS RMK RF00.6/003.4 DISTANT TS

REPORT	EXPLANATION
METAR	Routine meteorological observation
YPPH	ICAO location indicator for Perth Airport
221130Z	Time of observation is 1130 on the 22nd of the month UTC
28012G23KT	Wind from the west (280 degrees True) at 12 knots; gusting to 23 knots
9000	Visibility is 9 kilometres.
-SHRA	Present weather is light rain shower
FEW005	There are 1 to 2 oktas of cloud with base at 500 feet
BKN050	There are also 5 to 7 oktas of cloud with base at 5000 feet
27/22	The air temperature is 27°C; the dewpoint temperature is 22°C
Q0999	The QNH is between 999 and 999.9 hectopascals
RETS	Recent weather was a thunderstorm
RMK	Remarks section follows
RF00.6/003.4	0.6 mm of rain has fallen in the last 10 minutes; 3.4 mm has fallen since 0900 local time
DISTANT TS	Distant thunderstorm (greater than 16 kilometres from the aerodrome reference point)

SPECI YSCB 171515Z AUTO 22015G25KT 9000 // NCD 13/09 Q1003 RMK RF00.8/003.0

REPORT	EXPLANATION
SPECI	Special meteorological observation (for wind gust)
YSCB	ICAO location indicator for Canberra Airport
171515Z	Time of observation is 1515 on the 17th of the month UTC
AUTO	This report is fully automated
22015G25KT	Wind from the southwest (220 degrees True) at 15 knots, gusting to 25 knots
9000	Visibility is 9000 metres (as measured by a visibility sensor)
//	Present weather is unavailable
NCD	Nil cloud has been detected (by ceilometer)
13/09	The air temperature is 13°C; the dewpoint temperature is 09°C
OVC110	There are also 8 oktas of cloud with base at 11 000 feet
Q1003	The QNH is between 1003 and 1003.9 hectopascals
RMK	Remarks section follows
RF00.8/003.0	0.8 mm of rain has fallen in the last 10 minutes; 3.0 mm has fallen since 0900 local time

SPECI YMML 221945Z 14004KT 0600 R16/0600D R27/0550N FG VV/// 08/08 Q1026 RMK RF000.0/001.8

REPORT	EXPLANATION
SPECI	Special meteorological observation (for wind gust)
YMML	ICAO location indicator for Melbourne Airport
221945	Time of observation is 1945 on the 22nd of the month UTC
14004KT	Wind is from the southeast (140 degrees True) at 4 knots
0600	Visibility is 600 metres
R16/0600D	Runway visual range on runway 16 threshold is 600 metres, and is trending down
R27/0550N	Runway visual range on runway 27 threshold is 550 metres, with nil trend
FG	Present weather is fog
VV///	The sky is obscured (by fog); the vertical visibility is unknown
08/08	The air temperature and the dewpoint temperature are both 8°C
OVC110	There are also 8 oktas of cloud with base at 11 000 feet
Q1026	TThe QNH is between 1026 and 1026.9 hectopascals
RMK	Remarks section follows
RF00.0/018.0	There has been nil rain in the last 10 minutes; 1.8 mm has fallen since 0900 local time

Australian Government
Bureau of Meteorology

Airservices Australia is the official distributor of aviation forecasts, warnings and observations issued by the Bureau of Meteorology. Flight briefing services are available at: **www.airservicesaustralia.com**. Telephone contact details for elaborative briefings are contained in Airservices' *Aeronautical Information Publication Australia* (AIP), which is available online through their website.

The Australian Bureau of Meteorology provides a wide range of observations, synoptic charts, satellite and radar images, forecast and warnings via the internet at **www.bom.gov.au**.

Attachment 6

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Australian Government
Civil Aviation Safety Authority

AVIATION SAFETY AUDIT REPORT
Organisation Name: Pel-Air Aviation P/L
Audit Reference: Pel-Air March 2008

Audit Report

Auditee Details

Organisation ARN:	227573
Organisation Name:	Pel-Air Aviation Pty Limited
Organisation Address:	81-83 Baxter Rd, Mascot, NSW, 2020. PO Box 807, Mascot, NSW, 1460.
Trading Name(s):	Pel-Air Aviation

Audit Details

Type:	Annual 870 Audit
Location(s):	81-83 Baxter Rd, Mascot, NSW
Dates (On Site):	12-13 March 2008
Audit Scope:	Operational Standards – CAR 217 Training & Checking

Audit Team

Lead Auditor/Auditor:	Mike Nolan	Flying Operations Inspector
Flying Operations	Felicia Lockley Jim Wallace	Flying Operations Inspector

Distribution

To:
s 47F [redacted] Pel-Air Aviation P/L
s 47F [redacted] Pel-Air Aviation P/L
Roger Weeks Regional Manager CASA SYDR
Mal Campbell Team Leader Flying Operations CASA SYDR

Confidential Document: *This Audit Report is a confidential document between the CASA and the Auditee (operator/certificate holder). CASA shall not disclose the contents of this report or part thereof, except in pursuance of its functions, with the express permission of the operator/certificate holder, or as required by law.*

Lead Auditor Signature:

Michael Nolan 9th May 2008

SENDER TO KEEP
RP38000140

SENDER TO KEEP
RP38000139

By Mail 9 May 2008
CEO & CHIEF PILOT

ASSP data ENTERED
Signed Date 25 5 08
Name Group RK

EXECUTIVE SUMMARY

Background

Pel-Air Aviation Pty Ltd (PEL) is a wholly owned subsidiary of Regional Express Holdings and holds AOC number 1-1VAV2-01 issued on the 23 October 2006. The AOC permits the conduct of Regular Public Transport (Cargo Only), Charter and Aerial Work operations in a fleet of 27 above 5700kg turbo prop and jet aircraft. Operations are conducted with 2 pilots (multi crew). The aircraft types include seven Westwind WW1124, two Westwind 1124A, four learjet L35/36, ten Metro III, four Metro 23, and one Brasilia EMB120 aircraft. These aircraft operate mainly from bases at Sydney, Darwin, Nowra, and Brisbane conducting night freight within Australia, and national and international medivac and passenger charter. Airwork operations consist of target towing for the Royal Australian Navy at Nowra NSW using Learjet and Weswind aircraft. The company has a current application with CASA to vary their AOC to operate SAAB 340 aircraft for both passenger and freight operations.

The company is staffed by approximately 120 employees which includes approximately 70 pilots all of whom are subject to the company's CASA approved CAR 217 training and checking organisation. The chief pilot is a CASA approved check pilot and CASA delegate (ATO) and is supported by another check pilot/ATO acting as the Head of Training and Checking. The company has a total of 8 check pilot/ATO delegates each approved to conduct instrument rating renewals of company pilots.

The company's main office is located at 81-83 Baxter Rd Mascot, NSW and houses the management committee, administrative officers, the chief pilot and head of training & checking staff. Other bases are located at Nowra and Brisbane. The company achieves approximately 17,000 revenue flying hours per annum.

The directors of Pel-Air Aviation Pty Ltd are:

s 47F

- [redacted] Chairman
- Director
- Director

The Management Committee is:

s 47F

- [redacted] Chairman & CEO
- Corporate Manager & Compliance Manager
- Engineering Manager
- Chief Pilot/Head of Flying Operations
- Technical Services Engineer
- Director
- Freight Operations Manager.
- Rex Represtitave

The management committee members are also on the 'Safety Management Committee' which convenes at separate monthly meetings to discuss operational specific safety matters.

Audit Summary

This audit of the company's CAR 217 training and checking organisation was conducted at the PEL Mascot office in accordance with the stated scope. The audit was scheduled as a result of the inability of the audit team to complete an effective audit of the CAR 217 organisation in October 2007 due to the poor response of the majority of PEL pilots, and check pilot/ATOs to the request from PEL management for the provision of their logbooks. PEL Management accepted CASA's advice of a need to terminate the October 2007 audit and schedule a second audit when all pilots had responded to a subsequent request for the provision of logbooks. This second audit of the CAR 217 training and checking organisation, as reported in this document, was conducted in March 2008.

Access to all staff, facilities and records was made available to the audit team. The CEO, Chief Operating Officer, Chief Pilot, Head of Training and Checking and Compliance Manager were available throughout the audit which commenced with an entry meeting on Tuesday 12th March 2008. Advice was given to PEL management by the audit team during the first day of the audit that there was no record of FRMS training of flight crew. PEL acknowledged this finding and CASA issued a Safety Alert on the same day. The lead auditor also provided advice to the PEL CEO of other non-compliances on the 17 March 2008. In light of this advice during the audit, the lead auditor determined that these events had overtaken the need for a formal exit meeting.

Management Organisation

The audit determined that the company has adequately identified the infrastructure required under the *Civil Aviation Act (1988)* and has an appropriate management organisation and chain of command in place. The organisational structure, as stated in the OPSM Part A1.1.1. will be amended to reflect the appointment of s 47F [redacted] to the position of CEO and the appointment of s 47F [redacted] to the board of Rex Holdings effective April 2008.

CAR 217 Training and Checking Organisation - Fatigue Risk Management System(FRMS)

The company's Fatigue Risk Management System (FRMS) was approved by CASA on the 30th April 2007. Operations conducted under this FRMS require training for all flight crews prior to them being rostered for operational duty. The audit of the CAR 217 organisation's flight crew training records revealed that while flight crews had been operating under the FRMS for 11 months, the FRMS training required had not been conducted. This non-compliance was considered to represent an immediate threat to the safety of operations and CASA issued a 'Safety Alert' on the 12th March 2008 which required operations conducted under the FRMS to cease and operations to be conducted in accordance with CAO48. The company accepted CASA's decision and advised CASA on the 17th March 2008 that the required training had been completed. CASA responded on the 18th March 2008 by issuing approval for the company to resume operations in accordance with the FRMS.

Audit Summary cont.....

Audit of 20 flight crew training records revealed that approximately 80% contained no evidence of training in Emergency Procedures Training - Life Jackets and Life Rafts or Human Factors Management Training. The company was advised on the 17 March 2008 of this breach of CAR 215 (9) and the CEO responded on the 20 March 2008 advising that the training would be conducted and completed within a week. The CEO also advised that the company had reviewed its training requirements as stated in the OPSM with regard to Controlled Flight Into Terrain (CFIT), Enhanced Ground Proximity Warning Systems (EGPWS), and Crew Resource Management (CRM) and that all pilots would complete appropriate training within 1 week.

Audit of the flight crew training records and log books revealed that renewal of instrument ratings of two (2) line pilot's by a company check pilot/ATO were not conducted in accordance with the requirements of CAO 40.2.1. This involved approach aids being entered on the renewal form and pilot log book that were not flown during the flight test. The ATO had stated that he had incorrectly interpreted a recent change to the legislation. The Lead Auditor discussed this matter with the Head of Training and Checking, and it was revealed that PEL does conduct any regular 'standardisation meetings' or other 'procedural training' with it's check pilot/ATO delegates.

<u>Management System Model (MSM) Summary</u>
The following is a brief summary of the analysis of the MSM highlighting any significant conclusions on the performance of the organisation in the areas covered by the audit against the four attributes, Management Responsibility, Infrastructure, Processes, and Monitoring and Improvement.

