TECHNICAL STANDARDS – Issue version (2024)

NAMCATS : Part 135 – AIR TRANSPORT OPERATIONS: CARRIAGE ON AEROPLANES OF LESS THAN 20 PASSENGERS OR CARGO

Document: NAMCATS-OPS-135/2024

Issue Date: (01 October 2024)

1. General

1.2 Section 227 of the Civil Aviation Act, 2016 (Act no. 6 of 2016 – hereinafter "the Act") empowers the Executive Director of Civil Aviation to issue technical standards for civil aviation "on such matters as may be prescribed". Section 227(3) of the Act further empowers the Executive Director of Civil Aviation to incorporate into a technical standard any international aviation standard or any amendment without publishing the text of such standard or any amendment "by mere reference" to the title, number and year of issue of such standard or amendment or to any other particulars by which such standard or amendment is sufficiently identified.

1.3 By way of Government Notice 11/2024 published in Government Gazette 8299 dated 1st February 2024, NAMCARS (amendment 2024) provides for Part 135 – "Air Transport Operations: Carriage on Aeroplanes of less than 20 Passengers or Cargo" (OPS-135). This Part 135 provides for the issue of technical standards as NAM-CATS-OPS-135.

1.4 The Executive Director of Civil Aviation has, pursuant to the empowerment mentioned above, issued technical standards relating to NAMCAR Part 135 to be known as NAM-CATS-OPS-135 as further set out in the SCHEDULE herein.

1.5 To the extent possible, each reference to a technical standard in this document, is a reference to the corresponding regulation in the Namibian Civil Aviation Regulations.

Example: *(1) Technical standard 135.02.2 refers to Part 135, Subpart 02, Regulation 2, Technical standard 135.02.2(1) refers to sub-regulation (1) of Regulation 2.*

1.6 Where there is any perceived disparity of meaning or inconsistency between these technical standards and the regulations, the provisions of the regulations will take precedence.

1.7 Where there is a difference between a standard and procedure prescribed in an ICAO document and the Civil Aviation Technical Standards (CATS), the CATS standard will prevail.

2. GUIDANCE MATERIAL

2.1 Guidelines and recommendations in support of any Technical Standard are contained in schedules or appendices to, and/ or compliance notes inserted throughout, technical standards. These guidelines, upon release, are intended to provide recommendations and guidance to illustrate a means, but not necessarily the only means of complying with the regulations and technical standards. They may explain certain regulatory requirements by providing interpretive and explanatory materials. It is expected that service providers will document internal actions in their own operational manuals, to put into effect those, or similarly adequate, practices.

3. AMENDMENTS TO THE TECHNICAL STANDARDS

3.1 The NCAA Safety Division, Safety Promotion and Quality (SPQ) Department has responsibility for the technical content of this technical standard.

3.2 This Technical Standard is issued, and may only be amended, under the authority of the Executive Director of Civil Aviation.

3.3 Requests for changes to the content of this Technical Standard must be dealt with in accordance with the relevant Sub-Part of Part 3 of the NAMCARS. Requests shall be forwarded to the Executive Director and may come from:

(a) technical areas within NCAA; or
(b) aviation industry service providers or operators; or
(c) pilots and ATC staff,

3.4 The need to change the content of this technical standard may arise for any of the following reasons:

(a) to ensure safety;
(b) to ensure standardisation;
(c) to respond to changed NCAA regulations or standards;
(d) to respond to changes initiated by ICAO; or
(e) to accommodate proposed initiatives or new technologies, and for it to meet the validity and other requirements set out accordance with the relevant Sub-Part of Part 3 of the NAMCARS.

3.5 NCAA may approve trials of new procedures or technologies to develop appropriate standards.

4. INTERNATIONAL STANDARDS

4.1 Based on the empowering provisions to the Executive Director in section 227 to incorporate into a technical standard any international aviation standard or any amendment without stating the text of such standard or amendment, by mere reference to the title, number and year of issue of such standard or amendment, or to any other particulars by which such standard or amendment is sufficiently identified the Technical Standards herein provide for the following international standards, recommended practices and procedures, as amended from time to time, are incorporated into the technical standards contained in this document:

(a) ICAO Annex 6 – Operation of Aircraft;

4.2 Differences from ICAO Standards, Recommended Practices and Procedures are published in the AIP.

These Technical Standards are effective from 01 October 2024.
Further access is available on NCAA website: https://www.ncaa.com.na
Enquiries: ops@ncaa.na

TOSKA SEM
EXECUTIVE DIRECTOR

NAM-CATS 135

Air Transport Operations: Carriage of less than 20 Passengers or Cargo

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135.02.2 MINIMUM REQUIREMENTS FOR ASSIGNMENT AS PILOT-IN-COMMAND

1. Flight time experience

(1) No person shall act as the pilot-in-command (PIC) of a passenger-carrying aeroplane with a maximum certificated seating configuration of 10 or more passengers unless -

(a) in the case of an IFR flight, the person has acquired at least 500 hours of flight time; and

(b) in the case of a VFR flight at night, the person has acquired not less than 350 hours of flight time.

2. Operating experience

(1) An operator of an aeroplane shall establish procedures to ensure a pilot is not assigned as the PIC following conversion to a new type of aeroplane or upgrading to the PIC position on the same or a different aeroplane unless adequate in-flight orientation and familiarisation has taken place.

(2) The procedures specified in paragraph (1) shall include a line induction programme during which a PIC on a new type of aeroplane or recently upgraded PIC shall, under the supervision of a PIC qualified to conduct line induction training and designated by the operator, acquire operational flight time comprised of a minimum number of sectors and/or hours of flight time. The minimum number of sector/flight hours shall be published in the operations manual.

Note - *Operational flight time means flight time acquired in addition to any training time*.

(3) A pilot shall not be authorised to operate as an unrestricted PIC until the operator is satisfied that such pilot is capable of operating safely without supervision and the pilot's training records have been annotated accordingly.

(4) Following the line induction programme, the operator shall consider mitigating the risks associated with low experience levels through the implementation of some or all of the following -

(a) limiting the authorised radius of action of the aeroplane;

(b) imposing higher route and aerodrome operating minima;

(c) increased operational oversight;

(d) ensure the ability to communicate with the operator as required;

(e) crewing with an experienced second-in-command (for two crew operations); or

(f) additional line training.

135.02.10 FLIGHT TIME AND DUTY PERIOD SCHEME

Note - *CAR 135.02.10 requires each operator to establish a scheme for the administration of flight time and duty periods. Operators are reminded that they bear sole responsibility for such schemes being in full compliance with any Acts, Laws and Regulations that are external to the Namibia Civil Aviation Regulations, notwithstanding any approvals given by the NCAA.*

1. General

Time spent on flight watch or home reserve may also be deemed to be part of a rest period as provided in section 8(2)(e) of this technical standard.

2. Maximum flight time

(1) An operator may not allow nor may a flight crew member exceed the following maximum flight times -

(a) 10 hours during any duty period of which a maximum of eight hours may be consecutive, except that single-pilot night VFR or IFR operations in an aeroplane without a serviceable autopilot are restricted to 8 hours in a duty period;

(b) during the preceding seven days -

(i) for a single-pilot operation, 35 hours;

(ii) for a multi-pilot operation, 40 hours; and

(iii) for mixed single- and multi-pilot operations, 37.5 hours;

(c) during the preceding thirty days -

(i) for a single-pilot operation, 100 hours;

(ii) for a multi-pilot operation, 120 hours; and

(iii) for mixed single- and multi-pilot operations, 110 hours;

(d) 300 during the preceding 90 days; or

(e) 1000 hours during the preceding 365 days.

(2) If a flight crew member expects his or her projected cumulative flight hours for a particular operation to exceed the appropriate limit, the flight crew member shall inform the operator accordingly.

3. Operators' schemes and their approval

(1) An operator shall submit a proposed scheme for the regulation of flight time and duty periods and minimum rest periods to the Executive Director for approval.

(2) Any deviation from the approved scheme shall be submitted to the Executive Director for consideration.

4. General principles of control of flight, duty and rest time

(1) The prime objective of any scheme of flight time and duty limitations is to ensure that flight crew members are adequately rested at the beginning of each flight duty period (FDP). Aeroplane operators will therefore need to take account of inter-related planning constraints on -

(a) individual duty and rest periods;

(b) the length of cycles of duty and the associated periods of rest; and

(c) cumulative duty hours within specific periods.

(2) Duties shall be scheduled within the limits of the operator's scheme. To allow for unforeseeable delays the pilot-in-command (PIC) may, within prescribed conditions, use his or her discretion to exceed the limits on the day. Nevertheless, flight schedules shall be realistic and the planning of duties shall be designed to avoid as far as possible exceeding the flight time and duty limits.

(3) Other general considerations in the sensible planning of duties are -

(a) the need to construct consecutive work patterns which will avoid as far as possible such undesirable rostering practices as alternating day/night duties and the positioning of flight crews in a manner likely to result in a serious disruption of established sleep/work patterns;

(b) the need, particularly where flights are carried out on a programmed basis, to allow a reasonable period for the pre-flight notification of duty to flight crews, other than those on standby duty; and

(c) the need to plan time off and also to ensure that flight crews are notified of their allocation well in advance.

5. Responsibilities of flight crew members

It is the responsibility of all flight crew members to make optimum use of the opportunities and facilities for rest provided by the operator and to plan and use their rest periods properly so as to minimise the risk of fatigue.

6. Standard provisions required for an operator's scheme

(1) The standard provisions which the Executive Director regards as the basis for an acceptable scheme of flight time and duty limitations and which, if included in an operator's scheme, will facilitate approval by the Executive Director are contained in sections 7 to 13 below.

(2) Although operators are expected to plan their schemes in accordance with the requirements, it is however, recognised that the standard provisions will not necessarily be completely adaptable to every kind of operation. In exceptional circumstances therefore, operators may apply to have variations from the standard provisions included in their schemes. However, such variations should be kept to a minimum and approval will only be granted where an operator can show that these proposed provisions will ensure an equivalent level of protection against fatigue.

7. Limitations of single flight duty periods - flight deck crew

Note - *The tables referred to in this section may be found in section 12 of this technical standard*.

7.1. Maximum rostered flight duty periods

The maximum rostered FDP (in hours) shall be in accordance with Table 1, or Table 2 or 3, or Table 4 or 5. Rostering limits in the tables may be extended by in-flight relief or split duty under the terms of sections 7.2 and 7.3. On the day, the PIC may at his or her discretion further extend the FDP actually worked in accordance with section 7.6.

(1) Maximum FDP - Two pilot crews

Table 2 applies when the FDP starts at a place where the flight crew member is acclimatised to local time and Table 3 applies to other times. To be considered acclimatised for the purpose of this technical standard, a flight crew member shall be allowed three consecutive local nights free of duty within a local time zone band which is two hours wide. Pilotwill thereafter be considered to remain acclimatised

to that same time zone band until the pilot ends a duty period at a place where local time falls outside this time zone band.

(2) Maximum FDP - Two pilots plus additional flight crew member

Table 4 applies when the FDP starts at a place where the flight crew member is acclimatised to local time, and Table 5 applies at other times. To be considered acclimatised for the purposes of this technical standard, a flight crew member shall be allowed three consecutive local nights free of duty within a local time zone band which is two hours wide. The pilot will thereafter be considered to remain acclimatised to that same time zone band until the pilot ends a duty period at a place where local time falls outside this time zone band.

(3) Limits on two flight crew long range operations

(a) When an aeroplane flight deck crew comprises only two pilots, the allowable FDP is calculated as follows. A sector scheduled for more than 7 hours is considered as a multi-sector flight, as below -

Scheduled sector times	Sectors	
	Acclimatised to local time	Not acclimatised to local time
Sector length over 7 hrs but not more than 9 hrs	2	4
Sector length over 9 hrs but not more than 11 hrs	3	4
Sector length over 11 hrs	4	Not applicable

(b) Table 2 is then entered with the start time of the flight duty period and the "modified" number of sectors, to determine the allowable FDP.

(c) When an additional, current, type rated pilot is a flight crew member, then these limits do not apply and the permissible FDP is determined by entering Table 2 or 3 with time of start and the actual sectors planned.

7.2. Extension of flight duty period by in-flight relief

(1) When any additional flight crew member is carried to provide in-flight relief for the purpose of extending a FDP, pilot shall hold qualifications which will meet the requirements of the operational duty for which pilot is required as a relief.

(2) When in-flight relief is provided, there shall be available, for the flight crew member who is resting, a comfortable reclining seat or bunk separated and screened from the flight deck and passengers.

(3) A total of in-flight rest of less than three hours will not count towards extension of an FDP, but where the total of in-flight rest (which need not be consecutive) is three hours or more, the rostered FDP may be extended beyond that permitted in Tables 2 and 3 or 4 and 5 by -

(a) if rest is taken in a bunk, a period equal to one half of the total of rest taken, provided that the maximum FDP permissible is 18 hours; and

(b) if rest is taken in a seat, a period equal to one third of the total of rest taken, provided that the maximum FDP permissible is 15 hours.

(4) The maximum extension allowable is equivalent to that applying to the basic flight crew member with the least rest.

(5) Where a flight crew member undertakes a period of in-flight relief and after its completion is wholly free of duty for the remainder of the flight, that part of the flight following completion of duty may be classed as positioning and be subject to the controls on positioning detailed in section 7.4.

7.3. Extension of flight duty period by split duty

When a FDP consists of two or more flight duties separated by less than a minimum rest period, then the FDP may be extended beyond that permitted in the tables by the amounts indicated below -

Consecutive hours rest	Maximum extension of the FDP
Less than 3	Nil
3 - 10	Period equal to half of the consecutive hours rest taken

The rest period shall not include the time required for immediate post-flight and pre-flight duties. When the rest period is not more than six hours it will be sufficient if a quiet and comfortable place is available, not open to the public, but if the rest period is more than six consecutive hours, then a bed shall be provided.

7.4. Positioning

All time spent on positioning as required by the operator is classed as duty, but positioning as a passenger does not count as a sector when assessing the maximum permissible FDP. Positioning, as required by the operator, which immediately precedes a FDP, is included as part of the FDP for the purpose of section 7.1.

7.5. Travelling time

(1) Travelling time other than that time spent on positioning may not be classed as duty time and may not be included in cumulative totals of duty hours.

Note - *Travelling time from home to departure aerodrome can become an important factor if long distances are involved. If the journey time from home to the normal departure aerodrome is lengthy, flight crew members should make arrangements for accommodation nearer to their bases to ensure adequate pre-flight rest.*

(2) Where travelling time between the aerodrome and sleeping accommodation provided by the operator exceeds thirty minutes each way, the rest period shall be increased by the amount of the excess, or such lesser time as is consistent with a minimum of ten hours at the sleeping accommodation.

(3) When flight crew members are required to travel from their home to an aerodrome other than the one from which they normally operate, the assumed travelling time from the normal aerodrome to the other aerodrome is classed as positioning and is subject to the controls of positioning detailed in section 7.4.

7.6. Pilot-in-command's discretion to extend a flight duty period

Note - *It is important to note that the PIC discretion shall take into consideration whether or not a flight crew member is suffering from or, having regard to the circumstances of the flight to be undertaken, is likely to suffer from fatigue which may endanger the safety of the aeroplane or its flight crew members and passengers . . ." as specified in CAR 135.02.9(2)(b).*

(1) A PIC may, at his or her discretion, extend a FDP beyond the maximum normally permitted, provided the pilot is satisfied that the flight can safely be made. In these circumstances the maximum normally permitted is calculated according to what actually happens, not on what was planned to happen. The operator's scheme shall include guidance to PICs on the limits within which discretion to extend a FDP may be exercised. An extension of three hours beyond the maximum normally permitted should be regarded as the maximum, except in cases of emergency.

(2) Whenever a PIC so exercises his or her discretion,the pilot shall report it to the operator and, should the maximum normally permitted be exceeded by more than two hours, both the PIC and the operator shall submit a written PIC's discretion report - extension of flight duty period, to the Executive Director within thirty days.

Notes -

1. *Discretion reports either concerning extension of a FDP in excess of two hours or reduction of a rest period shall be submitted to the Executive Director. Those reports will be used by the Executive Director when assessing the realism of particular schedules. The information required to be submitted and an example of the form may be obtained from the NCAA.*

2. *An emergency in respect of an extension of an FDP is a situation which in the judgment of the PIC presents serious risk to health or safety.*

7.7. Delayed reporting time

When flight crew members are informed of a delay before leaving their place of rest the FDP starts at the new reporting time or four hours after the original reporting time, whichever is the earlier. The maximum FDP is based on the original reporting time. This subsection does not apply if flight crew members are given ten hours or more notice of a new reporting time.

8. Rest periods

(1) It is the responsibility of the operator to notify flight crew members of the applicable FDP and not to schedule them for duty other than flight watch or home reserve, so that adequate and, within reason, uninterrupted pre-flight rest can be obtained by the flight crew before

the commencement of the next flight duty period. Away from base the operator shall provide the opportunity and facilities for the flight crew to obtain adequate pre-flight rest. It is the operator's responsibility to ensure that rest accommodation is satisfactory. When operations are carried out at such short notice that it is impracticable for an operator to ensure that rest accommodation is satisfactory, it will be the PIC's responsibility to obtain satisfactory accommodation.

(2) The following rest period requirements shall be followed -

(a) each flight duty period, as well as flight watch and home reserve, shall be preceded by a rest period of at least -

(i) nine consecutive hours including a local night;

(ii) ten consecutive hours; or

(iii) if the preceding FDP, adjusted for split duty, exceeds eleven hours, an additional rest period shall be provided for in the operator's scheme to the satisfaction of the Executive Director;

(b) where a flight crew member has completed two consecutive flight duty periods, the aggregate of which exceeds eight hours flight time or eleven hours flight duty time (extensions by in-flight relief or split-duty disregarded), and the intervening rest period has been less than twelve consecutive hours embracing the hours between 22h00 and 06h00 local time, the pilot shall have a rest period of at least twelve consecutive hours embracing the hours between 22h00 and 06h00 local time or so much longer as to embrace these hours prior to commencing any further duties, but not necessarily longer than twenty-four consecutive hours; provided that this requirement does not apply in respect of consecutive flight watch and home reserve duties;

(c) following 50 hours of cumulative flight duty in any rolling seven-day period associated with his or her employment, except flight watch and home reserve duty, a flight crew member shall have a rest period of not less than 24 consecutive hours before commencing further duties;

(d) when a flight crew member has completed a FDP in excess of eighteen hours, the pilot shall receive a rest period of at least eighteen hours including a local night before the pilot commences any further duties; and

(e) time spent on flight watch and home reserve duty prior to a FDP shall not be counted when determining the limitations associated with the flight duty period.

(3) Pilot-in-command's discretion to reduce a rest period

A PIC may, at his or her discretion, reduce a rest period to below the minimum required by section 8(2). The exercise of such discretion shall be considered exceptional and should not be used to reduce successive rest periods. A rest period shall be long enough to allow flight crew members at least eight hours rest at the accommodation where the rest is taken. If a rest period is reduced, the PIC shall submit a report to his or her employer and if the

reduction exceeds two hours, a written report shall be submitted to the Executive Director within thirty days. (See note 1 to section 7.6(2)).

(4) For the purpose of calculating the minimum rest period before commencement of flight duty, the required post-flight duties on completion of the previous FDP is added to such FDP.

9. Duty periods

(1) The following limits apply -

Duty	Maximum duration
Flight watch	No limit*
Home reserve	No limit*
Positioning	No maximum**
Standby	Maximum 12 hours (not necessarily consecutive) in any 24 hour period
Standby + FDP	20 hours

* However, the provisions of paragraph (2) apply.

** However, the provisions of section 7.4 apply.

(2) For the purpose of calculating duty time, the following applies -

(a) for the calculation of accumulated duty time in terms of section 11, flight watch and home reserve is credited on the basis of eight hours for every period of twenty-four or fewer consecutive hours or on a one-for-one basis, whichever is the lesser;

(b) standby duty time shall count fully as duty time for the calculation of accumulated duty time in terms of sections 8(2)(c) and (d) and 11; and

(c) see section 7.4 in respect of positioning time.

10. Days off

Flight crew members shall -

(1) not work more than seven consecutive days between days off; and

(2) have two consecutive days off in any consecutive fourteen days; and

(3) have a minimum of six days off in any consecutive four weeks at the aerodrome from which they normally operate; and

(4) have an average of at least eight days off in each consecutive four week period, averaged over three such periods.

11. Cumulative duty hours

The average weekly total of duty hours may not exceed sixty hours over seven days or fifty hours averaged over any four consecutive weeks. All types of duty, flight duty, split duty, stand-by and positioning is counted in full for this purpose. Any period of seven or more consecutive days within which the flight crew member is employed on duty other than flight duty, flight watch or home reserve, standby or positioning is not included in calculating the above average weekly total of duty hours.

12. Tables

Table 1: Maximum flight duty period: Single-pilot crews - aeroplanes certified for single-pilot operations

Local time of start	Sectors				
	Up to 4	5	6	7	8 or more
0500 – 0659	10	9 ¼	8 ½	8	8
0700 – 1359	11	10 ¼	9 ½	8 ¾	8
1400 – 2059	10	9 ¼	8 ½	8	8
2100 – 0459	9	8 ¼	8	8	8

Note - *Pilots engaged in repetitive short flights, with an average eight or more take-offs and landings per hour, shall have a break of at least thirty minutes within any continuous period of three hours away from the aircraft; however, for the purpose of this technical standard each such series of repetitive flights shall be counted as a single sector.*

Table 2: Maximum flight duty period: Two pilot crews - aeroplanes: Acclimatised to local time

Local time of start	Sectors							
	1	2	3	4	5	6	7	8 or more
0500 – 0659	13	12 ¼	11 ½	10 ¾	10	9 ¼	9	9
0700 – 1359	14	13 ¼	12 ½	11 ¾	11	10 ¼	9 ½	9
1400 – 2059	13	12 ¼	11 ½	10 ¾	10	9 ¼	9	9
2100 – 0459	12	11 ¼	10 ½	9 ¾	9	9	9	9
2200 – 0459	11	10 ¼	9 ½	9	9	9	9	9

Table 3: Maximum flight duty period: Two pilot crews - aeroplanes: Not acclimatised to local time

Length of preceding rest (hours)	Sectors						
	1	2	3	4	5	6	7 or more
Up to 18 or over 30	13	12 ¼	11 ½	10 ¾	10	9 ¼	9
Between 18 and 30	12	11 ¼	10 ½	9 ¾	9	9	9

Note - *The reason that available duty times are less following rest periods inside 18-30 hours is the aeromedical advice that the quality of rest is less due to the disturbance of the body's natural rhythm.*

Table 4: Maximum flight duty period: Basic crew consisting of three flight crew members - aeroplanes certified for three crew members: Acclimatised to local time

Local time of start	Sectors							
	1	2	3	4	5	6	7	8 or more
0500 – 0659	13	12 ¼	11 ½	10 ¾	10	9 ¼	9	9
0700 – 1359	14	13 ¼	12 ½	11 ¾	11	10 ¼	9 ½	9
1400 – 2059	13	12 ¼	11 ½	10 ¾	10	9 ¼	9	9
2100 – 2159	12	11 ¼	10 ½	9 ¾	9	9	9	9
2200 – 0459	11	10 ¼	9 ½	9	9	9	9	9

Table 5: Maximum flight duty period: Basic crew consisting of three flight crew members aeroplanes certified for three flight crew members: Not acclimatised to local time

Length of preceding rest (hours)	Sectors						
	1	2	3	4	5	6	7 or more
Up to 18 or over 30	13	12 ¼	11 ½	10 ¾	10	9 ¼	9
Between 18 and 30	12	11 ¼	10 ½	9 ¾	9	9	9

Note - *The reason that available duty times are less following rest periods inside 18-30 hours is the aeromedical advice that the quality of rest is less due to the disturbance of the body's natural rhythm.*

13. Records to be maintained

(1) An operator shall retain flight crew member flight time and duty period records as provided in
CAR 135.04.6.

(2) An operator shall retain all PIC discretion reports of extended flight duty periods and reduced rest periods for a period of at least six months.

135.02.11 FATIGUE RISK MANAGEMENT SYSTEM

1. Fatigue risk management policy

(1) An air operator's FRMS policy shall -

(a) clearly identify all elements of the FRMS;

(b) define the scope of the operations in the operations manual;

(c) reflect the shared responsibility of management, flight, cabin crew and other involved personnel;

(d) require that clear lines of accountability for management, flight and cabin crew and other involved personnel are identified;

(e) clearly state the safety objectives of the FRMS;

(f) be signed by the accountable executive of the organisation;

(g) be communicated, with visible endorsement, to all the relevant areas and levels of the organisation;

(h) declare management commitment to effective safety reporting;

(i) declare management commitment to the provision of adequate resources for the FRMS;

(j) declare management commitment to continuous improvement of the FRMS; and

(k) document periodic reviews to ensure it remains relevant and appropriate.

(2) FRMS manual

(a) An air operator shall develop and keep a current FRMS manual that defines and records the following:

(i) FRMS policy and objectives;

(ii) FRMS processes and procedures;

(iii) accountabilities, responsibilities and authorities for these processes and procedures;

(iv) mechanisms for on-going involvement of management, flight and cabin crew members and all other involved personnel;

(v) FRMS training programmes, training requirements and attendance records;

(vi) scheduled and actual flight times, duty periods and rest periods with significant deviations and reasons for such deviations; and

(vii) FRMS outputs including findings from collected data, recommendations, and actions taken.

Note - *This manual may be incorporated into the SMS manual of the system of operations manuals*.

2. Fatigue risk management processes

2.1. Identification of hazards

(1) When identifying hazards, an air operator shall develop and maintain the following three fundamental and documented processes for fatigue hazard identification:

(a) The predictive process which shall identify fatigue hazards by examining crew scheduling and taking into account factors known to affect sleep and fatigue and their effects on performance. Methods of examination may include but are not limited to:

(i) Operator or industry operational experience and data collected on similar types of operations;

(ii) Evidence-based scheduling practices; and

(iii) Bio-mathematical models.

(b) The proactive process which shall identify fatigue hazards within current flight operations. Methods of examination may include but are not limited to:

(i) Self-reporting of fatigue risks;

(ii) crew fatigue surveys;

(iii) relevant flight and cabin crew performance data;

(iv) available safety databases and scientific studies; and

(v) analysis of planned versus actual time worked.

(c) The reactive process which shall identify the contribution of fatigue hazards to reports and events associated with potential negative safety consequences in order to determine how the impact of fatigue could have been minimised. At a minimum, the process may be triggered by any of the following -

(i) fatigue reports;

(ii) confidential reports;

(iii) audit reports;

(iv) incidents; and

(v) flight data analysis events.

(2) Risk assessment

(a) An air operator shall develop and implement risk assessment procedures that determine the probability and potential severity of fatigue-related events and identify when the associated risks require mitigation. The risk assessments procedures shall review identified hazards and link them to the following:

(i) operational processes;

(ii) their probability;

(iii) possible consequences; and

(iv) the effectiveness of existing safety barriers and controls.

(b) An air operator shall develop and implement risk mitigation procedures that -

(i) select the appropriate mitigation strategies;

(ii) implement the mitigation strategies; and

(iii) monitor the strategies implementation and effectiveness.

3. FRMS safety assurance processes

(1) An air operator shall develop and maintain FRMS safety assurance process to attain the following -

(a) Provide for continuous FRMS performance monitoring, analysis of trend, and measurement to validate the effectiveness of the fatigue safety risk controls. The sources of data may include, but are not limited to the following:

(i) hazard reporting and investigations;

(ii) audits and surveys; and

(iii) reviews and fatigue studies;

(b) Provide a formal process for the management of change which shall include but is not limited to the following:

(i) Identification of changes in the operational environment that may affect FRMS;

(ii) identification of changes within the organisation that may affect FRMS; and

(iii) consideration of available tools which could be used to maintain or improve FRMS performance prior to implementing changes; and

(iv) provide for the continuous improvement of the FRMS. This shall include but is not limited to the following -

(aa) the elimination and/or modification of risk controls have had unintended consequences or that are no longer needed due to changes in the operational or organisational environment;

(bb) routine evaluations of facilities, equipment, documentation and procedures; and

(cc) the determination of the need to introduce new processes and procedures to mitigate emerging fatigue-related risks.

4. FRMS promotion processes

(1) An air operator shall support the on-going development of the FRMS, the continuous improvement of its overall performance, and attainment of optimum safety levels. The following shall be established and implemented by the air operator as part of its FRMS -

(a) training programmes to ensure competency commensurate with the roles and responsibilities of management, flight and cabin crew, and all other relevant personnel under the planned FRMS; and

(b) an effective FRMS communications plan that ensures the following -

(i) FRMS policies, procedures and responsibilities are explained to all relevant stakeholders; and

(ii) communication channels used to gather and disseminate FRMS related information are described.

Note - *The FRMS shall reside within a SMS.*

135.03.1 OPERATOR APPROVED TRAINING PROGRAMME

1. Applicability of training

(1) For the purposes of this section -

(a) "the operator" means the operator employing a pilot whose training was conducted by another operator; and

(b) "the other operator" means the operator who conducted the training on the pilot.

(2) Except as provided in paragraphs (3) and (4), each person employed by an operator and required to receive the training specified in this Subpart shall take such training from that operator or a contracted organisation, as provided in section 2 of this technical standard.

(3) The initial and recurrent ground training requirements specified in Subpart 3 for a pilot on an aeroplane type certificated for a maximum mass of 5 700kg or less shall be deemed to be completed by the operator if completed as part of another Namibia operator's approved training programme: Provided that the other operator operates the same aeroplane type and, prior to conducting a commercial air transport operation -

(a) in the event the operator's aeroplanes are different models than those upon which the other operator's ground training was based, the operator ensures such pilot receives additional training covering any differences between the models, including, at least, systems differences, engine/airframe limitations, performance considerations and operating characteristics;

(b) in the event the operator's aeroplanes are equipped with different ancillary equipment than those upon which the other operator's ground training was based or not given, such as navigational aids, auto flight system, flight director/flight management system (FMS), airborne collision avoidance system (ACAS), terrain awareness and warning system (TAWS), weather radar, etc., the operator shall provide training on such equipment; and

(c) the operator establishes, through the administration of a technical ground examination, that the pilot has adequate knowledge of the different models of aeroplanes and equipment noted in sub-paragraphs (a) and (b) above.

(4) The initial and recurrent flight training requirements specified in Subpart 3 for a pilot on an aeroplane type certificated for a maximum mass of 5 700 kg or less shall be deemed to be completed by the operator if completed as part of another Namibia operator's approved training programme: Provided that such training included at least the number of flight hours as that approved for the operator and, prior to conducting a commercial air transport operation, -

(a) the operator ensures such pilot receives flight training on any differences that may exist between the operator's model of aeroplane and that on which the original training took place, including, at least, safety equipment, systems, engine/airframe, performance and operating characteristics differences;

(b) the operator ensures such pilot receives flight training in the use of any equipment installed in its aeroplanes that was not installed in the other operator's aeroplane on which the training took place, such as navigational aids, auto flight system, flight director/FMS, ACAS, TAWS, weather radar, etc., in each aeroplane pilotis to fly or an approved flight simulation training device (FSTD); and

(c) the operator ensures such pilot receives flight training and becomes proficient in the use of the operator's SOPs in each aeroplane pilotis to fly or an approved full flight simulator (FFS) of the type to be flown.

Notes -

1. *An operator may not have to complete the training on each aeroplane type if training credits have been approved as provided in sub-subsection 2.4.1(4) of TS 135.03.3.*

2. *In the event additional training is required as a result of this technical standard, the operator shall conduct a proficiency check on the pilot following such training to ensure the pilot is familiar with any aeroplane differences and is competent in the use of all aeroplane equipment and the operator's SOPs.*

(5) An operator accepting the training of another operator shall maintain on its training file for such pilot, detailed records of the other operator's and its own training, including at least -

(a) the name of the organisation conducting the training, if other than the operator;

(b) the name of the person having conducted the training and, in the case of flight training, his or her licence number;

(c) the location where the training was completed;

(d) the date the training was completed;

(e) the type, model and registration of the aeroplane on which the flight training or any proficiency check was completed;

(f) copies of ground examinations or other approved means of demonstrating adequate knowledge of the aeroplane and its equipment;

(g) copies of any proficiency checks completed on the pilot; and

(h) verification by the operator that the training was successfully completed.

(6) The operator shall publish procedures in its operations manual to ensure that for each case in which another operator's training is to be accepted, the operator has -

(a) identified what differences exist, if any, between its aeroplanes and those used by the other operator for the training and that such differences have been incorporated into its training programme; and

(b) determined whether or not the SOPs used for the other operator's training are the same as those used by the operator.

2. Approval of contracted training services

An operator may contract any required training to another organisation provided -

(a) the arrangement is clearly provided for in the approved training programme;

(b) the contracted training organisation is the holder of a valid ATO certificate issued in terms of Part 141 or has been otherwise issued approval to conduct training by the Executive Director;

(c) the contracted training organisation uses the manuals and publications approved for use by the operator (standard operating procedures (SOPs), aircraft flight manual (AFM), aircraft operating manual (AOM), if applicable, operator's operations manual, etc.);

(d) the operator ensures that the training is conducted in accordance with the approved programme;

(e) where aeroplane type training is conducted the training is provided on the same type and model aeroplane operated by the operator unless appropriate differences training is provided and described in the approved training programme; and

(f) the operator remains responsible to ensure the training records approved in the operator's training programme are completed by the contracted ATO and maintained in the trainee's file at the base of the operator.