Management Responsibility
Review of the structure of the organisation established that the management have appointed appropriately trained and qualified persons to match the positions stated in the PEL OPSM Part A1.1.1 Operations Structure, and as a result have demonstrated their compliance to meet their responsibilities under the *Civil Aviation Act1988*. Commitment and Planning is demonstrated by the 'Management Committee' meeting monthly and the reports produced from these monthly meetings being given to the board.

Infrastructure
With regard to the provision of data and information, the audit revealed that the Compliance Manager and his team have been active in producing OPSM manuals to support the company's operations within the relevant aviation legislation. An electronic version of the company's operations manual suite is available to approved persons within CASA via the PEL company intranet.

Audit Summary cont.....

Process in Practice

The findings of the systems audit and the product surveillance conducted since the issue of the AOC in October 2006 has demonstrated that while the senior management and staff have appropriate documented procedures available, the failure to detect the deficiencies in the training and checking organisation with regard to the FRMS, CRM, Wet Drills, EGPWS training and the conduct of instrument rating renewals not in accordance with the legislation demonstrates that appropriate practices are not being conducted. Given the experience and competency of the staff, this finding suggests inadequate resources are available within the CAR 217 training and checking organisation and the company's system of internal audit.

Monitoring and Improvement

From the deficiencies found in the flight crew training records it is evident that internal audit is not an integral part of the day to day flying operations in that it does not review operational documents such as Flight Crew Training Records. Deficiencies in the document control and internal audit system were also discussed during the October 2007 audit and elaborated in an audit observation 712599 issued in October 2007 (*Attached at the end of this report).*

Conclusion & Recommendation

Recommendation to Pel-Air Aviation P/L

Given the fact that the company provide training and checking for 70 pilots it is important in the interest of operational safety for PEL management to resolve the issues stated in this report and establish more effective and frequent internal audit of the conduct and recording of the training and checking of flight crew. Given the number of pilots currently employed and the company's proposed expansion into the SAAB 340 aircraft, a review of the current workload of the Chief Pilot and Head of Training and Checking's should also be considered.

INDEX OF FINDINGS

Number	Legislation	System / Element	FOI	Type
317098	*Civil Aviation Act 28BE*, CAR 215, CAO 48	Operational Standards – Crew Scheduling	Mal Campbell	*RCA*
317099	CAR 215 (9), CAR 217	Operational Personnel – CRM Training	Mike Nolan	*RCA*
317100	CAR 282(4)(b) ; CAO 82.0 Appx 1 para 2.2(f)	Operational Standards – Instrument Rating Renewals	Jim Wallace	*RCA*
317101	CAR 215 (9), CAR 217	Operational Personnel – EGPWS Training	Mike Nolan	*RCA*
317102	CAR 215, CAR217,CAO20.11	Operational Standards – Wet Drills Training	Mike Nolan	*RCA*
713236		AOC Operations	Mal Campbell	*AO*

Conduct

The audit team:

- Interviewed the Head of Training and Checking
- Reviewed the Company OPSM, and
- Audited approximately 20 flight crew training records and log books by cross-checking the entries of training and proficiency checking performed during the previous 12 month period.

Evaluation

Part G. Fatigue Risk Management System (FRMS). The FRMS contained in the company operations manual (OPSM) was approved by CASA instrument EX17/07 signed on the 30th April 2007. Operations conducted under this instrument required FRMS training for all flight crews. In the CASA audit conducted in October 2007, the audit team discussed the usability and effectiveness of the FRMS manual with the Compliance Manager and the PEL rostering staff. The audit sampling determined that the system was operating to a satisfactory standard. The March 2008 audit of the flight crew training records maintained as part of the CAR217 training and checking organisation revealed that the FRMS training of flight crews as required in Part 6 the company FRMS manual had not been conducted. The non-compliance was considered as an immediate threat to the safety of operations and CASA issued a 'Safety Alert' on the 12th March 2008 which required operations conducted under the FRMS to cease and to be conducted in accordance with CAO48. The company accepted CASA's decision and advised CASA on the 17th march 2008 that the required training had been completed. CASA responded on the 18th March 2008 by issuing approval for the company to resume operations in accordance with the FRMS. Refer RCA 317098 which is attached and was issued on the 12th March 2008.

Part D-2 2.2.2 Human Factors Management Training. The OPSM states that all company pilots shall complete an initial and recurrent CRM course as per Annex 12 and 13 every 15 months. Part D-2 Annex 12 contains a list of topics titled 'CRM Induction' to be done as an induction course. Part D-2 Annex 13 has a list of topics which form the re-current training. Of the 20 pilot flight crew training records audited no evidence found that any of this training had being conducted since 2001. Refer RCA 317099.

Part D- 2. Annex 11. Enhanced Ground Proximity Warning Systems (EGPWS). The OPSM states that the training has been implemented for operational crews of aircraft equipped with EGPWS. Of the 20 pilot training records audited no evidence was found of any training being conducted since 2001. Refer RCA 317101.

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Pel-Air Aviation P/L March 2008

AUDIT FLIGHT CREW RECORDS

Pilot Name: [redacted]
ARN:
Medical Valid to:

Training Record
- **Induction Completed:**
- **GPS Training D2 annex1** no record on file
- **EGPWS Training D2 Annex 11** no record on file
- **CRM Induction D2 Annex 12** no record on file
- **FRMS Training Manual Part G 6 Training and Resources** no record on file
- **Ansett Flight Simulator Instructors/Check Pilots D2 Annex 14** [redacted] grade 1 instructor
- **Low Flying Training D2 Annex 6** no record on file
- **Aircraft Performance Training Part D 5** 12/01/08
- **Syllabus of Training Check Pilots D6** no record on file

Endorsement Aircraft Type: Metro 3/ simulator
Endorsement Command or Co-pilot: Command
Endorsement Date: 09/02/08
Sticky Label entered Yes/No: Yes
Endorsing Pilot Name/ARN: [redacted]
Total Hours Flown:
- **Dual** 21.7
- **Solo/Command/ICUS:**
- **Day** 20
- **Night** 1.7
- **Cleared to line:** 22/02/08. No training records for line training and not stated in log book as a line check.

Instrument Rating Date: 28/11/07
Aircraft Type: Can not tell aircraft type as only 1 page of log book provided.
Command or Co-Pilot: Command
Aircraft Type: Insufficient log book pages supplied
Hours Flown: Insufficient log book pages supplied
Nav Aids Tested: NDB,VOR,ILS,LLZ,DGA
Nav Aids Entered on Sticky label: Yes
Day or Night: Insufficient log book pages supplied
Last CAO 20.11Check: 08/02/07 I believe this is in error and should be 2008
Check Pilot Name: [redacted]
Wet Drills Completed Date:
Dangerous goods: 5 Dec 2007 exp 5 Dec 2009
CAR 217 Proficiency Check Date: 2/2/08
Aircraft Type: Simulator (metro)
Check Pilot Name /ARN: [redacted]
Previous CCAR 217 check Date: new employee

Remarks: Pilot only supplied log book pages for Jan and Feb 2008, which appears to be from when [redacted] joined Pel-Air. The training records are lacking any line training records.
Ansett simulator engineering examination results on file, Metro dated 12 Jan 2008, 95%
Endorsement 25 to 31 Jan 2007, 20 hours simulator, 8 to 9 Feb 2007, 1.7 hours aircraft

Part D-2 2.2.1 Emergency Procedures Training - Life Jackets and Life Rafts. The OPSM states that for initial qualification with the company each pilot shall demonstrate his/her competency in the use of the lifejacket in the water, and for initial qualification with the company, each pilot shall demonstrate in the water his/her competency in the deployment, inflation, boarding and passenger control procedures for the typical life raft carried on board. There is also a requirement for re-current training. Of the 20 flight crew training records audited the results provided evidence that neither the initial or re-current training had been conducted for most pilots. Refer RCA 317102.

Conduct of Instrument Rating Renewals. Product Surveillance conducted on the 26 and 27 February 2008 of a PEL training and checking function by Check Pilot/ATO [redacted] and Check Pilot applicant [redacted] resulted in confusion regarding the requirement to renew the NDB component of a instrument rating. This may have resulted in renewals being conducted with the NDB being renewed on the basis of a renewal of the VOR. Refer Audit Observation 713236

Flight Crew Training Record (FCTR). Audit of the FCTR of [redacted] produced evidence that his instrument rating was renewed 20/03/07 and on the basis of a flight where an NDB and ILS approach was tested, his GNSS (RNAV) was renewed. Audit of the FCTR of [redacted] produced evidence that a VOR renewal was issued on the basis of a flight 27/10/07 on which no VOR; ILS or LLZ was flown. This was corrected 7/11/07 where an ILS was flown but without supporting Flight Test Form or Test Number. Refer RCA 317100

Flight Crew Training Records Audited. Audit of 20 flight crew training records revealed that approximately 80% contained no evidence of the conduct of required training. Attached below are the CASA auditor reports for individual flight crew. Of particular concern is the number of findings that state "No record on File".

Pel-Air Aviation P/L March 2008
AUDIT FLIGHT CREW RECORDS

Pilot Name:	s 47F [redacted]
ARN:	
Medical Valid to:	
Training Record	
• **Induction Completed:**	no record on file
• **GPS Training D2 annex1**	no record on file
• **EGPWS Training D2 Annex 11**	no record on file
• **CRM Induction D2 Annex 12**	record on file **not** dated
• **FRMS Training**	record for FMS not FRMS **not** dated
• **Ansett Flight Simulator Instructors/Check Pilots D2 Annex 14**	no record on file
• **Low Flying Training D2 Annex 6**	no record on file
• **Aircraft Performance Training Part D 5**	no record on file
• **Syllabus of Training Check Pilots D6**	no record on file
• **CFIT**	record on file **not** dated
Endorsement Aircraft Type:	Metro 3
Endorsement Command or Co-pilot:	Command
Endorsement Date:	25 April 2007
Sticky Label entered Yes/No:	Yes
Endorsing Pilot Name/ARN:	s 47F [redacted]
Total Hours Flown:	5.0
• **Dual**	5.0
• **Solo/Command/ICUS:**	ICUS 120.8
• **Day**	2.7
• **Night**	118.1
• **Cleared to line:**	11 July 2007
Instrument Rating Date:	26 Apr 2007
Aircraft Type:	Metro 3
Command or Co-Pilot:	Command
Aircraft Type:	Metro 3
Hours Flown:	1.8
Nav Aids Tested:	NDB,ILS
Nav Aids Entered on Sticky label:	NDB,ILS,LLZ,VOR,DGA
Day or Night:	Log book only supplied for July 2007
Last CAO 20.11Check:	26 Apr 2007
Check Pilot Name:	s 47F [redacted]
Wet Drills Completed Date :	no record on file
Dangerous goods:	Valid to 01 June 2008
CAR 217 Proficiency Check Date:	11 July 2007
Aircraft Type:	Metro
Check Pilot Name /ARN:	s 47F [redacted]
Previous CCAR 217 check Date:	12 Dec 2006

Remarks: CP has checked the training records. Where information is missing the CP has marked in red. No evidence of follow up action/s recorded.