3. Equipment, facilities and personnel of a training programme

An operator shall ensure that its training equipment and facilities and personnel are adequate for their intended purpose.

(a) Equipment - While no specific standards are published for the training equipment used as teaching aids, a benchmark is whether or not the information being presented is done so through the use of adequate training aids so as to make the material understandable to the trainee. Equipment will be assessed against state of the art training aids with reasonable consideration given to the scope and size of the operator.

(b) Facilities - Training facilities, like equipment, are assessed for their suitability by a comparison with state of the art training facilities giving due consideration to the scope and size of the operator. Facilities normally must be such that the trainee will not be distracted from the course material or training aids being displayed and provide an environment conducive to learning. Control over lighting, noise, temperature, location, orientation and general comfort of learning stations and where needed, sound enhancement or amplification must be favourable to a learning environment.

Note - *While no hard benchmarks are imposed for the acceptability of an operator's training equipment and facilities, it will follow that the training times proposed will be assessed in light of the operator's ability to effectively transfer the required information which will in turn depend upon the equipment and/or facilities at the disposal of the training personnel.*

(c) Personnel - The qualifications of training and checking personnel as specified in section 4 of this TS shall be documented by the operator.

4. Use of FFS for training and checking

(1) It is anticipated that in the delivery of its flight training programme an operator will make every reasonable effort to use the most updated FSTDs where such are available to the operator.

(2) Except as provided in paragraphs (4) and (5), the use of a full flight simulator (FFS) of the type to be flown is mandatory for initial and recurrent training and checking on aeroplanes of a maximum certificated mass (MCM) exceeding 15 000kg for the following exercises -

(a) engine failure at V1*;

(b) low and high speed rejected take-offs;

(c) low visibility operations (LVTO, CAT II/III), if applicable*;

(d) asymmetric flap and spoiler deployments;

(e) uncommanded/runaway flap and spoiler deployments;

(f) jammed or inoperative pitch trim (occurring at both high and low speed);

(g) jammed or inoperative primary flight controls;

(h) upset attitude recovery;

(i) uncommanded/runaway auto-flight system control inputs (pitch, roll and yaw);

(j) erroneous pitot-static and gyro instrument indications;

(k) ACAS TAs/RAs*;

(l) TAWS events*;

(m) windshear on final approach and after take-off*;

(n) turbulence penetration and updraft/downdraft;

(o) hydraulic failures (effects on controls, etc.);

(p) engine fire;

(q) electrical failures (effects on systems);

(r) APU fire;

(s) electrical fire;

(t) wheel well fire;

(u) smoke in the cockpit;

(v) asymmetric flaps (zero flaps for some aeroplanes);

(w) maximum crosswind during take-off, landing, and approaches*; and

(x) take-off over/under rotation.

Notes -

1. *All exercises shall be completed to a satisfactory level during an initial training course.*
2. *Exercises with an asterisk shall be satisfactorily demonstrated at least every twelve months.*
3. *Exercises without an asterisk shall be satisfactorily demonstrated at least every 24 months.*
4. *An operator approved for aeroplane grouping as provided in TS 135.03.5(5) of Document NAM-CATS 135 shall alternate the training between the aeroplanes within the group.*

(3) The remainder of the training and checking programme may be accomplished in the aeroplane.

(4) The Executive Director may require a FFS to be used as part or all of the training programme of any aeroplane type or variant where such aeroplane is unusually complex by design or in flying characteristics as compared to an aeroplane of a similar MCM, such that training to address the specific unusual design and/or flying characteristic of the aeroplane cannot properly and safely be carried out without using a FFS.

(5) The Executive Director may permit aeroplane-only training: Provided -

(a) there is no suitable simulator available anywhere;

(b) the FFS is, by virtue of its certification or serviceability, restricted in its training and checking credits; or

(c) the operator or ATO requests an exemption based upon exceptional circumstances.

(6) Reference to a FFS in this technical standard means a FFS of a level required to accomplish the training programme approved for the operator.

5. Qualifications of training and checking personnel

Notes -

1. *Unless otherwise specified, reference to an aeroplane type shall be taken to mean type or variant of that type of aeroplane where applicable.*

2. *Other than regaining qualification training as noted, reference to training and or checking shall be taken to mean initial, upgrade or recurrent training.*

(1) Qualifications of all training personnel

An operator shall select its training personnel based on them having a satisfactory practical and theoretical knowledge of -

(i) the subject(s) the instructor is to teach;

(ii) the aeroplane type(s) the instructor is to teach on, if applicable;

(iii) the basic principles of learning and techniques of instruction;

(iv) preparation and use of lesson plans;

(v) the administrative procedures with respect to the established trainee progress forms;

(vi) briefing and debriefing techniques relative to the training given;

(vii) all associated training devices including applicable FSTDs to be used, if applicable; and

(viii) the procedures established in the training programme for the administration, conduct, review, and correction of, as applicable-

(aa) required examinations or other approved methods of establishing comprehension; and

(bb) skills tests, proficiency or other competency checks.

(2) Qualifications of a ground instructor

Each ground training instructor shall have met the requirements of section 4(1) of this TS and -

(i) unless the pilot is or has been the holder of an instructor rating as provided in these Regulations, have received training on-

(aa) the fundamental principles of the teaching/learning process;

(bb) teaching methods and procedures;

(cc) the instructor/student relationship;

(dd) learning impediments;

(ee) human factors relating to the effects of stress and hazardous attitudes;

(ff) the objectives and standards of the operator's training programme;

(gg) the effective use of training devices used in the programme(s);

(hh) CAR and CATS relating to training requirements; and

(ii) the system of record keeping approved to be used in conjunction with the training programme; and

(ii) if conducting aeroplane type training, have successfully completed the initial and recurrent technical training and testing as applicable for each type of aeroplane or have received training in, or have experience with, the aeroplane system or systems to be taught;

(iii) if conducting aeroplane type training, have a sound knowledge of the SOPs or AOM, as applicable, AFM, manuals for special equipment training and the operator's operations and training manuals, as applicable;

(iv) if conducting training relating to special operations or non-aeroplane specific courses, shall have completed the associated training and testing and be certified by the person responsible for training as competent to teach such subject(s); and

(v) where the type of training includes interfacing with other crew members, an appropriate level of knowledge of the functional manuals assigned to such other crew members.

(3) Qualifications of a flight training pilot

(a) Each flight training pilot who is to conduct training in the aeroplane or both the aeroplane and a FSTD shall have met the requirements of section 4(1) of this TS and -

(i) hold the following licences, ratings and certificates -

(aa) a valid flight instructor rating;

(bb) a valid medical certificate; and

(cc) for aeroplanes with an MCM of greater than 5 700kg, a valid ATPL and a type rating for the type of aeroplane on which training will be given; or

(dd) for aeroplanes with an MCM equal to or less than 5 700kg, a valid CPL and -

(A) if the aeroplane training includes instrument flight training, a valid instrument rating; and

(B) a type rating for the type of aeroplane on which training will be given, if applicable;

(ii) be currently qualified for line flying on the type of aeroplane;

(iii) be qualified to perform PF and PNF duties while occupying either flight crew member seat;

(iv) know the content of the AFM, SOPs or AOM, if applicable, special equipment manuals, as appropriate, operator's operations and training manuals as applicable to the aeroplane type; and

(v) know the relevant provisions of Namibia and where international operations are involved, the foreign regulations.

(b) Each flight training pilot who is to conduct training only in a FSTD shall meet the requirements of paragraph (3)(a) of this section, with the exception of sub-paragraph (a)(i)(bb), in which case the pilot shall either hold or have held an ATPL, and sub-paragraphs (a)(ii) and (iii), and, in addition -

(i) have successfully completed the operator's ground and flight training programme for the type of aeroplane;

(ii) have successfully completed within the past 12 months a PPC in the FFS or aeroplane for that type;

(iii) shall maintain familiarity with the operator's SOPs, in particular changes to the SOPs; and

(iv) have received instruction from and demonstrated the ability to operate the FSTD to a suitably qualified instructor.

(4) Qualifications of pilot checking personnel

A person authorised to conduct pilot PPCs shall -

(i) in the case of a PPC conducted by a flight training pilot qualified on the aeroplane or the aeroplane and the FFS -

(aa) have met all the qualification requirements specified in sections 4(1) and 4(3)(a) of this TS;

(bb) for PPCs involving an initial issue or revalidation of an instrument rating or an initial issue of a multi-engine piston class rating or turbine rating, be the holder of a DFE authority issued by the Executive Director appropriate to the aeroplane in which such PPC is to be conducted and for all other PPCs, be an approved current Grade I or Grade II flight instructor qualified on that aeroplane;

(cc) have been monitored in the preceding 12 months conducting a PPC, in at least one of the aeroplane types for which the authority is being sought -

(A) for DFEs, by a NCAA inspector or, in exceptional circumstances, another DFE approved by the Executive Director; and

(B) for flight instructors, by a DFE;

(dd) hold a valid medical certificate;

(ee) have completed the operator's training programme and be qualified as a line captain; and

(ff) be qualified to perform PF and PNF duties while occupying either flight crew member seat;

(ii) in the case of a PPC conducted by a FFS-only qualified flight training pilot, have met all the qualification requirements specified in sections 4(1), 4(3)(b) and 4(4)(a)(i) (with the exception of sub-paragraphs (a)(i)(aa) and (ee) above;

(iii) in the case of line checks performed by company check pilots (CCPs) -

(aa) for an aeroplane with an MCM less than 8618kg, hold a valid ATPL;

(bb) hold a valid medical certificate;

(cc) have adequately demonstrated competency in terms of TS 135.03.3;

(dd) have completed the operator's training programme, be current and be qualified as a line captain on the aircraft type on which the line check will be given;

(ee) be qualified to perform PF and PNF duties while occupying either flight crew member seat;

(ff) be certified in his or her training file as authorised by an operator to conduct line checks as specified in such certification;

(gg) hold a valid Instrument Rating;

(hh) have knowledge of the Standard Operating Procedures, AFM, MEL and special equipment manuals, operations and training manuals applicable to the operation;

(ii) have practical and theoretical knowledge of the administrative procedures and records management system applicable to the operator and approved in conjunction with the training program.

Note - *The operator shall retain a copy of all authorisations in the pilot's training record.*

(5) Training for other than crew members

Training for ground personnel whose function is essential to the safety of flight operations shall be conducted by a competent person assigned by the manager responsible for the department to which such ground personnel are assigned. Specific qualifications for such instructors shall be published in the operator's operations manual.

6. Training records

(1) Every operator shall, for each person who is required to receive training in terms of Subpart 3, establish and maintain a record of -

(a) the person's name and, where applicable, licence number, type and ratings;

(b) if applicable, the person's medical category and the expiry date of that category;

(c) for pilots, the latest date any training for an initial type rating or for regaining qualification, as contemplated in Document NAM-CATS 135.03.3, was completed, whether or not such training was completed while in the employ of the operator.

(d) the dates on which the person, while in the operator's employ, successfully completed any training, proficiency check or examination required in terms of Subpart 3 or obtained any qualification required in terms of this Part, Part 61 or Part 64, as applicable;

(e) information relating to any failure of the person, while in the operator's employ, to successfully complete any training, proficiency check or examination required in terms of Subpart 3, or to obtain any qualification required in terms of Part 61, 63 or 64 or this TS; and

(f) the type of aircraft or flight training device used for any training, proficiency check, line check or qualification required under this Subpart.

(2) An operator shall retain a copy of the most recent written examination completed by each person for each subject for which an examination is required.

135.03.2 APPROVAL OF TRAINING PROGRAMME

1. Approval process of an operator training programme

(1) The procedures contained in this TS have been established for the initial approval of an operator's training programme or the introduction of new equipment. The subsequent approvals of training programme amendments will normally be a one-phase process consisting of final approval.

(2) Unless the training programme is contained in the company operations manual, each operator shall submit two complete copies of its proposed training programme along with a list of effective pages to the Executive Director for review and approval.

(3) Where in the opinion of the Executive Director the proposed programme has been presented in sufficient detail to enable him or her to make a preliminary evaluation and determine the programme meets the requirements of these technical standards, an initial approval of the training programme will be given. One copy of the programme will be returned along with a copy of the list of effective pages which will bear an initial approval stamp. The operator is then authorised to present the programme.

(4) Where insufficient detail has been provided the Executive Director may return the training programme either in whole or in part for further development.

(5) The initial approval referred to in paragraph (2) will normally be given for an initial period of one year during which time the programme will be monitored in sufficient depth to enable a final decision to be made with respect to the effectiveness of the programme in terms of meeting the established training goals.

(6) When the Executive Director is satisfied that the training programme meets the requirements of this technical standard, a final approval will be issued.

(7) After the initial approval has been received but before the final approval has been issued, each operator is required to advise the Executive Director within seven days of the intention to present the training programme. Unless otherwise advised, the operator shall make accommodation for an inspector to attend.

135.03.3 FLIGHT CREW MEMBER TRAINING

1. . . .

2. Required training for all operators

2.1. Company Induction

(1) Company induction is required only upon initial employment for all flight crew members except where changes in the company are sufficient enough that the Executive Director may require supplemental training for existing flight crew members.

(2) The programme shall ensure that persons involved in flight operations are aware of their responsibilities, know company reporting relationships and are competent to fulfil their assigned duties as related to flight operations.

2.2. Crew resource management training

(1) An operator shall ensure a flight crew member has received crew resource management (CRM) training including human factors, risk analysis and error and threat management training -

(a) upon initial appointment to the operator unless such person has, within the preceding 12 months, received CRM training from another approved training organisation. In such cases, the operator shall provide the flight crew member with training in those elements of CRM that are company-specific; and

(b) on a recurrent basis every 12 months thereafter.

(2) CRM training shall include at least classroom lectures and practical exercises. The use of group discussions as forums to problem solving or accident reviews to analyse the human factors breakdown as possible contributing or causal factors contributes significantly to CRM training.

(3) An operator may use a course provided by another operator, if that course has been approved by the Executive Director and the training agreement between the operator

and the service provider complies with the requirements as prescribed in TS 135.03.2.

2.3. Cabin safety, emergency equipment and security training

(1) An operator shall ensure that each flight crew member undergoes training and checking on the location and use of all emergency and safety equipment carried on board the operator's aeroplanes and emergency evacuation training -

(a) upon initial employment by the operator and for each aeroplane type to which the flight crew member is assigned that may employ different equipment or procedures unless such person has, within the preceding 12 months, received such training from another approved training source. In such cases, the operator shall provide the flight crew member with training in those elements of cabin safety, emergency equipment and security procedures that are company-specific; and

(b) on a recurrent basis every 12 months thereafter, consisting of items from the initial programme that may have changed since the last training session.

(2) Training devices approved to simulate flight operating emergency conditions. Static aeroplanes, ground demonstrations, classroom lectures or online e-learning where adequate visual aids are provided, films or other devices may be used for training: Provided the method used ensures that each crew member is adequately trained in the operation or use of all emergency equipment.

(3) Each flight crew member shall be trained in the operator's security policies and procedures and, in particular, the procedures associated with hijacking, bomb threats and unlawful interference.

2.4. Aeroplane type initial and recurrent ground and flight training

2.4.1. General

(1) An operator shall provide each flight crew member with ground and flight training on each aeroplane type to be flown as follows -

(a) upon initial appointment of the flight crew member by the operator to an aeroplane for which the flight crew member does not have that type rating or has a newly acquired type rating but no experience on that type; and

(b) on a recurrent basis every 12 months thereafter, unless otherwise approved by the Executive Director based on training credits for similar aeroplane types as provided in paragraph (4).

(2) A flight crew member joining an operator with a type rating and experience on the aeroplane to be operated with that operator, shall undergo the operator's recurrent ground and flight training programme, including sufficient training to ensure the pilot is familiar with the

operator's aeroplanes and standard operating procedures. A proficiency check shall be completed following such training.