Pel-Air Aviation P/L March 2008
AUDIT FLIGHT CREW RECORDS

Pilot Name: [redacted]
ARN:
Medical Valid to:
Training Record

- **Induction Completed:** No record on file
- **GPS Training D2 annex1** no record on file
- **EGPWS Training D2 Annex 11** no record on file
- **CRM Induction D2 Annex 12** 14 Aug 2001
- **FRMS Training** 13 August 2001 NB this is FMS **not** FRMS
- **Ansett Flight Simulator Instructors/Check Pilots D2 Annex 14** no record on file
- **Low Flying Training D2 Annex 6** no record on file
- **Aircraft Performance Training Part D 5** no record on file
- **Syllabus of Training Check Pilots D6** no record on file
- **CFIT awareness** 4 Aug 2001

Endorsement Aircraft Type: Metro 3 and E120
Endorsement Command or Co-pilot: Command
Endorsement Date: Not evident from available files
Sticky Label entered Yes/No: Page from log book not supplied
Endorsing Pilot Name/ARN: no record on file
Total Hours Flown: no record on file

- **Dual**
- **Solo/Command/ICUS:**
- **Day**
- **Night**
- **Cleared to line:**

Instrument Rating Date: 29 Apr 2007
Aircraft Type: Metro 3
Command or Co-Pilot: Command
Aircraft Type: Metro 3
Hours Flown: 1.9
Nav Aids Tested: NDB,VOR,LLZ,ILS
Nav Aids Entered on Sticky label: ILS,LLZ,VOR,NDB,DGA
Day or Night: Day

Last CAO 20.11Check: 20 Sep 2007
Check Pilot Name: [redacted]
Wet Drills Completed Date: no evidence on file
Dangerous goods: 29 April 2009
CAR 217 Proficiency Check Date: 07 Sep 2007
Aircraft Type: E120
Check Pilot Name /ARN: [redacted]
Previous CCAR 217 check Date: 29 Apr 2007

Remarks: No training records for endorsement training. This [redacted] on both Metro and E120. Although there is a divider (approvals/delegations/certificates) in the training records document there is only 1 check pilot approval and this is for Pel-Air express, dated 18 April 2006. A check should be made to ensure this pilot has current approvals.

Pel-Air Aviation P/L March 2008
AUDIT FLIGHT CREW RECORDS

Pilot Name: [redacted]
ARN:
Medical Valid to:

Training Record

- **Induction Completed:** no record on file
- **GPS Training D2 annex1** no record on file
- **EGPWS Training D2 Annex 11** no record on file
- **CRM Induction D2 Annex 12** no record on file
- **FRMS Training** no record on file
- **Ansett Flight Simulator Instructors/Check Pilots D2 Annex 14** no record on file
- **Low Flying Training D2 Annex 6** no record on file
- **Aircraft Performance Training Part D 5** only record for flight planning and weight and balance
- **Syllabus of Training Check Pilots D6** no record on file
- **Dangerous goods exp:** 21 Sept 2009

Endorsement Aircraft Type: Metro 3
Endorsement Command or Co-pilot: Command
Endorsement Date: 20 Aug 2007
Sticky Label entered Yes/No: Yes
Endorsing Pilot Name/ARN: [redacted]
Total Hours Flown: 8.3 hours

- **Dual** 8.3 hours
- **Solo/Command/ICUS:**
- **Day** 7.6
- **Night** 0.7
- **Cleared to line:** 14 Sep 2007

Instrument Rating Date: 06 August 2007
Aircraft Type: unable to tell from log book pages provided as may be before employment commenced.
Command or Co-Pilot: Command
Aircraft Type: insufficient pages of log book supplied
Hours Flown: insufficient log book pages supplied
Nav Aids Tested: no information available
Nav Aids Entered on Sticky label: NDB,ILS,LLZ,VOR,DGA
Day or Night: insufficient log book pages supplied
Last CAO 20.11Check: 17 Aug 2007
Check Pilot Name: [redacted]
Wet Drills no record on file.
CAR 217 Proficiency Check Date: 14 Sept 2007
Aircraft Type: Metro 3
Check Pilot Name /ARN: [redacted]
Previous CCAR 217 check Date:
Remarks: Chief pilot has marked information that is missing in red pen on some of the training files. What is the procedure for follow up? Some written comments on training file very difficult to read.

Pel-Air Aviation P/L March 2008
AUDIT FLIGHT CREW RECORDS

Pilot Name:
ARN:
Medical Valid to: s 47F [redacted]

Training Record

- **Induction Completed:** no record on file
- **GPS Training D2 annex1** no record on file
- **EGPWS Training D2 Annex 11** no record on file
- **CRM Induction D2 Annex 12** no record on file
- **FRMS Training** no record on file
- **Ansett Flight Simulator Instructors/Check Pilots D2 Annex 14** no record
- **Low Flying Training D2 Annex 6** no record on file
- **Aircraft Performance Training Part D 5** no record on file
- **Syllabus of Training Check Pilots D6** no record on file

Endorsement Aircraft Type: Westwind
Endorsement Command or Co-pilot: Command
Endorsement Date: 25/11/07
Sticky Label entered Yes/No: Yes
Endorsing Pilot Name/ARN: s 47F [redacted]
Total Hours Flown: 5hours 10 mins

- **Dual** 5hrs 10mins
- **Solo/Command/ICUS:** N/A
- **Day** 3hrs 25mins
- **Night** 1hr 45mins
- **Cleared to line:** 28/01/08

Instrument Rating Date: 06/09/07
Aircraft Type: insufficient log book pages to determine type, CIR renewed prior to employment with Pel-Air
Command or Co-Pilot: command
Aircraft Type: insufficient log book pages supplied
Hours Flown: insufficient log book pages supplied
Nav Aids Tested: NDB,VOR,ILS,LLZ,GPS/DME arrival
Nav Aids Entered on Sticky label: yes
Day or Night: insufficient info supplied

Last CAO 20.11Check: 25.11.07
Check Pilot Name: s 47F [redacted]
Wet Drills Completed Date): no record on file
Dangerous goods expiry: 04/09/09
CAR 217 Proficiency Check Date: 28/01/08
Aircraft Type: Westwind
Check Pilot Name /ARN: s 47F [redacted]
Previous CCAR 217 check Date: new employee

Remarks:

Pel-Air Aviation P/L March 2008
AUDIT FLIGHT CREW RECORDS

Pilot Name: s 47F [redacted]
ARN:
Medical Valid to:

Training Record — Examination results on file **not** dated

- **Induction Completed:** no record on file
- **GPS Training D2 annex1** no record on file
- **EGPWS Training D2 Annex 11** no record on file
- **CRM Induction D2 Annex 12** no record on file
- **FRMS Training** no record on file
- **Ansett Flight Simulator Instructors/Check Pilots D2 Annex 14** no record on file
- **Low Flying Training D2 Annex 6** no record on file
- **Aircraft Performance Training Part D 5** no record on file
- **Syllabus of Training Check Pilots D6** no record on file

Endorsement Aircraft Type: Westwind
Endorsement Command or Co-pilot: Co-pilot
Endorsement Date: 24 Mar 2005
Sticky Label entered Yes/No: Yes
Endorsing Pilot Name/ARN: s 47F [redacted]
Total Hours Flown: no record on file

- **Dual**
- **Solo/Command/ICUS:**
- **Day**
- **Night**
- **Cleared to line:**

Instrument Rating Date: 31 March 2008
Aircraft Type: Westwind
Command or Co-Pilot: Co-pilot
Aircraft Type: Westwind
Hours Flown: 1.7
Nav Aids Tested: NDB,ILS
Nav Aids Entered on Sticky label: NDB,VOR,ILS,LLZ
Day or Night: Day

Last CAO 20.11Check: 11 Nov 2007
Check Pilot Name: s 47F [redacted]
Wet Drills Completed Date: 24 Jan 2007
Dangerous goods expiry: 17 July 2009
CAR 217 Proficiency Check Date: 11 Nov 2007
Aircraft Type: Westwind
Check Pilot Name /ARN: s 47F [redacted]
Previous CCAR 217 check Date: 02 March 2007

Remarks: No endorsement training records or line training records. Westwind examination on file not dated. Pilot maintenance authority found in file signed off by s 47F [redacted] 5/8/05

Pel-Air Aviation P/L March 2008
AUDIT FLIGHT CREW RECORDS

Pilot Name: [redacted]
ARN:
Medical Valid to:

Training Record

- **Induction Completed:** no record on file
- **GPS Training D2 annex1** no record on file
- **EGPWS Training D2 Annex 11** no record on file
- **CRM Induction D2 Annex 12** no record on file
- **FRMS Training** no record on file
- **Ansett Flight Simulator Instructors/Check Pilots D2 Annex 14** no record on file
- **Low Flying Training D2 Annex 6** no record on file
- **Aircraft Performance Training Part D 5** no record on file
- **Syllabus of Training Check Pilots D6** no record on file

Endorsement Aircraft Type: Westwind
Endorsement Command or Co-pilot: Command
Endorsement Date: 09 July 2006
Sticky Label entered Yes/No: Yes
Endorsing Pilot Name/ARN: Name not on label [redacted]
Total Hours Flown: No training records of endorsement

- **Dual**
- **Solo/Command/ICUS:**
- **Day**
- **Night**
- **Cleared to line:**

Instrument Rating Date: 30 Sep 2008
Aircraft Type: Westwind
Command or Co-Pilot: Command
Aircraft Type: Westwind
Hours Flown: 1.8
Nav Aids Tested: NDB,ILS
Nav Aids Entered on Sticky label: Sticky label not in log book copy. Last log book sticky label for CIR expired 30 Sep 2006
Day or Night: Day

Last CAO 20.11Check: 13 July 2007
Check Pilot Name: [redacted]
Wet Drills Completed Date
Dangerous goods expiry: 24 July 09
CAR 217 Proficiency Check Date: 27 Oct 2007
Aircraft Type: Westwind
Check Pilot Name /ARN: [redacted]
Previous CCAR 217 check Date: 13 July 2007

Remarks: [redacted] was command endorsed in 2006. He did his command upgrade training in mid 2007. He has completed training as a supervisory pilot. This training has been documented.

Pel-Air Aviation P/L March 2008
AUDIT FLIGHT CREW RECORDS

Pilot Name: s 47F [redacted]
ARN:
Medical Valid to:

Training Record

- **Induction Completed:** No record
- **GPS Training D2 annex1** No record
- **EGPWS Training D2 Annex 11** (Undated) CFIT Course
- **CRM Induction D2 Annex 12** (Undated)
- **FRMS Training** (Undated) Fatigue Management Course
- **Ansett Flight Simulator Instructors/Check Pilots D2 Annex 14**
- **Low Flying Training D2 Annex 6**
- **Aircraft Performance Training Part D 5**
- **Syllabus of Training Check Pilots D6**

Endorsement Aircraft Type:	**Metro 3 :**	**Brasilia**
Endorsement Command or Co-pilot: C/P	**Command**	
Endorsement Date:	**24/10/2006**	**30/01/2008**
Sticky Label entered Yes/No:	**Yes**	**YES**
Endorsing Pilot Name/ARN:	s 47F [redacted]	
Total Hours Flown:		
• **Dual**	**4.5**	**9.7**
• **Solo/Command/ICUS:**		
• **Day**	**3.4**	**8.8**
• **Night**	**1.1**	**0.7**
• **Cleared to line:**	**22-23/03/2007**	

Instrument Rating Date:	**24/10/2007**
Aircraft Type:	**Metro 3**
Command or Co-Pilot:	**Command**
Aircraft Type:	
Hours Flown:	**1.9**
Nav Aids Tested:	**VOR; ILS**
Nav Aids Entered on Sticky label:	**NDB; VOR; ILS; LLZ; DGA**
Day or Night:	

Last CAO 20.11Check:	**C227(24/10/07) E120(30/01/08)**
Check Pilot Name:	s 47F [redacted]
Wet Drills Completed Date :	

CAR 217 Proficiency Check Date:
Aircraft Type:
Check Pilot Name /ARN:
Previous CCAR 217 check Date:

Remarks:
NDB issued without flight test.
Raft/Jacket drills signed off for both A/C on 20:11 check
System of Maintenance for E120 dated 9/01/08✓
D.G Certificate valid to 24/09/2008✓\
Exam Critique for E120 & Conversion Ground training Form✓

Pel-Air Aviation P/L March 2008
AUDIT FLIGHT CREW RECORDS

Pilot Name:	s 47F [redacted]
ARN:	
Medical Valid to:	

Training Record

• Induction Completed:	11/04/2007? See comment
• GPS Training D2 annex1	No Records
• EGPWS Training D2 Annex 11 No Records	
• CRM Induction D2 Annex 12	No Records
• FRMS Training	No Records
• Ansett Flight Simulator Instructors/Check Pilots D2 Annex 14	
• Low Flying Training D2 Annex 6	
• Aircraft Performance Training Part D 5	
• Syllabus of Training Check Pilots D6	

Endorsement Aircraft Type:	C227
Endorsement Command or Co-pilot:	Command
Endorsement Date:	03/02/2006
Sticky Label entered Yes/No:	Yes
Endorsing Pilot Name/ARN:	s 47F [redacted]
Total Hours Flown:	
• Dual	No Records
• Solo/Command/ICUS:	
• Day	No Records
• Night	No Records
• Cleared to line:	25/07/2007

Instrument Rating Date:	01/03/2007
Aircraft Type:	BE76
Command or Co-Pilot:	Command
Aircraft Type:	
Hours Flown:	1.5
Nav Aids Tested:	No Records
Nav Aids Entered on Sticky label:	NDB; ILS; LLZ; VOR; DGA
Day or Night:	

Last CAO 20.11Check:	16/04/2007
Check Pilot Name:	s 47F [redacted]
Wet Drills Completed Date	No wet drill records
CAR 217 Proficiency Check Date:	14/12/2007
Aircraft Type:	Metro
Check Pilot Name /ARN:	s 47F [redacted]
Previous CCAR 217 check Date:	

Remarks:
DG valid to 02/05/2009✓
Supervisory pilot✓

Pel-Air Aviation P/L March 2008
AUDIT FLIGHT CREW RECORDS

Pilot Name: s 47F [redacted]
ARN:
Medical Valid to:

Training Record

- **Induction Completed:** No record
- **GPS Training D2 annex1** No record
- **EGPWS Training D2 Annex 11** No record
- **CRM Induction D2 Annex 12** No record
- **FRMS Training** No record
- **Ansett Flight Simulator Instructors/Check Pilots D2 Annex 14**
- **Low Flying Training D2 Annex 6**
- **Aircraft Performance Training Part D 5**
- **Syllabus of Training Check Pilots D6**

Endorsement Aircraft Type: 1124 WESTWIND
Endorsement Command or Co-pilot: Command
Endorsement Date: 18/12/2007
Sticky Label entered Yes/No: Yes
Total Hours Flown:

- **Dual** 5.1
- **Solo/Command/ICUS:**
- **Day** 3.5
- **Night** 1.6
- **Cleared to line:** 06/01/2008

Instrument Rating Date: 03/01/2008
Aircraft Type: BE76
Command or Co-Pilot: Command
Aircraft Type:
Hours Flown: 1.1
Nav Aids Tested: NDB; ILS
Nav Aids Entered on Sticky label: NDB; VOR;ILS; LLZ; DGA
Day or Night:

Last CAO 20.11Check: 16/01/2008
Check Pilot Name: s 47F [redacted]
Wet Drills Completed Date (If pilot does CHARTER):

CAR 217 Proficiency Check Date: 16/01/2008
Aircraft Type: 1124
Check Pilot Name /ARN: s 47F [redacted]
Previous CCAR 217 check Date:

Remarks:
Life raft/jacket ticked on 20:11
Engineering exam 1124✓
DG valid to 07/07/2009✓

Pel-Air Aviation P/L March 2008
AUDIT FLIGHT CREW RECORDS

Pilot Name: s 47F [redacted]
ARN:
Medical Valid to:

Training Record
- Induction Completed: No records
- GPS Training D2 annex1 No records
- EGPWS Training D2 Annex 11 No records
- CRM Induction D2 Annex 12 No records
- FRMS Training No records
- Ansett Flight Simulator Instructors/Check Pilots D2 Annex 14
- Low Flying Training D2 Annex 6
- Aircraft Performance Training Part D 5
- Syllabus of Training Check Pilots D6

Endorsement Aircraft Type: CO-PILOT METRO 3
Endorsement Command or Co-pilot:
Endorsement Date: 04/04/2007
Sticky Label entered Yes/No: Yes
Endorsing Pilot Name/ARN: s 47F [redacted]
Total Hours Flown:
- Dual 5.3
- Solo/Command/ICUS:
- Day No records
- Night No records
- Cleared to line: 27/06/2007

Instrument Rating Date: 27/10/2007
Aircraft Type: Metro 23
Command or Co-Pilot: Co-Pilot
Aircraft Type:
Hours Flown: 1.5
Nav Aids Tested: NDB; GNSS;
Nav Aids Entered on Sticky label: NDB; GNSS; DGA; VOR (See comment)
Day or Night:

Last CAO 20.11Check: 27/10/2007
Check Pilot Name: s 47F [redacted]
Wet Drills Completed Date
CAR 217 Proficiency Check Date: 27/10/2007
Aircraft Type: Metro 23
Check Pilot Name /ARN:
Previous CCAR 217 check Date:

Remarks:
VOR renewed without VOR or ILS/LLZ being flown.
Pilot supplied LBE entry shows ILS; LLZ; VOR done on the 07/11/2007 with no supporting documentation.
Cleared to line 27/06/07 but PA 1 doesn't indicate type; rego or flight time

Pel-Air Aviation P/L March 2008
AUDIT FLIGHT CREW RECORDS

Pilot Name: [redacted]
ARN:
Medical Valid to:

Training Record
- Induction Completed: No record
- GPS Training D2 annex1 No record
- EGPWS Training D2 Annex 11 No record
- CRM Induction D2 Annex 12 No record
- FRMS Training No record
- Ansett Flight Simulator Instructors/Check Pilots D2 Annex 14
- Low Flying Training D2 Annex 6
- Aircraft Performance Training Part D 5
- Syllabus of Training Check Pilots D6

Endorsement Aircraft Type: Metro
Endorsement Command or Co-pilot: Command
Endorsement Date: 07/10/2002
Sticky Label entered Yes/No: Yes
Total Hours Flown:
- Dual
- Solo/Command/ICUS:
- Day
- Night
- Cleared to line: 27/12/07

Instrument Rating Date: 30/11/2007 [redacted]
Aircraft Type: No record
Command or Co-Pilot: Command
Aircraft Type: No record
Hours Flown: No record
Nav Aids Tested: No record
Nav Aids Entered on Sticky label: ILS; LLZ; VOR; NDB
Day or Night: No record

Last CAO 20.11Check: 03/12/2007
Check Pilot Name: [redacted]
Wet Drills Completed Date (If pilot does CHARTER):

CAR 217 Proficiency Check Date: Return after long absence
Aircraft Type:
Check Pilot Name /ARN:
Previous CCAR 217 check Date:

Remarks:
DG valid to 02/12/2009✓

Pel-Air Aviation P/L March 2008
AUDIT FLIGHT CREW RECORDS

Pilot Name: [redacted]
ARN:
Medical Valid to:

Training Record

- **Induction Completed:**
- **GPS Training D2 annex1** No Records
- **EGPWS Training D2 Annex 11 No Records**
- **CRM Induction D2 Annex 12** No Records
- **FRMS Training** No Records
- **Ansett Flight Simulator Instructors/Check Pilots D2 Annex 14**
- **Low Flying Training D2 Annex 6**
- **Aircraft Performance Training Part D 5**
- **Syllabus of Training Check Pilots D6**

Endorsement Aircraft Type: Metro 3
Endorsement Command or Co-pilot: Co-Pilot
Endorsement Date: 01/08/2007
Sticky Label entered Yes/No: Yes
Endorsing Pilot Name/ARN: [redacted]
Total Hours Flown:

- **Dual** 7.9
- **Solo/Command/ICUS:**
- **Day** 6.8
- **Night** 1.1
- **Cleared to line:** 09/11/07?

Instrument Rating Date: 29/11/2007
Aircraft Type: Metro
Command or Co-Pilot: Co-Pilot
Aircraft Type:
Hours Flown: 1.6
Nav Aids Tested: NDB; ILS
Nav Aids Entered on Sticky label: NDB;VOR;ILS;LLZ;DGA
Day or Night: 3.5 (See comment)

Last CAO 20.11Check: 24/07/2007
Check Pilot Name: [redacted]
Wet Drills Completed Date (If pilot does CHARTER):

CAR 217 Proficiency Check Date: 09/11/2007
Aircraft Type: Metro
Check Pilot Name /ARN: [redacted]
Previous CCAR 217 check Date:

Remarks:
Logbook shows 0.5hr I/F with item 28 (Steep turns) not tested during renewal CIR
DG valid to 12/11/2009✓
Jacket drill checked off on 20:11.

Pel-Air Aviation P/L March 2008
AUDIT FLIGHT CREW RECORDS

Pilot Name: s 47F [redacted]
ARN:
Medical Valid to:

Training Record
- Induction Completed: No records
- GPS Training D2 annex1 No records
- EGPWS Training D2 Annex 11 CFIT (Corporate Air)
- CRM Induction D2 Annex 12 No records
- FRMS Training No records
- Ansett Flight Simulator Instructors/Check Pilots D2 Annex 14
- Low Flying Training D2 Annex 6
- Aircraft Performance Training Part D 5
- Syllabus of Training Check Pilots D6

Endorsement Aircraft Type: No records
Endorsement Command or Co-pilot: Command
Endorsement Date: No records
Sticky Label entered Yes/No: ` 09/05/2005
Endorsing Pilot Name/ARN:
Total Hours Flown:
- Dual No records
- Solo/Command/ICUS:
- Day No records
- Night No records
- Cleared to line: Line Check 27/10/2007

Instrument Rating Date: 20/03/07
Aircraft Type: Metro 23
Command or Co-Pilot: Command
Aircraft Type:
Hours Flown: 3.1
Nav Aids Tested: NDB; ILS; GNSS
Nav Aids Entered on Sticky label: NDB; VOR; LLZ; ILS; DGA; GNSS
Day or Night:
Last CAO 20.11Check: 20/03/2007
Check Pilot Name: s 47F [redacted]
Wet Drills Completed Date
CAR 217 Proficiency Check Date: 27/10/2007
Aircraft Type: Metro 23
Check Pilot Name /ARN: s 47F [redacted]
Previous CCAR 217 check Date:

Remarks:
No copy of LBE Form to confirm in crew file
Pilot supplied LBE shows NDB; VOR; LLZ; ILS; DGA; GNSS
Note; Unsigned licence
No DG Certification

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Pel-Air Aviation P/L March 2008
AUDIT FLIGHT CREW RECORDS

s 47F

Pilot Name:	[redacted]
ARN:	
Medical Valid to:	