Note - *For the purposes of this TS, a pilot is deemed to have "experience" if such pilot has accumulated at least 25 hours on the type of aeroplane.*

(3) An operator need not administer a complete initial type training programme to a pilot coming to the operator with a newly acquired type rating and no experience on that type: Provided -

(a) the operator provides the following ground training to the pilot prior to conducting a commercial air transport operation -

(i) in the event the operator's aeroplanes are different models than those upon which the pilot's ground training was based, the operator ensures such pilot receives additional training covering any differences between the models, including, at least, safety equipment, systems differences, engine/airframe limitations, performance considerations and operating characteristics;

(ii) in the event the operator's aeroplanes are equipped with different ancillary equipment than those upon which the pilot's ground training was based or not given, such as navigational aids, auto flight system, flight director/flight management system (FMS), airborne collision avoidance system (ACAS), terrain awareness and warning system (TAWS), weather radar, etc., the operator shall provide training on such equipment; and

(iii) the operator establishes that the pilot has adequate knowledge of the different models of aeroplanes and equipment noted in sub-sub-paragraphs (i) and (ii) above;

(b) the operator provides the following flight training to the pilot prior to conducting a commercial air transport operation -

(i) flight training on any differences that may exist between the operator's model of aeroplane and that on which the initial training took place, including, at least, systems, engine/airframe, performance and operating characteristics differences;

(ii) flight training in the use of any equipment installed in the operator's aeroplanes that was not installed in the aeroplane on which the initial training took place, such as navigational aids, auto flight system, flight director/FMS, ACAS, TAWS, weather radar, etc., in the aeroplane or an approved flight simulation training device (FSTD); and

(iii) sufficient flight training in the aeroplane or an approved full flight simulator (FFS) of the type to be flown to ensure the pilot becomes proficient in the use of the operator's SOPs;

Notes -

1. An operator may not have to complete the training on each aeroplane type if training credits have been approved as provided in paragraph (4) of this sub-subsection.

2. In the event additional training is required as a result of this technical standard, the operator shall conduct a proficiency check on the pilot following such training to ensure the pilot is familiar with any aeroplane differences and is competent in the use of all aeroplane equipment and the operator's SOPs.

(c) the operator shall maintain on its training file for each pilot arriving with a newly acquired type rating, detailed records of the initial training received and its own training, including at least -

(i) the name of the organisation having conducted the training, if other than the operator;

(ii) the name of the person having conducted the training and, in the case of flight training, his or her licence number;

(iii) the location where the training was completed;

(iv) the date the training was completed;

(v) the type, model and registration of the aeroplane on which the flight training or any proficiency check was completed;

(vi) copies of ground examinations or other approved means of demonstrating adequate knowledge of the aeroplane and its equipment;

(vii) a copy of the pilot's type rating skills test; and

(viii) verification by the operator that the training was successfully completed;

(d) the operator shall publish procedures in its operations manual to ensure that for each case in which a pilot claims credit for a newly acquired type rating, the operator has -

(i) verified the veracity of the type rating endorsement;

(ii) identified what differences exist, if any, between its aeroplanes and those used for the initial training and that such

differences have been incorporated into its training programme; and

(iii) determined whether or not the SOPs used for the initial training are the same as those used by the operator; and

(e) the pilot undergoes the full line induction training programme as specified in subsection 2.1 of this TS.

(4) An operator may be permitted training credits for different types or variants of aeroplanes based on the demonstrated similarities between the aeroplanes, hereinafter referred to as "aeroplane grouping". Notwithstanding approved aeroplane grouping, the initial training shall be completed on each type of aeroplane operated and the subsequent training shall be accomplished on a rotating basis between the aeroplanes involved. For the purposes of this TS and regulation 135.03.7(1)(d), recurrent training completed on one aeroplane type shall be deemed to have been completed on all aeroplane types for which aeroplane grouping has been approved.

2.4.2. Ground Training

(1) Initial aeroplane type ground training shall consist of a detailed programme covering at least -

(a) all of the aeroplane's systems and their associated limitations, if any;

(b) the aeroplane's normal, abnormal and emergency procedures;

(c) the mass and balance and performance data and calculations; and

(d) the aeroplane's emergency equipment.

Note - *Initial ground training involving emergency equipment may be restricted to the identification of what equipment is on board the aeroplane and its location. Emergency equipment use and practical demonstration requirements are covered under subsection 2.3.*

(2) Recurrent ground training shall consist of a review of such of the subjects outlined in an initial training programme that would ensure critical information is reviewed timeously, including any changes to the aeroplane or operating procedures that occurred since any previous training.

(3) Comprehension examinations shall be administered and successfully completed by the trainee following any ground training and prior to advancing to the next phase of learning.

2.4.3. Flight Training

Note - *For the purposes of this TS, "zero flight time training" means that training on an actual aeroplane is not required.*

(1) The operator shall specify the training syllabi and proposed training times in its operations manual.

(2) Refer to TS 135.03.1 paragraph 3 for the requirements for mandatory FSTD use.

(3) The training times allocated to initial and recurrent flight training shall not be less than -

(a) for initial flight training -

Notes -

1. *The initial training times in the following table are based on a complete type-rating course as well as training required by these Regulations and may be reduced to not less than ½ of the minimum time based on pilot experience, subject to the Executive Director's prior approval.*

2. *Refer to sub-subsection 2.4.1(3) of this TS for initial training requirements for a pilot who comes to the operator with a newly acquired type rating and no experience on that type.*

Certificated Passenger Seating Capacity / MCM	Flight Training (PF Hours)[1]			
	Simulator and Aircraft		Level D[2] (simulator only)	Level E[2] (aeroplane only)
	Level A, B or C[2]	Aircraft		
Single-engine	4.0	1.0[3]	4.0	4.0
Multi-engine <10 pax	6.0	1.5[3]	6.0	6.0
Multi-engine ≥10 - <20 pax MCM ≤ 8618 Kg and Cargo-only MCM ≤ 8618 kg	10.0	2.0[3]	10.0	10.0
Multi-engine ≥10 – <20 pax MCM>8 618kg	10.0	2.0 [3]	12.0	12.0

(b) for recurrent flight training –

Maximum Certificated Mass	Flight Training (PF Hours)[1] (except as approved in an advanced qualification programme)		
	Simulator and Aircraft	Level D[2]	Level E[2]

	Level A, B or C[2]	Aircraft	(simulator only)	(aeroplane only)
Single-engine	1.5[4]	1.0[3]	1.5[4]	1.5[4]
Multi-engine ≤15000 kg	2.0	1.0[3]	2.0	2.0
Multi-engine >15000 kg	4.0	1.5[3]	4.0	4.0

Notes *(applicable to both tables) -*

1. *Flight training times in the tables are expected to be flight times (block to block). 15 minutes is factored into the ground time for each flight. Time spent in excess of 15 minutes on the ground is to be added to the air time spent in training for aeroplane-only training. Recurrent flight training is an annual requirement. Pilots shall complete an equal amount of pilot not flying (PNF) time in addition to the pilot flying (PF) times given in the tables.*

2. *The times specified refer to the level of the training programme approved in accordance with sub-subsection 2.4.3(4)(a) of this TS. FSTDs approved as part of such training programmes include-*

   (1) Level A Full Flight Simulator (FFS) - a synthetic training device that has a motion and visual system that permits completion of a visual training programme and PPC. However, the sophistication of the device is such that there is also a requirement to complete airborne training and an airborne PPC following initial training. Recurrent training and PPCs may be conducted wholly in a Level A device, if approved by the Executive Director;

   (2) Level B FFS - a synthetic training device that has a higher fidelity visual and motion system than that of a Level A device. The system allows the device to accurately replicate aircraft handling when within ground effect and permits accurate depth perception and visual cues to assess sink rate. As a result, it has "landing credits" attached to it. All recurrent training and 90 day currency requirements may be completed in a Level B or higher synthetic training device; and

   (3) Level C and D FFS - synthetic training devices that have a much higher level of fidelity in their visual and motion systems compared to Level B simulators. Zero flight time may training be authorised for programmes utilising a Level D FFS.

3. May be reduced to that time necessary to complete the following: Provided all other training has been completed in a FFS -

(1) one normal and one balked landing;

(2) one take-off with engine failure after the gear is up (except single-engine aeroplanes);

(3) one full stop landing with simulated engine failure (except single-engine aeroplanes); and

(4) one other landing of any type (flapless, from an IFR approach, etc.).

4. For VFR-only operations, the flight time may be reduced by one hour.

(4) Initial and recurrent flight training for flight crew members

(a) Flight training for flight crew members shall be carried out in accordance with one of the following types of training programmes for each aeroplane type operated by the operator -

(i) level A training programme;

(ii) level B training programme;

(iii) level C training programme;

(iv) level D training programme; or

(v) level E aeroplane-only flight training programme,

as described in sub-subsections 2.4.3(8) through (12) of this TS.

(b) Where an operator utilises an FSTD other than those included in the flight training programmes specified in subparagraph (a), the Executive Director shall make a determination with respect to the training and checking credits allowed for such FSTD on a case-by-case basis.

(5) Recurrent training for all flight crew members shall meet the following requirements -

(a) all items identified in the initial training syllabus shall be covered over a defined period of time (through a cycle); and

(b) a briefing shall be provided on changes that have occurred to the aeroplane or its operation since the flight crew member's last training.

(6) Each operator shall publish a flight training syllabus containing all items and manoeuvres outlined in the applicable training programme unless the

training is contracted out, in which case the training syllabus of the contracted agency shall be published and available to the operator's flight crew members.

(7) The flight training syllabus referred to in paragraph (6) shall incorporate training sequences that reflect -

(a) the type of operation, whether VFR, IFR or both;

(b) the type of aeroplane and the equipment carried on board; and

(c) the flight regime in which operated.

(8) Level A aeroplane type training programme

(a) A Level A training programme shall provide for flight training using a combination of an approved Level A FFS of the type of aeroplane to be operated and the aeroplane. The operator is permitted to conduct most of the training elements of an initial and recurrent training programme in that simulator. Flight training in an aeroplane shall be carried out for general handling and landing manoeuvres following training as specified in sub-paragraph (c) below.

(b) Flight training shall include and be in accordance with all flight profiles published by the manufacturer, when such profiles are published, including training in normal, abnormal and emergency operation of the aeroplane systems and components using the FFS. For operators of aeroplanes for which standard operating procedures (SOPs) are required, the training shall be given using such SOPs.

(c) In addition to the training in a Level A FFS following initial training and, if required, recurrent training, at least 3 take-offs and landings and the following items and manoeuvres shall be completed in the aeroplane -

(i) interior and exterior aeroplane pre-flight checks;

(ii) ground handling for pilots-in-command only, unless the aeroplane provides full steering capability from the second-in-command (SIC) flight crew stations and company procedures permit the SIC to conduct taxi operations;

(iii) normal take-off, visual circuit, where possible, and landing;

(iv) a full circling approach off an instrument approach to circling minima where the flight crew member is authorised to perform circling manoeuvres;

(v) a simulated engine failure procedure after take-off (at safe altitude and airspeed);

(vi) a normal missed approach;

(vii) a simulated engine inoperative landing; and

(viii) any other manoeuvre for which the simulator was not given training credits.

(d) If a Level A flight simulator has differences in performance, systems or cockpit layout and configuration from the operator's aeroplane, additional training on these differences shall be provided either in the aeroplane or a training device that is representative of the operator's actual aeroplanes and is approved for use by the Executive Director.

(9) Level B aeroplane type training programme

(a) A Level B training programme shall provide for flight training using an approved Level B FFS of the type of aeroplane to be operated. Additionally, initial flight training in an aeroplane shall be carried out for ground handling, landing manoeuvres and any other manoeuvre for which the Level B FFS has not been given a training and checking credit and shall include, as a minimum, interior and exterior aeroplane pre-flight checks. Flight training in the aeroplane following recurrent FFS training need not be completed.

(b) In addition to the training required in a Level A training programme, training in an approved Level B FFS shall include recovery from turbulence and windshear on take-off and approach.

(c) If a Level B flight simulator has differences in performance, systems or cockpit layout and configuration from the operator's aeroplane, additional training on these differences shall be provided either in the aeroplane or a training device that is representative of the operator's actual aeroplane and is approved for use by the Executive Director.

(10) Level C aeroplane type training programme

(a) A Level C training programme shall provide for flight training using an approved Level C FFS of the type of aeroplane to be operated. Except as provided in sub-paragraph (b), initial flight training in an aeroplane shall be carried out for ground handling, landing manoeuvres and any other manoeuvre for which the Level C FFS has not been given a training and checking credit and shall include, as a minimum, interior and exterior aeroplane pre-flight checks. Flight training in the aeroplane following recurrent FFS training need not be completed.

(b) Zero flight time training for candidates undergoing initial training with at least second-in-command experience on a similar aeroplane with the same operator or has otherwise had verifiable line currency as at least a second-in-command on a similar aeroplane within the previous two years is permitted.

Note - *For the purpose of this provision, "similar aeroplane" means both aeroplanes are operated in terms of Part 135 and are within the following categories -*

1. turbo-jet to turbo-jet;

2. turbo-prop to turbo-prop; and

3. reciprocating to reciprocating.

(c) If a Level C flight simulator has differences in performance, systems or cockpit layout and configuration from the operator's aeroplane, additional training on these differences shall be provided either in the aeroplane or a training device that is representative of the operator's actual aeroplanes and is approved for use by the Executive Director.

(11) Level D aeroplane type training programme

(a) A Level D training programme using an approved Level D FFS of the type of aeroplane to be operated permits zero flight time training.

(b) If a Level D flight simulator has differences in performance, systems or cockpit layout and configuration from the operator's aeroplane, additional training on these differences shall be provided either in the aeroplane or a training device that is representative of the operator's actual aeroplane and is approved for use by the Executive Director.

(12) Level E aeroplane-only flight training programme

(a) An aeroplane-only flight training programme will only be approved in accordance with the simulator-use policy specified in section 3 of TS 135.03.1 of Document NAM-CATS 135.

(b) Any simulated failure of aeroplane systems shall only take place under operating conditions which do not jeopardise safety of flight and never with passengers on board.

(c) The training programme shall include and be in accordance with all flight profiles published by the manufacturer, when such profiles are published, including SOPs for normal, abnormal and emergency operation of the aeroplane systems and components.

2.5. Regaining recency training for pilots

The following training shall be completed by pilots who have not maintained, for a period between 90 and 180 days, their recency qualifications as specified in CAR 91.02.4 -

(a) a briefing on changes that have occurred to the aeroplane or its operation since the pilot's last flight; and

(b) training in an aeroplane or FFS that includes not less than 3 take-offs and landings and, for multi-engine aeroplanes, an engine failure on take-off, an engine failure on the missed approach and an engine-out landing.

Note - *The engine-out training exercises shall be simulated in the aeroplane*.

2.6. Regaining qualification training for pilots

(1) Where a pilot's PPC or competency check (CC) on a specific aeroplane type has expired for less than 6 months, the following shall be completed -

(a) all the requirements specified in sub-subsection 2.5 of this TS, as applicable; and

(b) any recurrent training that may have come due during the absence from flying duties on that aeroplane type.

(2) Where the PPC or CC on a specific aeroplane type has expired from between 6 and 24 months, inclusive, the following shall be completed to regain qualification -

(a) all the requirements of sub-subsection 2.6(1) of this TS; and

(b) a technical ground training course consisting of an aeroplane system review on that aeroplane type.

(3) A pilot whose PPC has expired by more than 24 months but less than 60 months shall complete aeroplane ground technical training and an examination. In addition, the operator shall provide sufficient flight training to ensure the pilot is proficient on the aeroplane, followed by a PPC. In developing the training programme, the operator shall take cognisance of at least -

(a) the time since the pilot last flew the aeroplane type; and

(b) the experience of the pilot on that type and/or similar aeroplanes.

Note - *In each instance of a pilot regaining qualification under paragraph (3), the operator shall submit its proposed flight training programme, including the number of flying hours planned, along with substantiation for arriving at that figure, to the Executive Director for approval prior to conducting the training. The Executive Director shall, within 48 hours, approve, approve with conditions or not approve the programme. Alternatively, the operator may publish in its operations manual several training programmes catering to a variety of scenarios of pilot experience*.

(4) A pilot whose PPC has expired by 60 months or more shall complete the full initial aeroplane type training programme.

3. Required training for operators - as applicable to the operation

3.1. Line induction training - large aircraft

(1) An operator shall ensure that, following completion of initial type rating or upgrade training, each flight crew member appointed by it to operate large aeroplanes completes line induction training. The flight crew member shall serve in the capacity to be served with the operator over routes typical of those over which the flight crew will be expected to fly for the operator. Those items that cannot be covered as a natural occurrence during the line flying operations shall be covered by briefing or other discussion.

(2) Line induction for flight crew members sectors/hours requirements

(a) For the purposes of this TS, the aeroplane groups are -

(i) reciprocating engine;

(ii) turbo-propeller engine; or

(iii) turbo-jet engine.

(b) Initial line induction is required for crew members who have not qualified and served in the same capacity on the same group of aeroplanes.

(c) Transition line induction is authorised for crew members who have qualified and served in the same capacity on the same group of aeroplanes.