Training Record

- Induction Completed: 22/02/2007 (See comment)
- GPS Training D2 annex1 No Records
- EGPWS Training D2 Annex 11 No Records
- CRM Induction D2 Annex 12 No Records
- FRMS Training No Records
- Ansett Flight Simulator Instructors/Check Pilots D2 Annex 14
- Low Flying Training D2 Annex 6
- Aircraft Performance Training Part D 5
- Syllabus of Training Check Pilots D6

Endorsement Aircraft Type:	
Endorsement Command or Co-pilot:	Command
Endorsement Date:	26/07/2007
Sticky Label entered Yes/No:	Yes
Endorsing Pilot Name/ARN:	s 47F [redacted]
Total Hours Flown:	
• Dual	No Records
• Solo/Command/ICUS:	No Records
• Day	No Records
• Night	No Records
• Cleared to line:	27/02/07

Instrument Rating Date:	31/07/2007?
Aircraft Type:	No Records
Command or Co-Pilot:	Command
Aircraft Type:	Metro 3
Hours Flown:	2.5
Nav Aids Tested:	VOR/ILS
Nav Aids Entered on Sticky label:	NDB; VOR; ILS; LLZ; DGA
Day or Night:	No Records

Last CAO 20.11Check:	31/07/2007
Check Pilot Name:	s 47F [redacted]
Wet Drills Completed Date :	Waived

CAR 217 Proficiency Check Date:	31/07/2007
Aircraft Type:	Metro 3
Check Pilot Name /ARN:	s 47F [redacted]
Previous CCAR 217 check Date:	

Remarks:
Recommended for Line Check but document unsigned by recommender signature.
CIR renewed and NDB endorsed without flight check of NDB
No DG Certification

Australian Government
Civil Aviation Safety Authority

AVIATION SAFETY AUDIT REPORT
Organisation Name: Pel-Air Aviation P/L
Audit Reference: Pel-Air March 2008

Pel-Air Aviation P/L March 2008
AUDIT FLIGHT CREW RECORDS

Pilot Name: [redacted]
ARN:
Medical Valid to:

Training Record
- Induction Completed: No record
- GPS Training D2 annex1 No record
- EGPWS Training D2 Annex 11 (Undated) CFIT
- CRM Induction D2 Annex 12 (Undated) CRM
- FRMS Training (Undated) Fatigue Management Course
- Ansett Flight Simulator Instructors/Check Pilots D2 Annex 14
- Low Flying Training D2 Annex 6
- Aircraft Performance Training Part D 5
- Syllabus of Training Check Pilots D6

Endorsement Aircraft Type: Metro 3
Endorsement Command or Co-pilot: Command
Endorsement Date: 02/10/2006
Sticky Label entered Yes/No: Yes
Total Hours Flown:
- Dual 5.3
- Solo/Command/ICUS:
- Day 5.0
- Night 0.3
- Cleared to line: 07/12/2006 [Re-cleared 03/07/2007]

Instrument Rating Date: 03/07/2007
Aircraft Type:
Command or Co-Pilot: Command
Aircraft Type: Metro
Hours Flown: 1.8
Nav Aids Tested: NDB; ILS
Nav Aids Entered on Sticky label: NDB; VOR; ILS; LLZ; DGA
Day or Night:

Last CAO 20.11Check: 03/07/2007
Check Pilot Name: [redacted]
Wet Drills Completed Date (If pilot does CHARTER):

CAR 217 Proficiency Check Date: 03/07/2007
Aircraft Type: Metro
Check Pilot Name /ARN: [redacted]
Previous CCAR 217 check Date: 06-07/12/2006

Remarks:
Incomplete test check form so "Publications up to Date?" not ticked along with others.
DG valid to 22/06/2009✓

Pel-Air Aviation P/L March 2008
AUDIT FLIGHT CREW RECORDS

Pilot Name: s 47F [redacted]
ARN:
Medical Valid to:

Training Record
- Induction Completed: No records
- GPS Training D2 annex1 No records
- EGPWS Training D2 Annex 11 No records
- CRM Induction D2 Annex 12 No records
- FRMS Training No records
- Ansett Flight Simulator Instructors/Check Pilots D2 Annex 14
- Low Flying Training D2 Annex 6
- Aircraft Performance Training Part D 5
- Syllabus of Training Check Pilots D6

Endorsement Aircraft Type:
Endorsement Command or Co-pilot: Command
Endorsement Date: 18/11/2007
Sticky Label entered Yes/No:
Total Hours Flown:
- Dual 5.0
- Solo/Command/ICUS:
- Day 3.5
- Night 1.5
- Cleared to line: 07/12/2007

Instrument Rating Date: 30/08/2007
Aircraft Type: No records
Command or Co-Pilot: Command
Aircraft Type: No records
Hours Flown: No records
Nav Aids Tested: No records
Nav Aids Entered on Sticky label: NDB; ILS; LLZ; VOR; DGA
Day or Night:

Last CAO 20.11Check: 11/12/2007
Check Pilot Name: s 47F [redacted]
Wet Drills Completed Date (If pilot does CHARTER):

CAR 217 Proficiency Check Date: 11/12/2007
Aircraft Type: 1124
Check Pilot Name /ARN: s 47F [redacted]
Previous CCAR 217 check Date:

Remarks:
1124 Engineering Exam✓
No DG Certification
20:11 (11/12/2007) items not all checked off.

Pel-Air Aviation P/L March 2008
AUDIT FLIGHT CREW RECORDS

Pilot Name: [redacted]
ARN:
Medical Valid to:

Training Record
- Induction Completed: No record
- GPS Training D2 annex1 25/03/2006 [redacted]
- EGPWS Training D2 Annex 11 No record
- CRM Induction D2 Annex 12 No record
- FRMS Training No record
- Ansett Flight Simulator Instructors/Check Pilots D2 Annex 14
- Low Flying Training D2 Annex 6
- Aircraft Performance Training Part D 5
- Syllabus of Training Check Pilots D6/

Endorsement Aircraft Type:
Endorsement Command or Co-pilot: Command
Endorsement Date: 23/10/2007
Sticky Label entered Yes/No: Yes
Endorsing Pilot Name/ARN: [redacted]
Total Hours Flown:
- Dual 6.6
- Solo/Command/ICUS:
- Day 4.2
- Night 1.6
- Cleared to line: 23/11/2007

Instrument Rating Date: 17/09/07 valid to 30/09/2007
Aircraft Type: Unknown
Command or Co-Pilot: Command
Aircraft Type: Unknown
Hours Flown: Unknown
Nav Aids Tested: Unknown
Nav Aids Entered on Sticky label: NDB; VOR; ILS; LLZ; DGA
Day or Night:
Last CAO 20.11Check: 22/10/2007
Check Pilot Name: [redacted]
Wet Drills Completed Date : Waived

CAR 217 Proficiency Check Date: 23/11/2007
Aircraft Type: Metro 3
Check Pilot Name /ARN: [redacted]
Previous CCAR 217 check Date:

Remarks:
Proficiency, Check to Line and Base signed off on the same day (same flight?) by [redacted] 23/11/07.
Wet drill training has been waived on Pel-Air checklists
No CIR test form to confirm hours; aids etc.
No records of commencement of employment date
No DG Certificate

Pel-Air Aviation P/L March 2008
AUDIT FLIGHT CREW RECORDS

s 47F [redacted]

Pilot Name:
ARN:
Medical Valid to:

Training Record
- Induction Completed:
- GPS Training D2 annex1
- EGPWS Training D2 Annex 11
- CRM Induction D2 Annex 12
- FRMS Training
- Ansett Flight Simulator Instructors/Check Pilots D2 Annex 14
- Low Flying Training D2 Annex 6
- Aircraft Performance Training Part D 5
- Syllabus of Training Check Pilots D6

Endorsement Aircraft Type:
Endorsement Command or Co-pilot:
Endorsement Date:
Sticky Label entered Yes/No:
Endorsing Pilot Name/ARN:
Total Hours Flown:
- Dual
- Solo/Command/ICUS:
- Day
- Night
- Cleared to line:

Instrument Rating Date: 27/08/2007
Aircraft Type: metro 3
Command or Co-Pilot: 2.2
Nav Aids Tested: VOR and LLZ
Nav Aids Entered on Sticky label:
Day or Night:

Last CAO 20.11Check: 2 Feb 2008
Check Pilot Name: s 47F [redacted]
Wet Drills Completed Date (If pilot does CHARTER):
Dangerous Goods: 20 Feb 2009
CAR 217 Proficiency Check Date: 27 Aug 2007
Aircraft Type: Metro 3
Check Pilot Name /ARN: s 47F [redacted]
Previous CCAR 217 check Date: 30April 2007

Remarks:
NDB RENEWED WITHOUT BEING FLOWN. ATO s 47F [redacted] who has left company.

Evidence of CRM,.FMS, CFIT training in 2001

Pel-Air Aviation P/L March 2008
AUDIT FLIGHT CREW RECORDS

Pilot Name: s 47F [redacted]
ARN:
Medical Valid to:

Training Record
- Induction Completed:
- GPS Training D2 annex1
- EGPWS Training D2 Annex 11
- CRM Induction D2 Annex 12
- FRMS Training
- Ansett Flight Simulator Instructors/Check Pilots D2 Annex 14
- Low Flying Training D2 Annex 6
- Aircraft Performance Training Part D 5
- Syllabus of Training Check Pilots D6

Endorsement Aircraft Type:
Endorsement Command or Co-pilot:
Endorsement Date:
Sticky Label entered Yes/No:
Endorsing Pilot Name/ARN:
Total Hours Flown:
- Dual
- Solo/Command/ICUS:
- Day
- Night
- Cleared to line:

Instrument Rating Date: 29 April 2007
Aircraft Type: Metro 3
Command or Co-Pilot: Command
Hours Flown: 1.9
Nav Aids Tested: NDB, VOR, ILS, ILS, LLZ
Nav Aids Entered on Sticky label:
Day or Night:
Last CAO 20.11Check: 29 April 2008
Check Pilot Name: s 47F [redacted]
Wet Drills Completed Date (If pilot does CHARTER):
Dangerous Goods: 29 April 2009
CAR 217 Proficiency Check Date: 7 Sept 2007
Aircraft Type:
Check Pilot Name /ARN: s 47F [redacted]
Previous CCAR 217 check Date: 29 April 2007

Remarks:

Pel-Air Aviation P/L March 2008
AUDIT FLIGHT CREW RECORDS

Pilot Name: [redacted]
ARN:
Medical Valid to:

Training Record
- **Induction Completed:**
- **GPS Training D2 annex1**
- **EGPWS Training D2 Annex 11**
- **CRM Induction D2 Annex 12**
- **FRMS Training**
- **Ansett Flight Simulator Instructors/Check Pilots D2 Annex 14**
- **Low Flying Training D2 Annex 6**
- **Aircraft Performance Training Part D 5**
- **Syllabus of Training Check Pilots D6**

Endorsement Aircraft Type: **Metro 3**
Endorsement Command or Co-pilot:
Endorsement Date:
Sticky Label entered Yes/No:
Endorsing Pilot Name/ARN:
Total Hours Flown:
- **Dual**
- **Solo/Command/ICUS:**
- **Day**
- **Night**
- **Cleared to line:**

Instrument Rating Date: **30 Nov 2008**
Aircraft Type:
Command or Co-Pilot:
Hours Flown:
Nav Aids Tested:
Nav Aids Entered on Sticky label: **ILS, LLZ, VOR, NDB**
Day or Night:

Last CAO 20.11Check: **03/Dec 2007**
Check Pilot Name: [redacted]
Wet Drills Completed Date (If pilot does CHARTER):
Dangerous Goods: **02 Dec 2009**

CAR 217 Proficiency Check Date: **27 Dec 2007**
Aircraft Type: **Metro 3**
Check Pilot Name /ARN: [redacted]

Remarks: Training file contained a Training Summary of hours flown sectors flown training captain, inst approaches, hours day, night, instrument flight.