(d) During line induction, a flight crew member shall be given the minimum flight times and sectors in accordance with this TS while performing the duties appropriate to the crew station. Line induction training is calculated by a combination of flight hours and flight sectors. A flight sector is considered as any flight consisting of a take-off, enroute segment of not less than 50 nautical miles and an approach and landing. The required number of flying hours and sectors may be completed during proving or ferry flights or during normal line operations and apply to the PIC and the SIC.

(e) Initial line induction shall be conducted under the supervision of a flight training pilot during which time the PIC and SIC shall perform their duties in their respective position, with the training pilot occupying the opposite pilot operating position.

(f) Initial or upgrade line induction requires that the PIC and SIC receive not less than 4 flight sectors, 2 sectors of which are to be performed as PF and 2 sectors as PNF;

(g) Initial or upgrade line induction requires that each flight crew member receives the following minimum number of flight hours -

(i) in the case of large aeroplanes with reciprocating engines -

(aa) 10 hours; and

(bb) after completing the 4 mandatory sectors, the remaining time may be reduced by 1 hour for each additional sector flown to a maximum reduction of 5 hours;

(ii) in the case of large aeroplanes with turbo-propeller engines -

(aa) 15 hours; and

(bb) after completing the 4 mandatory sectors, the remaining time may be reduced by 1 hour for each additional sector flown to a maximum reduction of 7.5 hours; and

(iii) in the case of large aeroplanes with turbo-jet engines -

(aa) 25 hours; and

(bb) no reduction of the original time requirement shall be permitted.

(h) Transition line induction requires that each flight crew member receives, in the case of the PIC and SIC, not less than 3 flight sectors of which at least 1 sector is to be performed as PF and 1 sector as PNF.

(i) Transition line induction requires that each flight crew member receives the following minimum number of flight hours -

(i) in the case of aeroplanes with reciprocating engines -

(aa) 10 hours; and

(bb) after completing the 3 mandatory sectors, the remaining time may be reduced by 1 hour for each additional sector flown to a maximum reduction of 5 hours;

(ii) in the case of aeroplanes with turbo-propeller engines -

(aa) 15 hours; and

(bb) after completing the 3 mandatory sectors, the remaining time may be reduced by 1 hour for each additional sector flown to a maximum reduction of 7.5 hours; and

(iii) in the case of aeroplanes with turbo-jet engines -

(aa) 20 hours; and

(bb) after completing the 3 mandatory sectors, the remaining time may be reduced by 1 hour for each additional sector flown to a maximum reduction of 10 hours.

3.2. Differences and familiarisation training

(1) Where the operator intends to assign a flight crew member to variant types of aeroplanes or different types with very similar characteristics, the operator shall, using TS 61.17 in Document NAM-CATS 61 for guidance, determine whether the pilot must be provided differences or familiarisation training.

(2) Where significant differences exist within the operator's fleet of aeroplanes, or variants of aeroplanes, or between the aeroplanes operated and the training device approved for use, the aeroplane type technical and flight training syllabus shall contain such differences training.

(3) Where only minor differences exist within the operator's fleet of aeroplanes, or variants of aeroplanes, or between the aeroplanes operated and the training device approved for use, the aeroplane familiarisation training appropriate to the differences shall be given and recorded in the crew member's training file.

(4) Differences and familiarisation training shall include, as a minimum, a knowledge examination following the ground training. The requirement for a skills test will be determined by the Executive Director based upon an assessment of the degree of the differences.

3.3. Upgrade training

(1) Where an operator wishes to appoint the following persons as a PIC on an aeroplane type, such person shall undergo upgrade training -

(a) an SIC who is currently proficient as an SIC on the type of aeroplane;

(b) an SIC who is not qualified on the type of aeroplane; or

(c) an SIC who is qualified on the aeroplane type and has acted as PIC on another aeroplane type.

(2) Where an SIC holds a type rating on the aeroplane and whose SIC proficiency on that aeroplane has expired within the preceding 24 months, such SIC shall complete a technical ground training course consisting of an aeroplane system review on that aeroplane type prior to or as part of the upgrade training programme.

(3) Prior to or included in the training required by paragraph (1) above, pilots who have not held a valid SIC PPC on the aeroplane type for a period greater than 24 months shall be given a complete initial aeroplane type training course: Provided that a reduction in the ground training and minimum flight hours required may be granted by the Executive Director based on the experience of the flight crew member on that aeroplane type.

3.4. Pilot qualification to operate in either pilot seat

(1) A pilot whose duties also require him or her to carry out the duties of PF and PNF from both flight crew stations shall complete additional training and become competent to operate from both seats.

(2) The training required by paragraph (1) shall be completed upon initial assignment and every 12 months thereafter unless the pilot has completed all of the training elements specified in the training programme during normal line operations within the preceding 12 month period prior to operating from a seat for which the pilot was not previously qualified.

(3) A record of the training completed and/or operational means of qualifying to act from either flight crew station shall be maintained in the pilot's training file.

3.5. Area, route and aerodrome familiarisation training

An operator shall provide adequate material to enable a PIC to familiarise him or herself with such areas, routes and aerodromes as that person is likely to use and shall ensure such material is kept up-to-date.

3.6. Airborne collision avoidance system (ACAS) training

(1) ACAS training is applicable to flight crew members where the aeroplane is required to be operated with an approved, serviceable ACAS and shall be completed -

(a) prior to initial operational use of the ACAS; and

(b) as part of the aeroplane recurrent ground and flight training programme as specified in paragraph (6) of this TS.

(2) An ACAS training programme shall ensure that on completion the pilot is able to demonstrate proficiency in the following -

(a) knowledge of ACAS concepts, systems and procedures specific to the type of equipment used by the operator; and

(b) cognitive, procedural, and motor skills necessary to properly respond to ACAS advisories.

(3) A pilot must complete ACAS initial training in respect of each aeroplane type for which the pilot is rated in which is carried ACAS equipment.

(4) ACAS initial training may be provided as a stand-alone module of ground and flight training or may be integrated with other initial, transition or upgrade ground and flight training programmes.

(5) An operator shall certify in the pilot's file that the ACAS training has been accomplished to a satisfactory standard.

(6) ACAS renewal training

(a) ACAS renewal training -

(i) shall be integrated with the annual recurrent flight training programme; and

(ii) recurrent ground training shall be provided on an as-required basis if any significant issues have been identified as a result of line operating experience, system changes, procedural changes, or new aircraft display systems have been introduced.

(b) Routine ACAS operations shall be included in all evaluation environments and training pilots should include ACAS as a routine discussion item.

(c) An ACAS instructor is deemed to have completed ACAS renewal training when the instructor conducts ACAS initial training or ACAS renewal training.

(7) ACAS training programme requirements

(a) Each ACAS curriculum shall ensure the equipment manufacturers recommended training and testing requirements are carried out in the manner prescribed by such manufacturer.

(b) In any case a pilot's ability to demonstrate system and procedural concepts shall be included in the initial, recurrent and where applicable, the regaining competency training.

3.7. Reduced Vertical Separation Minima (RVSM) training

(1) No pilot may operate in RVSM airspace unless such pilot has received initial training from an approved training organisation or through an operator's approved training programme with respect to operating in RVSM airspace and, for pilots who have not operated in RVSM airspace in the preceding 12 months, recurrent training.

(2) For a flight crew member to qualify for operations in RVSM airspace, the pilot shall be proficient in the following areas -

(a) knowledge of the floor, ceiling and horizontal boundaries of the RVSM airspace to be operated in;

(b) rules on exclusion of non-RVSM compliant aircraft;

(c) pilot procedures with respect to -

(i) pre-flight and in-flight altimeter checks;

(ii) use of the automatic altitude control system;

(iii) minimum equipment list (MEL) items applicable to RVSM operations;

(iv) special procedures for in-flight contingencies;

(v) weather deviation procedures;

(vi) track offset procedures for wake turbulence and inconsequential collision avoidance systems alerts; and

(vii) climb and descent procedures and pilot level-off call;

(d) procedures for flight of non-RVSM compliant aircraft for maintenance, humanitarian or delivery flights; and

(e) use of ACAS/TCAS.

3.8. Training for low visibility operations

(1) General

(a) Low visibility operations (LVO) are comprised of lower-than-normal visibility minima take-off (LVTO) and lower-than-normal weather and visibility minima approach operations (Category II and III (CAT II/III) approaches).

(b) An operator must ensure that flight crew member training programmes for LVO include structured courses of ground, simulator and flight training. The training is aeroplane-specific; however, credits may be given from one aeroplane type to another based on the similarities between the types. The operator may abbreviate the course content as prescribed by sub- paragraphs (d), (e) and (f) below provided the content of the abbreviated course is acceptable to the Executive Director.

(c) Flight crew members with no CAT II or III experience must complete the full training programme prescribed in paragraphs (2), (3) and (4) below.

(d) Flight crew members with CAT II or III experience with another owner or operator may undertake an abbreviated ground training course but shall complete the flight training, check and line flying under supervision.

(e) Flight crew members with CAT II or III experience with the owner or operator may undertake an abbreviated ground, simulator and/or flight training course, which shall include at least the requirements of paragraphs (5)(a) or (b), as appropriate, of this subsection.

(2) Ground training

An operator shall provide a ground training programme commensurate with its approvals. Such training shall be given to flight crew members upon their initial introduction to LVTO or CAT II/III operations and thereafter as required to introduce new policies, procedures or equipment associated with LVO.

(3) Flight training

(a) An operator shall use an approved simulation training device (FSTD) for the training and checking of flight crew members in LVO.

(b) An operator must ensure that each flight crew member is trained to carry out his or her duties and instructed on the coordination required with other flight crew members.

(4) Conversion training requirements to conduct low-visibility take-off and Cat II and III operations

An operator must ensure that each flight crew member completes the following low visibility procedures training if converting to a new type or variant of aircraft in which LVTO and CAT II and III operations will be conducted. The flight crew member experience requirements to undertake an abbreviated course are prescribed in paragraphs (1)(d) and (e) above.

(a) Ground training -

The appropriate requirements prescribed in paragraph (2) above shall be completed, taking into account the flight crew member's LVTO and CAT II and III training and experience.

(b) FSTD training -

(i) a minimum of 8 LVTO departures and CAT II/III approaches in a simulator approved for the purpose;

(ii) a minimum of 5 landings following CAT II/III approaches of which at least 2 shall be with an engine out;

(iii) a minimum of 3 missed approaches initiated at various stages of the approach, during which at least one engine failure shall be introduced; and

(iv) appropriate additional training if any special equipment is required such as head-up displays or enhanced vision equipment.

(5) Line flying under supervision

An operator must ensure that each flight crew member undergoes the following line flying under supervision -

(a) for CAT II when a manual landing is required, a minimum of 3 landings from autopilot disconnect; and

(b) for CAT III, a minimum of 3 auto-lands except that only 1 auto-land is required when the training required in paragraph (3) or (4), as applicable, has been carried out in a full flight simulator usable for zero flight time training.

(6) Type and command experience

(a) The following additional requirements are applicable to pilots-in-command who are new to the aircraft type -

(i) 50 hours or 20 sectors, whichever is later, as pilot-in-command on the type before performing any CAT II or III operations; and

(ii) 100m must be added to the applicable CAT II or III RVR minima unless the pilot has previously qualified for CAT II or III operations

with another owner or operator until attaining 100 hours or 40 sectors, whichever is later, as pilot-in-command on the type.

(b) The Executive Director may authorise a reduction in the above command experience requirements for flight crew members who have CAT II or III command experience.

(7) LVTO

(a) An operator must ensure that prior to authorisation to conduct take-offs with RVR below 400m the following training is carried out -

(i) normal take-off in minimum authorised conditions or RVR conditions;

(ii) take-off in minimum authorised conditions or RVR conditions with an engine failure between V1 and V2 or as soon as safety considerations permit; and

(iii) take-off in minimum authorised conditions or RVR conditions with an engine failure before V1 resulting in a rejected take-off.

(b) An operator shall ensure that the training required by paragraph (3) or (4) above, as appropriate, above is carried out in an approved simulator. This training shall include the use of any special procedures and equipment.

(c) An operator must ensure that a flight crew member has completed a check before conducting low visibility take-offs with an RVR of less than 400m.

(8) LVO recurrent training and checking

(a) An operator must ensure that, in conjunction with the normal recurrent training and PPCs, a pilot's knowledge and ability to perform the tasks associated with the particular category of operation, including LVTO, for which the pilot is authorised, is checked. The required number of approaches to be conducted during such recurrent training is to be a minimum of two, one of which is to be a missed approach and at least one low visibility take-off to the lowest applicable minima. The period of validity for this check shall be the same as the recurrent training approved for the operator.

(b) For LVO training and checking, an operator shall use an approved flight simulator.

(c) An operator must ensure that, for CAT III operations on aeroplanes with a fail passive flight control system, a missed approach is completed at least once every 18 months as the result of an autopilot failure at or below decision height when the last reported RVR was 300m or less.

(9) LVTO and CAT II or III recency requirements

(a) An operator must ensure that, in order for pilots to maintain a CAT II or III qualification, they have conducted a minimum of 3 approaches and landings

using approved CAT II or III procedures during the previous six month period, at least one of which must be conducted in the aircraft.

(b) Recency for LVTO is maintained by retaining the CAT II or III qualification prescribed in sub-paragraph (a) above.

(c) An operator may not substitute this recency requirement for recurrent training.

3.9. Single-engine IFR and night VFR training

(1) An operator shall provide initial and recurrent training to ensure its pilots are able to safely conduct operations in single-engine aeroplanes in flight under the instrument flight rules (IFR) and at night. Such training shall be completed on each aeroplane type flown unless the Executive Director permits a reduction in training based on similarities between the aeroplane types flown.

(2) The training required by paragraph (1) shall be completed -

(a) prior to initial assignment on a single-engine aeroplane carrying passengers, cargo or both under IFR or at night; and

(b) every 12 months thereafter.

(3) Table 1 prescribes the minimum conversion and recurrent training to be accomplished on single-engine aeroplanes authorised to be operated under IFR or at night.

TABLE 1

Minimum Training Time Requirements

Type of operation	INITIAL		RECURRENT	
	Aeroplane only	Simulator only	Aeroplane only	Simulator only
Passenger carriage	4.0	4.0	1.0	N/A
Cargo-only carriage	2.0	N/A	1.0	N/A

Notes -

1. *Written exams are mandatory at completion of both Initial and recurrent ground training.*

2. *Synthetic training device and aeroplane times are pilot flying (PF) times only.*

3. *The Executive Director will determine on a case by case basis what combination of aeroplane/simulator training totalling 4 hours is to be accomplished based on the simulator's approved capabilities.*

4. *Notwithstanding the above training times, all training shall be to an acceptable standard.*

(4) Where an approved synthetic training device is available within Namibia for a specific aeroplane type, the simulator training published in Table 1 shall be accomplished in such device, including all emergency procedures that cannot be safely practised in the aeroplane. Where no such approved synthetic training device is reasonably available, the Executive Director may approve an aeroplane-only flight training programme where the pilot is of the opinion that safety will not be jeopardised.

3.10. IFR or night VFR without a second-in-command (single-pilot IFR)

An owner or operator may not conduct single-pilot flight under IFR or at night unless the PIC, within the preceding 12 months, has completed the following single-pilot training in the aeroplane, a FSTD or a combination of aeroplane and FSTD -

(a) if flight under IFR is to be undertaken, the following training under simulated or actual IMC -

(i) at least two instrument departures, one of which shall be with an engine out;

(ii) a minimum of five approaches consisting of at least one precision and one non-precision approach;

(iii) at least one missed approach during which an engine failure is introduced;

(iv) at least one engine-out approach; and

(v) at least three landings from approaches, one of which shall be with an engine out; and

(b) if night flight is to be undertaken, five take-offs and landings at night.

Notes -

1. *Only a FSTD that is representative of the aircraft to be flown, including navigation systems and cockpit layout, shall be approved for use.*

2. *Training shall include use of the autopilot with and without the introduction of abnormal and emergency conditions.*

3. *Any engine-out training done in the aircraft must be simulated.*

4. *Single engine aircraft are not subject to the engine-out training requirements.*

3.11. Dangerous goods

(1) An operator authorised to transport dangerous goods shall complete the training specified in Part 92 and publish such training in its operations manual.

(2) An operator not authorised to transport dangerous goods shall complete dangerous goods awareness training for operations personnel and other employees likely to come into contact with passengers or their baggage or personal effects -

(a) upon initial employment; and

(b) every 24 months thereafter.

3.12. Other courses of training as deemed appropriate by the Executive Director

(1) An operator authorised to conduct the following specialised operations, or any other, shall provide training in the equipment and procedures associated with such approvals -

(a) Extended diversion time operations (EDTO);

(b) all weather operations;

(c) GNSS;

(d) RNAV;

(e) land and hold short operations; and

(f) simultaneous operations on parallel or near-parallel instrument runways - ILS/precision runway monitor (PRM) and localizer type directional aid (LDA)/PRM - simultaneous offset instrument approaches (SOIA) training.

(2) Other courses that may be considered necessary to ensure safety of flight operations may include but not be limited to -

(a) MEL training;

(b) high altitude training;

(c) operations in ground icing conditions, if applicable;

(d) one-engine Inoperative ferry flight training;

(e) CFIT;

(f) low-energy awareness training; and

(g) other relevant subjects identified from time to time.

3.13. Upset prevention and recovery training (UPRT)

(1) The UPRT is applicable to crew members, with the purpose being to assist in combating Loss of Control in Flight (LOC-I).

(2) A UPRT training programme shall be structured in such a way that upon completion, the crew is able to demonstrate -

(a) knowledge of UPRT concepts and procedures; and

(b) skills necessary to properly respond to LOC-I situations.

(3) There are no formal UPRT evaluation requirements for flight testing and examination. A UPRT instructor shall accomplish evaluation of UPRT objectives during training.

(4) UPRT initial training may be provided as a stand-alone module of ground and flight training.

(5) An operator may contract with another operator, or with an ATO approved to conduct UPRT, to provide the UPRT to its flight crew.

(6) An operator shall certify in the pilot's file that the UPRT and checking has been accomplished to a satisfactory standard.

(7) UPRT shall consist of -

(a) initial training. This training shall include academic training and practical flight instruction on a suitable aircraft or simulator;

(b) recurrent training. A UPRT refresher course including UPRT academic and practical training must be completed at least once each 36 month period; and

(c) A pilot logbook endorsed, which is certified by a UPRT instructor on completion of an initial or recurrent UPRT program.

(8) An air service operator shall comply with the following UPRT programme requirements-

(a) each UPRT curriculum shall ensure the aircraft manufacturer's recommended training and testing requirements are carried out in the manner prescribed by such manufacturer; and

(b) a pilot's ability to demonstrate system and procedural concepts shall be included in the initial, recurrent and where applicable, the regaining competency testing.

(9) Prior to providing instruction on UPRT, an instructor shall -

(a) undergo specific UPRT instructor training prior to providing UPRT to crew members;

(b) be trained and qualified to conduct training in the FSTD or aircraft;

(c) understand the capabilities and limitations of the FSTD, to avoid negative transfer of training;

(d) hold a certificate and rating in the category, class and type of aircraft for which they are training; and

(e) have operational experience on type.

(10) Simulator utilised for UPRT training. The motion limitations for each specific FSTD used for UPRT shall have the potential to introduce negative transfer of training. The simulator shall be -

(a) approved by the Executive Director to provide UPRT;

(b) updated to meet the latest industry simulator standards for UPRT;

(c) be able to provide proper cues; and

(d) only be used within the capabilities of the aerodynamic model.

(11) Aircraft used to deliver UPRT training shall meet the following requirements:

(a) It shall provide a margin of safety for the manoeuvring to be performed;

(b) It shall have an all-attitude or all-envelope capability.

3.14. Security training

(1) An air service operator shall in terms of Part 111 establish and maintain an approved air carrier security programme appropriate to the size and scope of the operation which ensures crew members conduct themselves in the most appropriate manner to minimise the consequences of acts of unlawful interference. In order to ensure that crew members are appropriately trained, an air service operator shall, as a minimum, include the following security training elements in the air service operator approved training programme:

(a) determination of the seriousness of any occurrence;

(b) crew communication and coordination;

(c) appropriate self-defence responses;

(d) use of non-lethal protective devices assigned to crew members whose use is authorised by the Authority;

(e) understanding of behaviour of terrorists so as to facilitate the ability of crew members to cope with hijacker behaviour and passenger responses;

(f) flight crew compartment procedures to protect an aeroplane; and

(g) aeroplane search procedures and guidance on least-risk bomb locations where practicable

(2) An operator shall also establish and maintain a requirement in its approved 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 an aeroplane so that they contribute to the prevention of acts of sabotage or other forms of unlawful interference.

135.03.5 EMPLOYEE AND SERVICE AGENT TRAINING

1. *Any reference to "equivalent course of studies" in this TS means that credit may be given for previous training received towards a pilot licence but that additional training may be required.*

2. *For persons without any formal training, credit may be given based on relevant experience but is subject to a knowledge assessment by the NCAA or an NCAA-approved person.*

1. Qualifications of Flight Operations Officer instructors and examiners

(1) An air service operator shall not assign any person to provide and no person shall provide any generic or operator-specific flight operations officer (FOO) training required in terms of Division Four of Subpart 3, unless such person -

(a) has successfully completed a FOO generic course of studies or an acceptable equivalent course of studies and received certification from the approved training organisation having conducted the training; and

(b) has successfully completed the operator-specific FOO training and received a certificate of competency issued by the operator in terms of this technical standard.

(2) An operator shall not assign and no person shall act as a FOO examiner unless such person -

(a) is the holder of a current FOO certificate of competency appropriate to their assigned duties;

(b) has completed the FOO training referred to in sub-paragraph (a) appropriate to their assigned duties; and

(c) has been certified by the operator to act as a FOO examiner for those types of operational control systems and aeroplanes listed in the certification.

2. Qualifications of a Flight Operations Officer

(1) No person may be assigned to FOO duties, except under adequate supervision, unless such person-

(a) in the case of a new hire FOO, has -

(i) completed the generic training outlined in section 3 or an acceptable equivalent course of studies;

(ii) completed the operator-specific training required by section 4; and

(iii) been issued a certification of competence by the operator indicating the operational control system(s) and company aeroplane(s) authorised; or

(b) has undergone the operator's specific FOO training and demonstration of competence within the 12 months preceding such assignment: Provided -

(i) the FOO's training file provides evidence of the completion of the training and demonstration of competence approved by that operator; and

(ii) the FOO has been issued a certification of competence issued by the operator indicating the operational control system/s and company aeroplanes authorised.

(2) Where a FOO has previously undergone the generic training prescribed in section 3, the validity of which has not lapsed, the requirements of paragraph (1)(a)(i) above are deemed to have been met.

(3) No operator shall assign a FOO to duty when such person has not acted in that capacity -

(a) for a period of six months, unless such person has undergone a briefing on changes to procedures or other changes in the operational control system (OCS) that have occurred since the person last served;

(b) for a period of one to two years, unless such person has undergone the recurrent course of studies;

(c) for a period of greater than 2 years, unless such person has undergone the initial course of studies of the company-specific training and has successfully completed the appropriate check; and

(d) for a period of 5 years since completion of the generic operations officer training, unless such person has acted as a FOO for at least 6 months in the preceding 24 months, unless such person -

(i) has undergone refresher training based upon the generic course; and

(ii) has completed the company-specific training and has successfully completed the appropriate check.

3. Flight operations officer generic training

(1) The following subjects form the basis for generic training -

(a) air law - rules and regulations relevant to a FOO, appropriate air traffic services practices and procedures;

(b) aircraft general knowledge -

(i) principles of operation of aeroplane powerplants, systems and instruments;

(ii) operating limitations of aeroplanes and powerplants; and

(iii) minimum equipment list;

(c) flight performance calculation, planning procedures and loading -

(i) effects of loading and mass distribution on aircraft performance and flight characteristics; mass and balance calculations;

(ii) operational flight planning; fuel consumption and endurance calculations; alternate aerodrome selection procedures; en route cruise control; extended range operation;

(iii) preparation and filing of air traffic services flight plans; and

(iv) basic principles of computer-assisted planning systems;

(d) human performance - human performance relevant to dispatch duties;

(e) meteorology -

(i) aeronautical meteorology; the movement of pressure systems; the structure of fronts, and the origin and characteristics of significant weather phenomena which affect take-off, en route and landing conditions; and

(ii) interpretation and application of aeronautical meteorological reports, charts and forecasts; codes and abbreviations; use of, and procedures for obtaining, meteorological information;

(f) navigation - principles of air navigation with particular reference to instrument flight;

(g) operational procedures -

(i) use of aeronautical documentation;

(ii) operational procedures for the carriage of freight and dangerous goods;

(iii) procedures relating to aircraft accidents and incidents;

(iv) emergency in-flight procedures; and

(v) procedures relating to unlawful interference and sabotage of aircraft;

(h) principles of flight - principles of flight relating to the appropriate category of aircraft; and

(i) radio communication - procedures for communicating with aircraft and relevant ground stations.

(2) Practical Training.

The applicant shall have served under the supervision of a FOO or, in the case of an operator having only one FOO, a suitably qualified person designated by the person

responsible for flight operations or approved by the Executive Director, for at least 90 working days within the six months immediately preceding the application.

4. Operator-specific flight operations officer and flight follower training - general

(1) The operator shall establish and maintain approved ground training programmes for FOOs and flight followers in its employ whether on a full-time or part-time basis or are otherwise engaged under the provisions of contractual services approved by the Executive Director for that operator.

(2) Each training programme shall be published in the operations manual.

(3) Each training curriculum shall be appropriate to the employee's duties and in consideration of the type and complexity of the OCS approved for the operator.

(4) Each FOO or flight follower trainee shall receive operator-specific training as outlined in the applicable curriculum.

5. Flight operations officer training

The operator-specific FOO training programme shall be published as individual syllabi in terms of initial, recurrent, transition, flight familiarisation and regaining competency training based upon the following -

(a) initial training is a course of studies given to each new hire and covers the complete initial company induction syllabus and complete aeroplane type training syllabus as relating to the person's assigned duties. Initial training and the related examinations must be reviewed and revised from time to time and at any time new information becomes relevant to the OCS as the result of operational or safety management system (SMS) feedback;

(b) recurrent training shall occur every 12 months and include new material that may have been added to the initial course of studies or new information resulting from operational experience that may affect the efficiency, effectiveness or safety of the operator's OCS;

(c) transition training is training provided for any FOO to make a transition from one type of aeroplane type or variant to another except where the Executive Director allows such aeroplanes or variants to be grouped together as, an aeroplane type;

(d) flight familiarisation is training provided to each FOO for the purpose of ensuring an enhanced knowledge of the operational practices of a flight in progress and the manner of interfacing with the flight watch system; and

(e) regaining competency is training provided to a FOO when such person has not acted in the capacity for which they have been trained.

6. Flight follower training

(1) Each person assigned to act as a flight follower who is not the holder of a FOO certification shall receive training appropriate to his or her assigned duties.

(2) Where flight followers are utilised only under the direct supervision of a certified FOO, training may be accomplished in an on-the-job training programme that includes sufficient technical knowledge in the training programmes required in section 5 above. Such on-the-job-training programme and the specific duties of a flight follower who does not hold a FOO credential shall be published in the operator's operations manual.

(3) Where flight followers are not utilised under the direct supervision of a certified FOO, training may be accomplished in an on-the-job training programme under a suitably qualified flight follower.

7. Operator's company induction syllabus for initial training

(1) The content of a company induction training programme for a FOO shall include -

(a) the operations manual system covering pertinent information dealing with -

(i) manual structure including all manuals providing need to know information for dispatchers and the amendment procedures for such manual system;

(ii) company management organisation and how the OCS interfaces with management;

(iii) duties and responsibilities of those exercising operational control of flight following services;

(iv) operators approved for categories A or B operational control system, a full description of the system so approved;

(v) specific domestic and foreign rules and regulations significant to the operator by virtue of its type and area of operation giving emphasis on regulatory differences from the Namibian regulations;

(vi) dispatch release policy;

(vii) procedures for the resolution of conflict between the dispatcher and the PIC;

(viii) flight following services and provision of information to a flight;

(ix) local weather patterns and tendencies;

(x) operator's fuel policy;

(xi) dispatch interface with the operator's SMS;

(xii) dispatch interface with the operator's QA programme;

(xiii) details of the operator's security programme;

(xiv) details of the maintenance release policy;

(xv) details of the operator's emergency response plan including OCS participation in overdue or missing aeroplanes;

(xvi) handling a declaration of an emergency;

(xvii) operational weather minima;

(xviii) the approved types of operational flight plans and flight planning procedures;

(xix) crew resource management training including human factors, risk analysis and error management training;

(xx) dangerous goods training as applicable;

(xxi) details of the operator's load control procedures;

(xxii) details of the operator's communication equipment and policies including communication failure procedures;

(xxiii) details of the operator's official reporting systems;

(xxiv) surface contamination training where the operator operates into areas where surface contamination is known to exist; and

(xxv) company policy with respect to the dissemination of information relating to -

(aa) weather specials, severe or weather phenomena;

(bb) Notams; or

(cc) security measures;

(b) details of the air operator certificate and operations specifications including -

(i) Part A General provisions;

(ii) Part B En route authorisations and limitations including special authorities;

(iii) Part C Aerodrome authorisations and limitations;

(iv) Part D Maintenance;

(v) Part E Mass and balance;

(vi) Part F Interchange of equipment operations; and

(vii) Part G Aircraft leasing operations; and

(c) any other subject area the Executive Director deems to be pertinent.

(2) The content of a company induction training programme for a flight follower shall include those items from paragraph (1) related to the flight follower's duties.

8. Aeroplane type specific training - FOO

(1) An operator shall provide to each FOO a course of studies relating to each type of aeroplane over which operational control is to be exercised by such person.

(2) The aeroplane course shall be named by the aeroplane type and where a variant or aeroplane group is represented, the course title shall be so revised.

(3) Each aeroplane type specific course shall provide a systems overview appropriate to the duties of a FOO. In addition, a detailed description in the normal, abnormal, emergency and supplementary procedures, including the related limitations and how those limitations may impact the decisions and assistance rendered by the person responsible for flight following.

(4) Where the aeroplane is authorised to be operated in accordance with an MEL, those systems so authorised must be discussed with reference to the appropriate ATA number of the MEL.

(5) Each course shall be based upon the aeroplane manufacturer's AFM, AOM or SOPs, as applicable, as adopted by the operator.

(6) The aeroplane technical training syllabus must include a description of at least the following -

(a) Aircraft General -

(i) exterior features;

(ii) interior features;

(iii) weights and dimensions; and

(iv) bridge and gate requirements;

(b) Electrical System - general overview to ensure the FOO has acquired a working knowledge of what consequences may result from a variety of failures of the systems and how assistance could be rendered;

(c) Fuel System -

(i) general;

(ii) fuelling and defueling procedures;

(iii) fuelling with passengers on board and special considerations during foul weather; and

(iv) fuel consumption in terms of endurance and range;

(d) Power Plant -

(i) general overview with emphasis placed upon limitations and their impact upon flight dispatch procedures/decisions; and

(ii) each FOO must acquire a knowledge of normal, abnormal and emergency procedures sufficient to know how certain malfunctions must be handled and the appropriate level of urgency to be placed upon a flight experiencing problems with its power plants;

(e) Pneumatic System -

(i) general understanding sufficient to intervene on occasions where normal systems are not functioning normally or not available;

(ii) air sources;

(iii) distribution; and

(iv) external cart;

(f) Ice and Rain Protection -

(i) engine anti-ice;

(ii) wing and airframe anti-ice;

(iii) normal operation;

(iv) limitations; and

(v) knowledge of the capabilities of the aeroplanes in icing conditions that they oversee;

(g) Air Conditioning and Pressurisation - general overview of the consequences of failure of the system as related to altitude, range and safety/health issues;

(h) Hydraulic Power - general description and the impact of failure on aeroplane performance;

(i) Landing Gear - general description and dispatch considerations in the event of failure or malfunction;

(j) Avionics -

(i) general; and

(ii) navigation and communication equipment and company adopted procedures relating to navigation and communication; and

(k) Performance -

(i) general;

(ii) flight planning;

(iii) take-off performance;

(iv) en route performance;

(v) landing performance;

(vi) abnormal operations/non-standard configurations; and

(vii) MEL/CDL considerations.

9. Flight familiarisation training - FOO

(1) An operator shall provide to each FOO flight familiarisation training every 12 months as an observer occupying a flight deck observer seat during not less than one flight sector. The flight deck seat should provide the FOO with the ability to hear all voice communications.

(2) Flight familiarisation must commence at the dispatch centre and the observer given the opportunity to receive the briefing and to witness how this information is used for the different phases of the flight.

(3) Flight familiarisation shall be recorded and signed by the observer and the pilot-in-command.

1. Security training for ground personnel

(1) An operator shall provide security training for the purpose of heightening overall security awareness among the ground operating personnel whose function is essential to flight operations. Ground personnel considered significant to aeroplane operations would include but not be limited to -

(a) personnel designated as dangerous goods packing, shipping or loading of dangerous materials;

(b) service counter personnel;

(c) personnel designated as cargo, mail or baggage handlers;

(d) catering personnel;

(e) service personnel whose function would require coming into contact with or have access to an aircraft or its loading or service bays;

(f) maintenance personnel; or

(g) personnel who man stores handling anything that is designated for, or is likely to be placed on an aeroplane.