Line training form PEL 3001 from 24 Dec 2007 to 3 Dec 2007. Some forms are not completed in accordance with the instructions issued to all check pilots by the HOTC. Audit Observation.

Pel-Air Aviation P/L March 2008
AUDIT FLIGHT CREW RECORDS

[redacted]

Pilot Name:
ARN:
Medical Valid to:

Training Record
- Induction Completed:
- GPS Training D2 annex1
- EGPWS Training D2 Annex 11
- CRM Induction D2 Annex 12
- FRMS Training
- Ansett Flight Simulator Instructors/Check Pilots D2 Annex 14
- Low Flying Training D2 Annex 6
- Aircraft Performance Training Part D 5
- Syllabus of Training Check Pilots D6

Endorsement Aircraft Type:
Endorsement Command or Co-pilot:
Endorsement Date:
Sticky Label entered Yes/No:
Endorsing Pilot Name/ARN:
Total Hours Flown:
- Dual
- Solo/Command/ICUS:
- Day
- Night
- Cleared to line:

Instrument Rating Date:	19 June 2007
Aircraft Type:	Metro 3
Command or Co-Pilot:	Command
Hours Flown:	1.2
Nav Aids Tested:	NDB, ILS
Nav Aids Entered on Sticky label:	
Day or Night:	

Last CAO 20.11Check:	
Check Pilot Name:	
Wet Drills Completed Date	
Dangerous Goods:	05 July 2009
CAR 217 Proficiency Check Date:	05 Nov 2007
Aircraft Type:	Metro 3
Check Pilot Name /ARN:	[redacted]
Previous CCAR 217 check Date:	02 April 2007

Remarks:

AUDITEE INSTRUCTIONS

Authority for the conduct of the audit
The audit identified in this report was carried out by CASA in pursuance of its functions under section 9 of the Civil Aviation Act 1988.

Confidentiality
This audit report is a confidential document between the CASA and the operator/certificate holder. CASA will not disclose this report or any part of it to any third person except, in pursuance of its functions, with the express permission of the operator/certificate holder, or as required by law.

Audit Method
The audit is a sampling exercise and does not purport to be a total systems review. The sampling provides a snapshot of the system and any deficiencies detected could point to a systemic problem, requiring a total systems review by the operator. The operator/certificate holder as outlined below must address deficiencies and problems identified in the audit findings.

Audit Findings
Audit findings may be in the form of Requests for Corrective Action (RCA), Safety Alerts (SA) or Audit Observations (AO).

RCA (Request for Corrective Action)
RCAs detail deficiencies that involve non-compliance with legislation and must be addressed. The deficiency is described in the 'details of deficiency' field. For RCAs, the following actions must be taken to address the deficiency/deficiencies:
Remedial action: to remedy the immediate situation so that operations are brought within safe parameters; for example: the REMEDIAL ACTION to address an identified deficiency of 'cabin crew not currently trained in emergency procedures' would be to conduct training for all affected staff.
Investigative action: to identify the deficiency/problem and determine the root cause;
Corrective action(s) to address the root cause of the problem; for example The CORRECTIVE ACTION would be to document and implement a system for training, recording, reporting and warning of pending expiry dates for all initial and recurrent training
The certificate holder must record both the remedial and corrective action taken on the 'recipient's response' page of the RCA and return it to the address shown, by the due date. Where the corrective action cannot be completed by the due date, the certificate holder must indicate the date by which the corrective action will be completed. (Note: To avoid unnecessary pages in this report, only one copy of the 'recipient's response' page is included at the end. Please photocopy as required).

Safety Alerts
A SAFETY ALERT is a particular type of REQUEST FOR CORRECTIVE ACTION that must be addressed IMMEDIATELY. As the holder of the certificate, licence, CASA approval or authority, the certificate holder must take action to ensure that the deficiency is rectified carrying out RCA steps 2) and 3) above:
a) before the continued operation of the aircraft concerned; or
b) before continuing any activity carried out under the certificate or licence or approval or authority held by you that is the subject of the deficiency.

Audit Observations
An Auditor raises an AUDIT OBSERVATION to draw attention to latent conditions or minor deficiencies in a system that cannot be attributed to a current legislative requirement. The intention is to raise awareness with a view to avoiding problems in the future. Response to OBSERVATIONS is not required. However, Auditee's would be well advised to take appropriate action as part of their continuous improvement processes. Actions taken may be covered in future surveillance.

Note: A copy of all Safety Alerts (SA), Request for Corrective Actions (RCA), Audit Observations (AO) and Aircraft Survey Reports(ASR) are attached

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ASSP data ENTERED
Signed: Date: 22 5 08
Name: Office: BK

Australian Government
Civil Aviation Safety Authority

AVIATION SAFETY AUDIT REPORT

Organisation Name: Pel-Air Aviation P/L

Audit Reference: Pel-Air March 2008

Request for Corrective Action

Organisation Name:	Pel-Air Aviation Pty Ltd 30534		
ARN:	227573	**RCA No:**	317099
Contact Address:	PO Box 807, Mascot, NSW	**Postcode:**	1460.
Regulatory Reference:	Civil Aviation Regulation 215 (9), CAR 217 (1), (3).		
Audit Element:	Operational Standards – CAR 217 Training & Checking – Crew Resource Management		

Note: *Issue of a Request for Corrective Action (RCA) does not in any way prejudice CASA's prerogative to take at any time such regulatory or other legal action as may be appropriate in the circumstances.*

Details of Deficiency:

Part D-2 2.2.2 Human Factors Management Training of the OPSM states that all company pilots shall complete an initial and recurrent CRM course as per Annex 12 and 13 every 15 months. Part D-2 Annex 12 contains a list of topics titled 'CRM Induction' to be done as an induction course. Part D-2 Annex 13 has a list of topics which form the re-current training. Of the 20 pilot flight crew training records audited no evidence found that any of this training being conducted since 2001.

Criteria:

Civil Aviation Regulation CAR 215 (9) states that each member of the operations personnel of an operator shall comply with all instructions contained in the operations manual in so far as they relate to his or her duties or activities.

Civil Aviation Regulation CAR 217 (1) states that "An operator of a regular public transport service, an operator of any aircraft the maximum take-off weight of which exceeds 5700kilograms and any other operator that CASA specifies shall provide a training and checking organisation so as to ensure that members of the operator's operating crews maintain their competency".

CAR 217(3) states that "The training and checking organisation and its tests and checks provided for therein shall be subject to approval of CASA".

Date Issued: 9 / 5 / 08

Response Due: 6 / 6 / 08

CASA Office Address:

Is this RCA linked to a Safety Alert?

☐ Yes ☒ No

Components as causal factors: (Select only one)

☐ 1 – Management Commitment	☐ 7 – Personnel
☐ 2 – Planning	☒ 8 – Process in Practice
☐ 3 – Management Review	☐ 9 – Internal Audit
☐ 4 – Facility	☐ 10 – Internal Reporting
☐ 5 – Tools, Equipment and Materials	☐ 11 – Investigation
☐ 6 – Data, Information & Records	☐ 12 – Remedial, Corrective and Preventive Action

Printed Name: Mike Nolan Date: 9 / 5 / 08

CASA Office Use Only
File:______ Folio:______ Data Entry:______ Area office:______
Printed Name:______ Date Entered: ___/___/___
Signature:______

Australian Government
Civil Aviation Safety Authority

AVIATION SAFETY AUDIT REPORT
Organisation Name: Pel-Air Aviation P/L
Audit Reference: Pel-Air March 2008

Request for Corrective Action

Name: Pel-Air Aviation Pty Ltd
ARN: 227573
Contact Address: PO Box 807, Mascot, NSW 1460

RCA Number: 317099

Corrective Action: *This section to be completed by the recipient or by his/her representative and forwarded to the above office by the response due date shown on Page 1 of this request.*

Remedial Action: ***(Action taken to fix the immediate effects of the identified deficiency):***

Root Cause(s) Identified: ***(what was the root cause of the identified deficiency)***

Corrective Action: ***(Action taken to address the root cause of the deficiency to ensure the deficiency does not recur):***

.... Date: __/___/_

Recipient's or Representative's Signature **Printed Name**

CASA Office Address: PO Box CP 57 Condell Park 2200

CASA Office Use Only

Verification of Action:

CASA Representative Acceptance:

Signed: ____________ Name: ____________ Date: ___/______/______

RCA/s on File: ____________ Folio: ____________ Associated Papers: ____________

362

ASSP data ENTERED
Signed: Date: 22/5/08
Name: Office: BJL

Australian Government
Civil Aviation Safety Authority

Organisation Name:	Pel-Air Aviation Pty Ltd		317532
ARN:	227573	**RCA No:**	317100
Contact Address:	PO Box 807, Mascot, NSW	**Postcode:**	1460
Regulatory Reference:	CAR 282(4)(b) ; CAO 82.0 Appendix 1 para 2.2(f)		
Audit Element:	Operational Standards – CAR 217 Training & Checking		

Note: *Issue of a Request for Corrective Action (RCA) does not in any way prejudice CASA's prerogative to take at any time such regulatory or other legal action as may be appropriate in the circumstances.*

Details of Deficiency:

s 47F [redacted] was issued a renewal 20/03/07 of GNSS on the basis of a flight where an NDB and ILS solely were tested.

s 47F [redacted] was issued VOR on the basis of a flight 27/10/07 on which no VOR, ILS or LLZ was flown.

Criteria:

CAO 82.0 reads in paragraph 2.2 Responsibilities of Chief Pilot - (f) monitoring operational standards, maintaining training records and supervising the training and checking of flight crew of the operator;

CAR 282 (4) b) issue a certificate that he or she is required or empowered under these Regulations without ensuring that all matters therein are true and correct in every material particular.

Date Issued: 9 May 08

Response Due: 6 June 08

CASA Office Address:

Is this RCA linked to a Safety Alert?