(2) The training required by paragraph (1) must be designed to acquaint appropriate employees with preventive measures and techniques in relation to passengers, baggage, cargo, mail, equipment, stores and supplies intended for carriage on an aeroplane so that they contribute to the prevention of acts of sabotage or other forms of unlawful interference.

135.03.6 CHECKING OF FLIGHT CREW MEMBERS

(1) Except as provided in paragraphs (3) and (5), each flight crew member shall successfully demonstrate his or her proficiency to a DFE or authorised person by undergoing a pilot proficiency check (PPC) on each type of aeroplane operated -

(a) upon completion of initial type rating flight training;

(b) every six months following initial type rating flight training; and

(c) upon completion of upgrade training.

(2) The PPC referred to in paragraph (1) shall be completed as prescribed in Schedule One or Two of this technical standard (TS) as applicable to the type of aeroplane operated and the operations conducted (IFR/VFR).

(3) In the case of flight crew members operating single-engine aeroplanes under visual flight rules-only, each pilot shall, upon completion of initial flight training and every six months thereafter, successfully demonstrate his or her competency by undergoing a competency check (CC) conducted by a pilot designated by the operator on each type of aeroplane operated, unless checking credits have been approved as provided in paragraph (5).

(4) In addition, each flight crew member of a large aeroplane shall successfully complete a line check following initial or upgrade line induction training and annually thereafter. Such line check shall be completed by a company check pilot and the results of the check recorded in the crew member's training records. A line check shall consist of an assessment of the flight crew member's ability to conduct safe operations over a representative route of the operator's route structure.

(5) An operator may be permitted checking credits for different types or variants of aeroplanes based on the demonstrated similarities between the aeroplanes, hereinafter referred to as aeroplane grouping. Notwithstanding approved aeroplane grouping, the initial PPC or competency check shall be completed on each type of aeroplane operated and the subsequent PPCs or competency checks shall be accomplished on a rotating basis between the aeroplanes involved. For the purposes of this TS and CAR 135.03.6(3)(a), a recurrent PPC or CC completed on one aeroplane type shall be deemed to have been completed on all aeroplane types for which aeroplane grouping has been approved.

(6) A record of each check completed as required by this TS shall be retained on the flight crew member's training record.

(7) Any two PPCs that are similar in nature and occur within 4 months of each other shall not alone satisfy the requirements of paragraphs (1)(b) and (3) above.

(8) Line checks – by suitably qualified company check pilots nominated by the operator and approved by the Authority.

SCHEDULE 1

PPC Criteria Using Full Flight Simulators

1. Pre-flight Phase

(1) Flight planning and equipment examinations are not mandatory when there are, in the training records, written examinations from initial or annual training for which the validity period has not expired.

(2) Flight planning shall include a practical examination on the crew's knowledge of operator's approved Standard Operating Procedures and the Aircraft Flight Manual including aeroplane and runway performance charts, and weight and balance procedures.

(3) The equipment examination shall consist of a display of practical knowledge of the airframe, engine, major components and systems including the normal, abnormal and emergency operating procedures and limitations relating thereto.

2. Flight Phase

(1) Taxiing -

(a) the use of the taxiing check list; and

(b) taxiing in compliance with clearances and instructions issued by the person conducting the PPC;

(c) where a SIC is undergoing the PPC, outlined above to the extent practicable from the SIC position.

(2) Engine Checks -

Engine checks shall be conducted as appropriate to the aeroplane type.

(3) Take-off

(a) one normal take-off to be performed in accordance with the Aircraft Flight Manual;

(b) an instrument take-off in the minimum visibility approved for the operator;

(c) a take-off in a minimum of a 10kt crosswind component;

Note - *Any or all of the above take-offs may be combined*.

(d) a take-off with failure of an engine at a speed greater than V1 and at an altitude of less than 50 feet AGL; or at a speed as close as possible to, but greater than V1 when V1 and V2, or V1 and Vr are identical, such engine to be the critical engine if the aeroplane concerned has a critical engine; and

(e) a rejected take-off from a speed not less than 90% of the calculated V1 or as appropriate to the aeroplane type.

(4) Instrument Procedures -

Instrument procedures shall consist of IFR pre-flight preparations, terminal and en route procedures, arrival and departure procedures, system malfunctions and where applicable, the proper programming and use of flight management systems, as applicable -

(a) an area departure and an area arrival procedure shall be performed where the crew -

(i) adheres to air traffic control clearances and instructions; and

(ii) properly uses the available navigation equipment and facilities;

(b) a holding procedure;

(c) at least two instrument approaches performed in accordance with procedures and limitations in the AIP or in the equivalent foreign publication, or approved company approach procedure for the facility used. One of the approaches shall be a precision approach, and one a non-precision approach; and

(d) one approach and manoeuvre to land using a scene approved for circling where the operator is authorised for approaches at the published circling minima and is required during initial qualification check and annually thereafter.

(5) Manoeuvres -

Manoeuvres for initial PPC type rating should be as published by the manufacturer in the aeroplane profiles section. For a recurrent PPC, flight profiles may be selected as deemed appropriate by the examiner but in any case the selected profiles must be demonstrated in accordance with the manufacturer's profiles. At least the following flight manoeuvres shall be demonstrated -

(a) at least one steep turn in each direction with a bank angle of 45° and a change in heading of at least 180° but not more than 360°;

(b) approaches to stalls -

Note - *For the purpose of this manoeuvre the required approach to a stall is reached when there is a perceptible buffet or other alert to an impending stall*.

(i) the following approaches to stall configurations are required for initial and upgrade PPCs -

(aa) one in the take-off configuration, except where a zero-flap take-off configuration is normally used in that model and type of aeroplane. In such case one stall should be demonstrated with the aeroplane configured for normal manoeuvring;

(bb) one in a clean configuration; and

(cc) one in a landing configuration; and

(ii) on the approach to a stall demonstrated in the manoeuvring configuration the aeroplane shall be placed into a turn with a bank angle of between 15° and 30°.

Note - *Steep turns and approach to stalls are not required if the PPC is conducted via either a LOFT scenario, a scripted PPC or on a fly-by-wire aeroplane, and -*

1. for an initial PPC on aeroplane type, steep turns and approach to stalls have been satisfactorily demonstrated during initial training; and

2. for a semi-annual or an annual PPC if -

(a) steep turns and approach to stalls are required in the applicable annual training syllabus and they have been satisfactorily demonstrated during this training; or

(b) steep turns and approach to stalls are not required in the applicable annual training syllabus.

(6) Landings and Approaches to Landings -

(a) one normal landing;

(b) one landing from an approach in Instrument Meteorological Conditions (IMC) not greater than the minimum recommended for the approach;

(c) one crosswind landing with a minimum of a 10kt crosswind component;

(d) one landing and manoeuvre to that landing with, depending on aeroplane type, an engine failure as follows -

(i) for a two-engine aeroplane, failure of one engine;

(ii) for a three-engine aeroplane, failure of the centre engine combined with the failure of one outboard engine for the PIC, and failure of one outboard engine only for other than the PIC;

(iii) for a four-engine aeroplane, failure of two engines on the same side for the PIC and failure of one outboard engine only for other than the PIC.

Note - *For three and four engine aeroplanes, the pilot-in-command is required to perform a two-engine inoperative procedure during the initial qualification check and annually thereafter*.

(e) one rejected landing and one missed approach. For the purposes of the rejected landing the landing shall be rejected at a height of approximately 50 feet when the aeroplane is approximately over the runway threshold. The rejected landing may be combined with a missed approach;

(f) Category II or Category III approaches during the initial qualification flight and annually thereafter as follows -

(i) where CAT II approaches are authorised in the air operator certificate, the following is required -

(aa) for a PIC initial qualification -

(A) one CAT II ILS approach during which a practical emergency is introduced aimed at assessing crew co- ordination in decision making and the resultant missed approach; and

(B) a second CAT II ILS approach to a landing in CAT II weather minima;

(bb) for a PIC requalification on CAT II approaches, at least one CAT II ILS approach to a landing annually; and

(ii) where both CAT II and CAT III approaches are authorised in the air operator certificate, the following is required -

(aa) for a PIC initial qualification -

(A) one CAT II ILS approach during which a practical emergency is introduced aimed at assessing crew co- ordination in decision making and the resultant missed approach; and

(B) a CAT III ILS approach conducted to a landing in CAT III weather minima; and

Note - *For a pilot-in-command requalification on CAT II and CAT III approaches, successive 6 month PPCs in an approved simulator will alternate CAT II and CAT III renewal checks.*

(g) one landing without the use of an auto-land system.

Note - *Any of the landings and approaches to landings specified in this section may be combined. A minimum of two landings are required.*

(7) Normal Procedures -

The crew shall demonstrate use of as many of the operator's approved SOPs and normal procedures as are necessary to confirm that the crew has the knowledge and ability to properly use installed equipment (autopilot and hand-flown manoeuvres as appropriate).

(8) Abnormal and Emergency Procedures -

(a) the crew shall demonstrate use of as many of the operator's approved SOPs and abnormal and emergency procedures for as many of the situations as are necessary to confirm that the crew has an adequate knowledge and ability to perform these procedures;

(b) system malfunctions shall consist of a selection adequate to determine that the crew has satisfactory knowledge and ability to safely handle malfunctions; and

(c) at least two simulated engine failures, excluding failures on the runway followed by a rejected take-off, at any time during the check.

(9) Airborne Manoeuvres -

Where the PPC is conducted following initial training in a level A or B training programme, the following flight checking is required within 30 days after the PPC in a synthetic training device and may be run concurrent with the flight training requirements on the aeroplane type in the applicable training programme -

(a) interior and exterior aeroplane pre-flight checks;

(b) ground handling for pilots-in-command;

(c) normal take-off, visual circuit (where possible) and landing;

(d) a simulated engine failure procedure after take-off (at safe altitude and airspeed);

(e) a simulated engine inoperative landing; and

(f) a normal missed approach.

SCHEDULE 2

PPC Criteria Using the Aeroplane Only

1. Pre-flight Phase

(1) Flight Planning and Equipment Examination -

(a) flight planning and equipment examinations are not mandatory when there are, in the training records, written examinations from initial or annual training for which the validity period has not expired;

(b) flight planning shall include a practical examination on the pilot's knowledge of standard operating procedures and the Aircraft Flight Manual including performance charts, loading, weight and balance and Flight Manual Supplements; and

(c) the equipment examination shall show a practical knowledge of the airframe, engine, major components and systems including the normal, abnormal and emergency operating procedures and limitations relating thereto.

(2) Aeroplane Inspection

A pre-flight aeroplane inspection that includes -

(a) a visual inspection of the exterior and interior of the aeroplane, locating each item to be inspected and explaining the purpose of the inspection;

(b) the proper use of the pre-start, start and pre-taxi check lists; and

(c) checks of the appropriate radio communications, navigation and electronic equipment and selection of the appropriate communications and navigation frequencies prior to flight.

2. Flight Phase

(1) Taxiing

(a) taxiing procedures;

(b) a taxiing check including -

(i) the use of the taxiing check list; and

(ii) taxiing in compliance with clearances and instructions issued by the appropriate air traffic control unit or by the person conducting the PPC; and

(iii) where a SIC is undergoing the PPC, the taxiing check outlined above to the extent practicable from the SIC position.

(2) Engine checks

Engine checks shall be conducted as appropriate to the aeroplane type.

(3) Take-off

(a) one normal take-off to be performed in accordance with the Aircraft Flight Manual or where the aeroplane is a turbo-jet, a noise abatement take-off performed in accordance with the Aircraft Flight Manual (where applicable) and the IAIP;

(b) an instrument take-off performed in the same manner as the normal take-off except that instrument flight rules are simulated at or before reaching an altitude of 200 feet above the airport elevation;

(c) where practicable under existing meteorological, airport or airport traffic conditions, one crosswind take-off performed in accordance with the aeroplane operating manual where applicable;

Note - *Any or all of the above take-offs may be combined*.

(d) a simulated engine failure after take-off (at a safe altitude and airspeed) appropriate to the aeroplane type under the prevailing conditions; and

(e) a rejected take-off explained by the candidate prior to the flight.

(4) Instrument procedures:

Instrument procedures shall consist of IFR pre-flight preparation, departure and enroute procedures, terminal procedures and system malfunction -

(a) an area departure and an area arrival procedure shall be performed where the pilot -

(i) adheres to actual or simulated air traffic control clearances and instructions; and

(ii) properly uses the available navigation facilities;

(b) a holding procedure;

(c) at least two instrument approaches performed in accordance with procedures and limitations in the IAIP or the equivalent foreign publication, or approved company approach procedure for the approach facility used. Where practicable one of the approaches shall be a precision approach and one a non-precision approach;

(d) a circling approach, where the operator is authorised for circling minima below ceiling 1 000 feet and 3 miles ground visibility, except where local conditions beyond the control of the pilot prevent a circling approach from being performed.

(5) In flight manoeuvres -

(a) at least one steep turn in each direction with a bank angle of 45° and a change in heading of at least 180° but not more than 360°; and

(b) approaches to stalls -

Note - *For the purpose of this manoeuvre the required approach to a stall is reached when there is a perceptible buffet or other alert to an impending stall*.

The following approaches to stall configurations are required for initial and upgrade PPCs -

(i) one in the take-off configuration, except where a zero-flap take-off configuration is normally used in that model and type of aeroplane. In such case one stall should be demonstrated with the aeroplane configured for normal manoeuvring;

(ii) one in a clean configuration; and

(iii) one in a landing configuration.

On the approach to a stall demonstrated in the manoeuvring configuration the aeroplane shall be shall be placed into a turn with a bank angle of between 15° and 30°;

For the purpose of this manoeuvre the required recovery from a stall is initiated when there is a perceptible buffet or other alert of an impending stall entry.

When performed in an aeroplane the approach to stalls shall be conducted at an altitude of at least 5 000 feet AGL and if conducted above cloud at an altitude of at least 2 000 feet above the cloud tops.

(6) Landings and approaches to landings -

(a) one normal landing which shall, where practicable, be conducted without external or internal glideslope information;

(b) one landing from an instrument approach, and where prevailing conditions prevent an actual landing, an approach to a point where a landing could have been made;

(c) one cross wind landing where practicable under existing meteorological, airport and airport traffic conditions;

(d) one landing and manoeuvring to that landing with a simulated failure of 50 percent of the available engines which shall be on one side of the aeroplane for the PIC and on outboard engine only for other than the PIC. Where the aeroplane type is a three engine aeroplane, the loss of power shall be an outboard engine and the centre engine for the PIC and on outboard engine for other than the PIC. For three- and four-engine aeroplanes the PIC is required to perform a two-engine inoperative procedure during initial qualification check and annually thereafter; and

(e) one landing under simulated circling approach conditions except that where prevailing conditions prevent a landing, an approach to a point where a landing could have been made.

Note - *Any of the landings and approaches to landings specified in this section may be combined. A minimum of two landings are required*.

(7) Normal procedures

The crew shall demonstrate use of as many of the operator's approved Standard Operating Procedures, and normal procedures as are necessary to confirm that the crew has the knowledge and ability to properly use installed equipment, (autopilot and hand flown manoeuvres as appropriate).

(8) Abnormal and emergency procedures -

(a) the crew shall demonstrate use of as many of the operator's approved Standard Operating Procedures and abnormal and emergency procedures for as many of the emergency situations as is necessary to confirm that the crew has an adequate knowledge and ability to perform these procedures;

(b) system malfunctions shall consist of a selection adequate to determine that the crew has satisfactory knowledge and ability to safely handle malfunctions;

(c) at least two simulated engine failures any time during the check shall be introduced.

135.04.2 OPERATIONS MANUAL

1. Structure of operations manual

(1) An operator's operations manual (OM) may consist of one manual or, due to the size and complexity of the operation, may consist of several manuals, in which case the operator has established an operations manual system. For the purposes of this technical standard (TS), the term "operations manual" includes an "operations manual system" if that is what the operator has established.

(2) An operator must ensure that the main structure of the operations manual is as follows

Part A: General

This part must comprise all non-type-related operational policies, instructions and procedures needed for a safe operation and must comply with all relevant CAR.

Part B: Aeroplane operating matters

This part must comprise all type-related instructions and procedures needed for a safe operation. It must take account of the different types of aeroplanes or variants used by the operator.

Part C: Route and aerodrome instructions and information

This part must comprise all instructions and information needed for the area of operation.

Part D: Training

This part must comprise all training instructions for personnel required for a safe operation.