☐ Yes ☒ No

Components as causal factors: (Select only one)

☐ 1 – Management Commitment
☐ 2 – Planning
☐ 3 – Management Review
☐ 4 – Facility
☐ 5 – Tools, Equipment and Materials
☐ 6 – Data, Information & Records
☐ 7 – Personnel
☒ 8 – Process in Practice
☐ 9 – Internal Audit
☐ 10 – Internal Reporting
☐ 11 – Investigation
☐ 12 – Remedial, Corrective and Preventive Action

.... James Frederick Wallace 9/5/08. Date ~~13/03/08~~

CASA Office Use Only
File:________ Folio:________ Data Entry:________ Area office:________
Printed Name:________ Date Entered: ___/___/___
Signature:________

Australian Government
Civil Aviation Safety Authority

AVIATION SAFETY AUDIT REPORT

Organisation Name: Pel-Air Aviation P/L

Audit Reference: Pel-Air March 2008

Name: Pel-Air Aviation Pty Ltd
ARN: 227573
Contact Address: PO Box 807, Mascot, NSW, 1460

RCA Number: 317100

Corrective Action: *This section to be completed by the recipient or by his/her representative and forwarded to the above office by the response due date shown on Page 1 of this request.*

Remedial Action: ***(Action taken to fix the immediate effects of the identified deficiency):***

Root Cause(s) Identified: ***(what was the root cause of the identified deficiency)***

Corrective Action: ***(Action taken to address the root cause of the deficiency to ensure the deficiency does not recur):***

.... Date: __/___/_

Recipient's or Representative's Signature **Printed Name**

CASA Office Address: PO Box CP 57 Condell Park 2200

CASA Office Use Only
Verification of Action:

CASA Representative Acceptance:
Signed: ________ Name: ________ Date: __/___/___
RCA/s on File: ________ Folio: ________ Associated Papers: ________

360

ENTERED

Signed: Date: 22 8 08

Australian Government
Civil Aviation Safety Authority

AVIATION SAFETY AUDIT REPORT

Organisation Name: Pel-Air Aviation P/L

Audit Reference: Pel-Air March 2008

Request for Corrective Action

Organisation Name:	Pel-Air Aviation Pty Ltd 31DS33		
ARN:	227573	**RCARef #:**	317101
Contact Address:	PO Box 807 Mascot	**Postcode:**	1460.
Regulatory Reference:	Civil Aviation Regulation 217, CAR 215 (9), CAO 82.0.		
Audit Element:	Operational Standards – CAR 217 Training & Checking Organisation		

Note: *Issue of a Request for Corrective Action (RCA) does not in any way prejudice CASA's prerogative to take at any time such regulatory or other legal action as may be appropriate in the circumstances.*

Details of Deficiency:

The OPSM states in Part D- 2. Annex 11. Enhanced Ground Proximity Warning Systems (EGPWS) that the training has been implemented for operational crews of aircraft equipped with EGPWS. Of the 20 pilot training records audited no evidence was found of this training being conducted since 2001.

Criteria:

Civil Aviation Order 82.0 Appendix 1 ss 2.2 states in part that the "responsibilities of the chief pilot must unless CASA otherwise specified in writing include: (f) monitoring operational standards, maintaining training records and supervising the training and checking of flight crew of the operator"

Civil Aviation Regulation 217 (1) states that " An operator of a regular public transport service, an operator of any aircraft the maximum take-off weight of which exceeds 5700kilograms and any other operator that CASA specifies shall provide a training and checking organisation so as to ensure that members of the operator's operating crews maintain their competency"

CAR 217(3) states that "The training and checking organisation and its tests and checks provided for therein shall be subject to approval of CASA".

Civil Aviation Regulation CAR 215 (9) states that each member of the operations personnel of an operator shall comply with all instructions contained in the operations manual in so far as they relate to his or her duties or activities.

Date Issued: 9 / 5 / 08

Response Due: 6 / 6 / 08

CASA Office Address:

Is this RCA linked to a Safety Alert? ☐ Yes ☒ No

Components as causal factors: (Select only one)

☐ 1 – Management Commitment	☐ 7 – Personnel
☐ 2 – Planning	☒ 8 – Process in Practice
☐ 3 – Management Review	☐ 9 – Internal Audit
☐ 4 – Facility	☐ 10 – Internal Reporting
☐ 5 – Tools, Equipment and Materials	☐ 11 – Investigation
☐ 6 – Data, Information & Records	☐ 12 – Remedial, Corrective and Preventive Action

[signature] Mike Nolan Date: 9 / 5 / 08

CASA Office Use Only
File:______ Folio:______ Data Entry:______ Area office:______
Printed Name:______ Date Entered: __/__/__
Signature:______

Australian Government
Civil Aviation Safety Authority

AVIATION SAFETY AUDIT REPORT
Organisation Name: Pel-Air Aviation P/L
Audit Reference: Pel-Air March 2008

Request for Corrective Action

Name: Pel-Air Aviation Pty Ltd
ARN: 227573 **RCA:** 317101
Contact Address: PO Box 807 Mascot 1460

Corrective Action: *This section to be completed by the recipient or by his/her representative and forwarded to the above office by the response due date shown on Page 1 of this request.*

Remedial Action: ***(Action taken to fix the immediate effects of the identified deficiency):***

____

Root Cause(s) Identified: ***(what was the root cause of the identified deficiency)***

____

Corrective Action: ***(Action taken to address the root cause of the deficiency to ensure the deficiency does not recur):***

____

.... Date: __/___/_
Recipient's or Representative's Signature **Printed Name**

CASA Office Address: PO Box CP Condell Park 2200

CASA Office Use Only
Verification of Action:______________________________

CASA Representative Acceptance:
Signed: ______________ Name: ______________ Date: __/______/______
RCA/s on File: ______________ Folio: ______________ Associated Papers: ______________

ASSP data ENTERED
Sign: Date: 22.5.08
Name: Office: SYD

Australian Government
Civil Aviation Safety Authority

AVIATION SAFETY AUDIT REPORT
Organisation Name: Pel-Air Aviation P/L
Audit Reference: Pel-Air March 2008

Request for Corrective Action

317534

Organisation Name:	Pel-Air Aviation Pty Ltd		
ARN:	227573	**RCA:**	~~317102~~
Contact Address:	PO Box 807, Mascot, NSW	**Postcode:**	1460.
Regulatory Reference:	Civil Aviation Regulation 217, CAR 215, CAO 20.11.		
Audit Element:	Operational Standards – CAR 217 Training & Checking Organisation		

Note: *Issue of a Request for Corrective Action (RCA) does not in any way prejudice CASA's prerogative to take at any time such regulatory or other legal action as may be appropriate in the circumstances.*

Details of Deficiency:

The OPSM Part D-2 2.2.1 Emergency Procedures Training - Life Jackets and Life Rafts states that for initial qualification with the company each pilot shall demonstrate his/her competency in the use of the lifejacket in the water, and for initial qualification with the company, each pilot shall demonstrate in the water his/her competency in the deployment, inflation, boarding and passenger control procedures for the typical life raft carried on board. There is also a requirement for re-current training. Of the 20 flight crew training records audited the results provided evidence that neither the initial or re-current training had been conducted for most pilots.

Criteria:

Civil Aviation Regulation 217 (1) states that " An operator of a regular public transport service, an operator of any aircraft the maximum take-off weight of which exceeds 5700kilograms and any other operator that CASA specifies shall provide a training and checking organisation so as to ensure that members of the operator's operating crews maintain their competency"

CAR 217(3) states that "The training and checking organisation and its tests and checks provided for therein shall be subject to approval of CASA".

Civil Aviation Regulation CAR 215 (9) states that each member of the operations personnel of an operator shall comply with all instructions contained in the operations manual in so far as they relate to his or her duties or activities.

Date Issued: 9/5/08

Response Due: 6/6/08

CASA Office Address:

Is this RCA linked to a Safety Alert?

☐ Yes ☒ No

Components as causal factors: (Select only one)

☐ 1 – Management Commitment	☐ 7 – Personnel
☐ 2 – Planning	☒ 8 – Process in Practice
☐ 3 – Management Review	☐ 9 – Internal Audit
☐ 4 – Facility	☐ 10 – Internal Reporting
☐ 5 – Tools, Equipment and Materials	☐ 11 – Investigation
☐ 6 – Data, Information & Records	☐ 12 – Remedial, Corrective and Preventive Action

Mike Nolan Date: 9/5/08

CASA Office Use Only
File: Folio: Data Entry: Area office:
Printed Name: Date Entered: / /
Signature:

Australian Government
Civil Aviation Safety Authority

AVIATION SAFETY AUDIT REPORT
Organisation Name: Pel-Air Aviation P/L
Audit Reference: Pel-Air March 2008

Request for Corrective Action

Name: Pel-Air Aviation Pty Ltd
ARN: 227573
Contact Address: PO Box 807, Mascot, NSW

RCA Number: 317102

Corrective Action: *This section to be completed by the recipient or by his/her representative and forwarded to the above office by the response due date shown on Page 1 of this request.*

Remedial Action: ***(Action taken to fix the immediate effects of the identified deficiency):***

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Root Cause(s) Identified: ***(what was the root cause of the identified deficiency)***

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Corrective Action: ***(Action taken to address the root cause of the deficiency to ensure the deficiency does not recur):***

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.... Date: __/___/_

Recipient's or Representative's Signature **Printed Name**

CASA Office Address: PO Box CP 57 Condell Park 2200

CASA Office Use Only
Verification of Action:______________________________
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____

CASA Representative Acceptance:
Signed: ____________ Name: ____________ Date: __/____/____
RCA/s on File: ____________ Folio: ____________ Associated Papers: ____________

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AVIATION SAFETY AUDIT REPORT

Organisation Name: Pel-Air Aviation P/L

Audit Reference: Pel-Air March 2008

Australian Government
Civil Aviation Safety Authority

ASSP data ENTERED
Sign: Date: 22 5 08
Name: Office: PK

Audit Observation

Tuesday, 6 May 2008

Organisation Name:	Pelair Aviation Pty Ltd		
ARN:	227573	**Observation No:**	1/2008
Address:	PO Box 208 mascot NSW	**Postcode:**	1460

D13269

Audit Element:	AOC Operations

Observation Details:

On the 26 and 27 February a ramp check of VH-EET and observation of a CAR 217 training function was conducted and the following was noted;

Discussion was held with s 47F [redacted] and there appeared to be confusion over the requirement to renew the NDB component of an instrument rating. There is a possibility that IFR Renewals may have been conducted by Pelair Aviation with the NDB renewed by conducting a VOR approach.
It is suggested that the company review all pilot's files to ensure that when the last IFR renewal was conducted and the NDB component renewed, the NDB was actually tested.

During the approval process for s 47F [redacted] to conduct Emergency Procedures Training under CAO 20.11 discussion was held re 'wet drills'. It appears that the pilots are not being required to demonstrate competency for the use of life jackets in the water (initial qualification) as required in CAO 20.11 Appendix IV 1.4 (a). This would be required for a pilot who is operating an aircraft more than 50 miles from the shore on any charter flight or for passenger carrying charter if the flight path on departure or approach is over water.
The company should review pilot records to ensure that any crew member operating a company aircraft that requires the carrying of life jackets, has completed the initial qualification of 'wet drills' with the Pelair Aviation P/L.

During the 'Hand over – Take over' procedure the pilots are not completing the confirmations as listed in the Operations Manual. The final statement "I have control" is not being said.
It is suggested that the company either ensures pilots comply with the OM or the OM is amended to reflect the current practice.

During the flights observed there did not appear to be any fuel drains carried out as required by CAO 20.2 para 5. The weather conditions included frequent rain showers and over wing refuelling was carried out. Under these conditions there is the potential for water to accumulate in the fuel tanks to the point of becoming a significant safety issue.
It is suggested that the company conduct its own surveillance of this to see if this is a systemic problem and the company reminds the pilots of their obligations to comply with CAO 20.11.

Auditor: Malcolm Campbell	**Signature:**

CASA Office Use Only
File:__________Folio:__________Data Entry:__________Area office:__________

Printed Name:________________ Date Entered: ___/___/___

Signature: ________________

Australian Government
Civil Aviation Safety Authority

AVIATION SAFETY AUDIT REPORT
Organisation Name: Pel-Air Aviation P/L
Audit Reference: Pel-Air March 2008

Request for Corrective Action

Name: Pel-Air Aviation Pty Ltd
ARN: 227573
Contact Address: PO Box 807, Mascot, NSW

RCA Number: 317102

Corrective Action: *This section to be completed by the recipient or by his/her representative and forwarded to the above office by the response due date shown on Page 1 of this request.*

Remedial Action: ***(Action taken to fix the immediate effects of the identified deficiency):***

Root Cause(s) Identified: ***(what was the root cause of the identified deficiency)***

Corrective Action: ***(Action taken to address the root cause of the deficiency to ensure the deficiency does not recur):***

.... Date: __/___/_

Recipient's or Representative's Signature **Printed Name**

CASA Office Address: PO Box CP 57 Condell Park 2200

CASA Office Use Only

Verification of Action: ______________________________

CASA Representative Acceptance:

Signed: ____________ Name: ____________ Date: __/____/____

RCA/s on File: ____________ Folio: ____________ Associated Papers: ____________

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Australian Government
Civil Aviation Safety Authority

ASSP data ENTERED
Signed: Date: 22 5 08
Name: Office: BK

AVIATION SAFETY AUDIT REPORT
Organisation Name: Pel-Air Aviation P/L
Audit Reference: Pel-Air March 2008

Audit Observation

Tuesday, 6 May 2008

Organisation Name: Pelair Aviation Pty Ltd
ARN: 227573 **Observation No:** 1/2008
Address: PO Box 208 mascot NSW **Postcode:** 1460

D13269

Audit Element:	AOC Operations

Observation Details:

On the 26 and 27 February a ramp check of VH-EET and observation of a CAR 217 training function was conducted and the following was noted;

Discussion was held with [redacted] and there appeared to be confusion over the requirement to renew the NDB component of an instrument rating. There is a possibility that IFR Renewals may have been conducted by Pelair Aviation with the NDB renewed by conducting a VOR approach.
It is suggested that the company review all pilot's files to ensure that when the last IFR renewal was conducted and the NDB component renewed, the NDB was actually tested.

During the approval process for [redacted] to conduct Emergency Procedures Training under CAO 20.11 discussion was held re 'wet drills'. It appears that the pilots are not being required to demonstrate competency for the use of life jackets in the water (initial qualification) as required in CAO 20.11 Appendix IV 1.4 (a). This would be required for a pilot who is operating an aircraft more than 50 miles from the shore on any charter flight or for passenger carrying charter if the flight path on departure or approach is over water.
The company should review pilot records to ensure that any crew member operating a company aircraft that requires the carrying of life jackets, has completed the initial qualification of 'wet drills' with the Pelair Aviation P/L.

During the 'Hand over – Take over' procedure the pilots are not completing the confirmations as listed in the Operations Manual. The final statement "I have control" is not being said.
It is suggested that the company either ensures pilots comply with the OM or the OM is amended to reflect the current practice.

During the flights observed there did not appear to be any fuel drains carried out as required by CAO 20.2 para 5. The weather conditions included frequent rain showers and over wing refuelling was carried out. Under these conditions there is the potential for water to accumulate in the fuel tanks to the point of becoming a significant safety issue.
It is suggested that the company conduct its own surveillance of this to see if this is a systemic problem and the company reminds the pilots of their obligations to comply with CAO 20.11.

Auditor: Malcolm Campbell	**Signature:**

CASA Office Use Only
File:__________ Folio:__________ Data Entry:__________ Area office:__________

Printed Name:____________________ Date Entered: ___/___/___

Signature: ____________________

Audit Observation

Organisation Name: Pel-Air Aviation Pty Ltd

ARN: 227573 **Observation Number:** 712599

Address: PO Box 208 Mascot NSW **Postcode:** 1460.

Audit Element: Operational Standards - Document Control & Internal Audit

Observation Details:

The audit reviewed the documentation and functioning of the SMS, FRMS, internal Audit and some aspects of quality systems operating within Pel-Air Aviation. It was noted that the systems duplicated and/or conflicted with each other in their processes. It was further evident that the Business Risk Profile (BRP) spreadsheet used for tracking system outputs (Corrective Actions (CA), Accident and Incident Reporting, Fatigue Occurrences etc), whilst having the capacity to adequately track actions, was not being utilised and could not provide up-to-date data on status. This situation was mostly brought about by a lack of resources in the Compliance section and was discussed in detail with the Compliance Manager during the audit.

The company has made provision for additional staff in this section. The company, through the Compliance Manager, should put in place an action plan to remedy the backlog of report processing, close out open items, update the registers in the BRP and establish an interim procedure (until the manuals/documentation is reviewed) to ensure that the outputs of internal systems are processed and followed up in a timely manner.

The management of company documents, particularly the company operations manual and its distribution and amendment requires review. It was not easily identifiable when and who had reviewed the company operations manual following revision as the system for acknowledgement had broken down. Additionally there was no means for personnel to identify changes to the operations manual as the LEP was out of date (this was rectified during the audit). It was noted that this issue was identified in an internal non-compliance report (006/2007) issued in May 2007. Action and close-out on this report was outstanding.

It was further observed that the company extranet site, in the library section, did not provide access to the most current versions of manuals (FRMS) and included reference to documents and forms that were no longer applicable (SMS reporting manual).

The relationship between various company manuals should be reviewed as soon as practicable with the aim of providing a consistent suite of related manuals as per the diagram provided on page 3 of the Fatigue Risk Management System (FRMS) manual.

Auditor: Kerry Nolan **Date:** October 2007	**Signature:**

CASA Office Use Only
File:________________Folio:______________Data Entry:____________Area office:________________
Printed Name:________________________________Date Entered: ___/___/___
Signature: ____________________

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Australian Government Civil Aviation Safety Authority	***AVIATION SAFETY AUDIT REPORT*** *Organisation Name: Pel-Air Aviation P/L* *Audit Reference: Pel-Air March 2008*

CASA Ref: RCA 317098

Pelair Aviation Pty Ltd A.R.N. 227573
PO Box 208 Mascot 1460

Dear Sir/Madam,

Safety Alert - Immediate Action Required

CASA Issues Safety Alerts when a breach of the legislation raises serious safety concerns that require immediate action by the recipient.

There are a number of options available to CASA to respond to such breaches of legislation. In this case, CASA considers that the interests of safety will best be served as a first option, by giving you the opportunity to address the breach and initiate action to ensure there are no similar occurrences.

As the holder of the exemption, it is expected that you will take immediate action to ensure that the breach or breaches are rectified:

- Before continuing any activity carried out under the exemption authority held by you that is the subject of the deficiency.

The attached Request for Corrective Action - Audit Ref: 317098 outlines the serious legislative breach.

It is expected that you will give this matter your urgent attention. When you have rectified the deficiency, advise us of the Remedial and Corrective Action you have taken by forwarding to us the completed response to the Request for Corrective Action.

Yours faithfully,

Malcolm Campbell
Acting Team Leader Flying Operations
Sydney Region office

12 March 2008

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ASSP date ENTERED
Signed 22/5/08
Name Office

Australian Government
Civil Aviation Safety Authority

AVIATION SAFETY AUDIT REPORT

Organisation Name: Pel-Air Aviation P/L

Audit Reference: Pel-Air March 2008

Organisation Name:	Pelair Aviation Pty Ltd		
ARN:	227573	**RCA/Audit Ref #:**	317098
Contact Address:	PO Box 208 Mascot	**Postcode:**	1460
Regulatory Reference:	Act 28BE, CAR 215, CAO 48.0		
Audit Element:	Crew Scheduling		

Note: *Issue of a Request for Corrective Action (RCA) does not in any way prejudice CASA's prerogative to take at any time such regulatory or other legal action as may be appropriate in the circumstances.*

Details of Deficiency:

Pelair Aviation was granted exemption against the requirements of CAO 48.0 to operate under a Fatigue Risk Management System (FRMS) in April 2007. The FRMS and the company's operations manual requires that prior to a pilot being rostered for duty he/she will have undergone training in the use of the FRMS. During the scheduled audit conducted on 12 March 2008, the company admitted that none of its pilots have undergone the required training.

All pilots must revert to compliance with CAO 48.0 until CASA is satisfied that full compliance with the training requirements of the FRMS and the operations manual has been met.

Criteria:

Act 28BE Duty to exercise care and diligence

(1) The holder of an AOC must at all times take all reasonable steps to ensure that every activity covered by the AOC, and everything done in connection with such an activity, is done with a reasonable degree of care and diligence.

(2) If the holder is a body having legal personality, each of its directors must also take the steps specified in subsection (1).

(3) It is evidence of a failure by a body and its directors to comply with this section if an act covered by this section is done without a reasonable degree of care and diligence mainly because of:

(a) inadequate corporate management, control or supervision of the conduct of any of the body's directors, servants or agents; or

(b) failure to provide adequate systems for communicating relevant information to relevant people in the body.

CAR 215 Operations manual

(9) Each member of the operations personnel of an operator shall comply with all instructions contained in the operations manual in so far as they relate to his or her duties or activities.

CAO 48.0 Flight Time Limitations — General 4 Exemptions

4.1 CASA may, by instrument in writing, exempt a person from any of the requirements set out in Part 48.

4.2 An exemption under paragraph 4.1 may be granted subject to such conditions as CASA considers necessary in the interests of the safety of air navigation.

Date Issued: 12/03/2008

Response Due: 19/03/2008

CASA Office Address: PO Box CP 57
Condell Park 2200

Is this RCA linked to a Safety Alert?

☒ Yes ☐ No

Components as causal factors: (Select only one)

☒ 1 – Management Commitment
☐ 2 – Planning
☐ 3 – Management Review
☐ 4 – Facility
☐ 5 – Tools, Equipment and Materials
☐ 6 – Data, Information & Records
☐ 7 – Personnel
☐ 8 – Process in Practice
☐ 9 – Internal Audit
☐ 10 – Internal Reporting
☐ 11 – Investigation
☐ 12 – Remedial, Corrective and Preventive Action

352

Signature:

Printed Name:

Date: 12/03/2008

Malcolm Campbell

CASA Office Use Only

File:__________ Folio:__________ Data Entry:__________ Area office:__________

Printed Name:__________ Date Entered: __/__/__

Signature: __________

Australian Government
Civil Aviation Safety Authority

AVIATION SAFETY AUDIT REPORT
Organisation Name: Pel-Air Aviation P/L
Audit Reference: Pel-Air March 2008

Name: Pelair Aviation Pty Ltd
ARN: 227573 **RCA Number:** 317098
Contact Address: PO Box 208 Mascot 1460

Corrective Action: This section to be completed by the recipient or by his/her representative and forwarded to the above office by the response due date shown on Page 1 of this request.

Remedial Action: ***(Action taken to fix the immediate effects of the identified deficiency):***

Root Cause(s) Identified: ***(what was the root cause of the identified deficiency)***

Corrective Action: ***(Action taken to address the root cause of the deficiency to ensure the deficiency does not recur):***

.... Date: __/__/__
Recipient's or Representative's Signature **Printed Name**

CASA Office Address: PO Box CP 57, Condell Park 2200

CASA Office Use Only
Verification of Action: ALL ACTIVE PILOTS TRAINED IN FRMS

CASA Representative Acceptance:
Signed: [signature] Name: Malcolm Campbell Date: 1 / 10 / 08
RCA/s on File: THIS FILE Folio: Associated Papers:

ASSP data ENTERED
Signed: [signature] Date: 3/10/08
Name: 6 CASA Office: BK