(3) An operator must ensure that the contents of the operations manual are in accordance with section 2 of this TS and relevant to the area and type of operation and that each manual in the system of manuals, if applicable, contains at least the following introductory layout -

(a) title page;

(b) table of contents;

(c) record of amendments page; and

(d) list of effective pages.

(4) An operator must ensure that the detailed structure of the operations manual is approved by the Executive Director.

2. Contents of operations manual

2.1. PART A: GENERAL

2.1.1. Administration and control of operations manual

(1) An operations manual shall contain certain statements and provisions for the

(a) a statement that the manual is intended to comply with -

(i) all applicable acts, regulations and associated technical standards;

(ii) the terms and conditions of the applicable operating certificate; and

(iii) the authorisations, conditions and limitations of the operations specifications associated with the AOC;

(b) a statement that, where any person is confronted with an operational situation not contemplated by the operations manual, such person

will be expected to act in accordance with his or her most conservative discretion. Furthermore, where any part of the manual is considered to be repugnant to any provision referred to in sub-paragraph (a), such person shall comply with the respective legal statute and report the discrepancy to the responsible person by the quickest means possible;

(c) a statement that the manual contains operational instructions that are to be complied with by the relevant personnel;

(d) a list and brief description of the various parts, their contents, applicability and use (table of contents);

(e) explanations and definitions of terms and words needed for the use of the manual;

(f) where a manual system is in use by the operator, provisions for the issuance of each component in separate parts corresponding to specific aspects of the operation; and

(g) a brief description, by whatever means, of the operator's manual system that lists all operational and technical manuals developed or adopted by the operator for the purpose of ensuring operations personnel have been provided all information necessary for the performance of their duties. The means by which the description is provided shall indicate which manuals, or parts thereof, of the manual system will be available on board an aeroplane during flight time.

(2) System of amendment and revision -

(a) who is responsible for the issuance and insertion of amendments and revisions;

(b) a record of amendments and revisions with insertion dates and effective dates;

(c) in the interests of aviation safety, a statement that provides for the rapid dissemination of operational information with a system of priorities governing the implementation process. Handwritten amendments and revisions are not permitted except in situations requiring immediate amendment or revision in the interests of aviation safety;

(d) a description of the system for the annotation of pages and their effective dates;

(e) a list of effective pages;

(f) annotation of changes (on text pages and, as far as practicable, on charts and diagrams);

(g) temporary revisions; and

(h) a description of the distribution system for the manuals, amendments and revisions.

2.1.2. Organisation and responsibilities

(1) Organisational structure

(a) For the purposes of this technical standard, the term "functional area" refers to a specific aspect of the operator's business, such as flight operations or maintenance, for which a person would normally be assigned the responsibility for its operation. In larger companies a functional area would be termed "division" or "department".

(b) A description of the organisational structure through the use of one or more organograms. The organogram(s) must depict the relationship between all functional areas related to the safety of operations (e.g. flight operations, maintenance, training, quality, safety and security), including their relationship to the chief executive officer. In particular, the subordination and reporting lines between the various post-holders shall be shown.

(2) Post-holders

The name, functions and responsibilities of each post-holder shall be listed.

(3) Responsibilities and duties of designated personnel

A description of the specific responsibilities and duties delegated by a post-holder to certain personnel within a functional area.

(4) Authority, duties and responsibilities of the pilot-in-command (PIC) A statement defining the authority, duties and responsibilities of the PIC.

(5) Duties and responsibilities of crew members other than the PIC

A statement defining the duties and responsibilities of crew members other than the PIC.

2.1.3. Operational control and supervision

(1) Supervision of the operation by the operator

A description of the system for supervision of the operation by the operator. This must show how the safety of flight operations and the

qualifications of personnel are supervised. In particular, the procedures related to the following items must be described-

(a) licence and qualification validity;

(b) competence of operations personnel; and

(c) control, analysis and storage of records, flight documents, additional information and data.

(2) System of promulgation of additional operational instructions and information

A description of any system for promulgating information which may be of an operational nature but is supplementary to that in the operations manual. The applicability of this information and the responsibilities for its promulgation must be included.

(3) Operational control

A description of the procedures and responsibilities necessary to exercise operational control with respect to flight safety.

2.1.4. Safety management system (SMS)

A description of the organisation of, roles and responsibilities of the personnel employed in, and policies and procedures associated with the safety management system. The description of the SMS may be contained in a separate manual depending upon the size and complexity of the operator.

2.1.5. Quality management system (QMS)

A description of the organisation of, roles and responsibilities of the personnel employed in, and policies and procedures associated with the QMS, which is normally integrated with the SMS. The description of the QMS may be contained in the SMS manual or a quality management manual (QMM) depending upon the size and complexity of the operator.

2.1.6. Flight crew composition

(1) Flight crew composition

An explanation of the method for determining flight crew compositions taking account of the following -

(a) the type of aeroplane being used;

(b) the area and type of operation being undertaken;

(c) the phase of the flight;

(d) the minimum flight crew requirement;

(e) minimum flight time experience requirements, recency and qualification of the flight crew members; and

(f) the designation of the PIC and, if necessitated by the duration of the flight, the procedures for the relief of the PIC or other members of the flight crew.

(2) Designation of the PIC

The method for designating one PIC for each flight.

(3) Flight crew incapacitation

Instructions on the succession of command in the event of flight crew incapacitation.

2.1.7. Qualification requirements

(1) A description of the required licence, rating(s), qualification/competency (e.g. for routes and aerodromes), experience, training, checking and recency for operations personnel to conduct their duties. Consideration must be given to the aeroplane type, kind of operation and composition of the flight crew.

(2) Flight deck crew

(a) Pilot-in-command;

(b) Second-in-command, if applicable;

(c) Pilot under supervision;

(d) Cruise relief pilot, if applicable; and

(e) Operation on more than one type or variant.

(3) Training, checking and supervision personnel

(a) For flight deck crew;

(b) Other operations personnel.

2.1.8. Flight crew health precautions

Guidance to flight crew members concerning health including -

(a) alcohol and other intoxicating liquor;

(b) narcotics;

(c) drugs;

(d) sleeping tablets;

(e) pharmaceutical preparations;

(f) immunisation;

(g) meal precautions prior to and during flight;

(h) sleep and rest; and

(i) surgical operations.

2.1.9. Flight time and duty period limitations

(1) Flight time and duty period limitations and rest requirements

A description of the operator's approved flight time and duty period programme.

(2) Provisions for exceeding flight time and duty period limitations and/or reductions of rest periods

Conditions under which flight time and duty periods may be exceeded or rest periods may be reduced and the procedures used to report these modifications.

2.1.10. Operating procedures

(1) Flight preparation instructions

As applicable to the operation -

(a) a description of the method of determination and application of minimum altitudes including -

(i) a procedure to establish the minimum altitudes/flight levels for VFR flights; and

(ii) a procedure to establish the minimum altitudes/flight levels for IFR flights;

(b) criteria for determining the usability of aerodromes;

(c) the method for establishing aerodrome operating minima for IFR flights in accordance with TS 91.07.5 of document NAM-CATS 91. Reference must be made to procedures for the determination of the visibility and/or runway visual range and for the applicability of the actual visibility.

(d) enroute operating minima for IFR and VFR flights or VFR portions of a flight;

(e) presentation and application of aerodrome and en route operating minima, including the increase of aerodrome operating minima in case of degradation of approach or aerodrome facilities;

(f) interpretation of meteorological information, including explanatory material on the decoding of MET forecasts and MET reports relevant to the area of operations, including the interpretation of conditional expressions;

(g) the methods by which the quantities of fuel, oil and water methanol to be carried, are determined and monitored in flight. This section must also include instructions on the measurement and distribution of the fluid carried on board. Such instructions must take account of all circumstances likely to be encountered on the flight, including the possibility of in-flight replanning and of failure of one or more of the aeroplane's power plants or loss of pressurisation. The system for maintaining fuel and oil records must also be described;

(h) the general principles of mass and centre of gravity including -

(i) definitions;

(ii) methods, procedures and responsibilities for preparation and acceptance of mass and centre of gravity calculations;

(iii) the policy for using either standard and/or actual masses;

(iv) the method for determining the applicable passenger, baggage and cargo mass;

(v) the applicable passenger and baggage masses for various types of operations and aeroplane type;

(vi) general instruction and information necessary for verification of the various types of mass and balance documentation in use;

(vii) last minute changes procedures;

(viii) specific gravity of fuel, oil and water methanol; and

(ix) seating policy/procedures;

(i) procedures and responsibilities for the preparation and submission of the air traffic service flight plan. Factors to be considered include the means of submission for both individual and repetitive flight plans;

(j) procedures and responsibilities for the preparation and acceptance of the operational flight plan. The content and use of the operational flight plan must be described;

(k) the responsibilities and the use of the operator's flight folio must be described. A technical log may be used in place of a flight folio, if it contains the required information; and

(l) list of documents, forms and additional information to be carried.

(2) Ground handling instructions

As applicable to the operation -

(a) a description of fuelling procedures, including -

(i) safety precautions during refuelling and defueling including when an APU is in operation or when a turbine engine is running and the prop-brakes are on;

(ii) refuelling and defueling when passengers are embarking, on board or disembarking; and

(iii) precautions to be taken to avoid mixing fuels;

(b) a description of the handling procedures to be used when allocating seats and embarking and disembarking passengers and when loading and unloading the aeroplane. Further procedures, aimed at achieving safety whilst the aeroplane is on the apron, must also be given. Handling procedures must include -

(i) disembarking of persons;

(ii) sick passengers and persons with reduced mobility;

(iii) transportation of inadmissible passengers, deportees or persons in custody;

(iv) permissible size and weight of hand baggage;

(v) loading and securing of items in the aeroplane;

(vi) special loads and classification of load compartments;

(vii) positioning of ground equipment;

(viii) operation of aeroplane doors;

(ix) safety on the apron, including fire prevention, blast and suction areas;

(x) start-up, apron departure and arrival procedures;

(xi) servicing of aeroplanes;

(xii) documents and forms for aeroplane handling; and

(xiii) multiple occupancy of aeroplane seats;

(xiv) management of all ground handling functions, including but not limited to the following:

(aa) passenger services;

(bb) baggage services;

(cc) cabin services;

(dd) weight and balance control;

(ee) ground support equipment;

(ff) fuel services;

(gg) ramp operation; and

(hh) training programmes.

(c) procedures to ensure that persons who appear to be intoxicated or who demonstrate by manner or physical indications that they are under the influence of drugs, except medical patients under proper care, are refused embarkation;

(d) a description of the de-icing and anti-icing policy and procedures for aeroplanes on the ground. These must include descriptions of the types and effects of icing and other contaminants on aeroplanes whilst stationary during ground movements and during take-off. In addition, a description of the fluid types used must be given including -

(i) proprietary or commercial names;

(ii) characteristics;

(iii) effects on aeroplane performance;

(iv) hold-over times; and

(v) precautions during usage.

(3) Flight procedures

As applicable to the operation -

(a) a description of the policy for allowing flights to be made under VFR, or of requiring flights to be made under IFR, or of changing from one to the other;

(b) a description of all navigation procedures relevant to the type(s) and area(s) of operation and equipment required to operate therein. Consideration shall be given to -

(i) standard navigation procedures including policy for carrying out independent cross-checks of navigation data entries;

(ii) RVSM as contemplated in TS 91.04.31 in Document NAM-CATS 91;

(iii) RNP, MNPS and POLAR navigation and navigation in other designated areas,

(iv) RNAV;

(v) in-flight replanning; and

(vi) procedures in the event of system degradation;

(c) circumstances in which a radio listening watch is maintained;

(d) instructions on -

(i) the use of normal checklists and the timing of such use;

(ii) departure contingency procedures;

(iii) altimeter setting procedures;

(iv) altitude alerting system procedures;

(v) stabilised approach procedure and the limitation on high rates of descent near the surface;

(vi) the conduct of instrument approaches and the conditions required to commence or to continue an instrument approach;

(vii) CRM procedures at night or in IMC;

(e) TAWS procedures;

(f) policy and procedures for the use of ACAS;

(g) policy and procedures for in-flight fuel management;

(h) policy and procedures for operating in, or recording and reporting of special, routine and non-routine meteorological observations during any phase of flight and potentially hazardous atmospheric conditions including -

(i) thunderstorms;

(ii) icing conditions;

(iii) turbulence;

(iv) windshear;

(v) jetstreams;

(vi) volcanic ash clouds;

(vii) heavy precipitation;

(viii) sand storms;

(ix) mountain waves;

(x) significant temperature inversions; and

(xi) report the runway braking action via an (AIREP) when the runway braking action encountered is not as good as reported.

(i) wake turbulence separation criteria, taking into account aeroplane types, wind conditions and runway location;

(j) procedures in the event that a decision to descend is taken while en route, covering-

(i) the necessity of giving the appropriate ATS unit prior warning of the situation and of obtaining a provisional descent clearance; and

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

(k) the requirements for flight crew members to occupy their assigned stations or seats during the different phases of flight or whenever deemed necessary in the interests of aviation safety;

(l) the requirements for flight crew members and passengers to use safety belts and/or harnesses during the different phases of flight or whenever deemed necessary in the interests of aviation safety;

(m) the conditions for the admission to the flight deck of persons other than the flight crew;

(n) the conditions and procedures for the use of vacant flight crew seats;

(o) procedures to be followed in the event of incapacitation of flight crew members in flight. Examples of the types of incapacitation and the means for recognising them, must be included;

(p) procedures covering -

(i) cabin preparation for flight, in-flight requirements and preparation for landing including procedures for securing cabin and galleys;

(ii) procedures to ensure that passengers are seated where, in the event that an emergency evacuation is required, they may best assist and not hinder evacuation from the aeroplane;

(iii) procedures to be followed during passenger embarkation and disembarkation;

(iv) procedures in the event of fuelling with passengers on board or embarking and disembarking; and

(v) smoking on board;

(q) the contents, means and timing of passenger briefing in accordance with CAR 91.07.20;

(r) lists of the survival and emergency equipment required for each route or area of operation and the procedures to ensure such equipment has been inspected and/or is functioning properly prior to departure;

(s) information and instructions relating to the interception of civil aircraft including -

(i) procedures for pilots-in-command of an intercepted Namibian and foreign registered aircraft; and

(ii) visual signals for use by an intercepted Namibian and foreign registered aircraft

(t) if applicable to the aeroplane being operated, procedures for the use of required cosmic or solar radiation detection equipment and for recording its readings including actions to be taken in the event that limit values specified in the operations manual are exceeded.

(4) All weather operations

(5) EDTO procedures, including engine failure procedures and the nomination of alternate aerodromes

(6) Use of the minimum equipment and configuration deviation list(s)

(7) Development and use of standard operating procedures (SOPs) whether stand alone or as part of an aeroplane operating manual (AOM)

(8) With respect to non-revenue flights, procedures and limitations for -

(a) training flights;

(b) test flights;

(c) delivery flights;

(d) ferry flights;

(e) demonstration flights; and

(f) positioning flights,

including the kind of persons who may be carried on such flights.

(9) Oxygen requirements

(a) An explanation of the conditions under which oxygen must be provided and used.

(b) The oxygen requirements specified for -

(i) flight deck crew; and

(ii) passengers.

2.1.11. Dangerous goods and weapons

(1) If applicable, information, instructions and general guidance on the conveyance of dangerous goods including -

(a) operator's policy on the conveyance of dangerous goods;

(b) guidance on the requirements for acceptance, labelling, handling, stowage and segregation of dangerous goods;

(c) procedures for responding to emergency situations involving dangerous goods;

(d) duties of all personnel involved in the conveyance of dangerous goods as referred to in a Part 92; and

(e) instructions on the carriage of the operator's employees.

(2) The conditions under which weapons, munitions of war and sporting weapons may be carried.

(3) For operators not authorised to convey dangerous goods, policies and procedures to create an awareness of dangerous goods.

2.1.12. Security

(1) Security instructions and guidance of a non-confidential nature which must include the authority and responsibilities of operations personnel. Policies and procedures for handling and reporting crime on board such as unlawful interference, sabotage, bomb threats and hijacking must also be included.

(2) An operator shall publish an on-board means of establishing and communicating discrete signals between crew members as a defence against air piracy without providing specific information with respect to the actual discrete communications.

(3) A description of preventative security measures and training.

Note - *Parts of the security instructions and guidance may be kept confidential.*

2.1.13. Handling of aviation accidents and incidents

Procedures for the handling, notifying and reporting of aviation accidents and incidents. This section must include -

(a) definitions of aviation accidents and incidents and the relevant responsibilities of all persons involved;

(b) the description of which operator departments, authorities, or other institutions have to be notified by which means and in which sequence in case of an aviation accident;

(c) special notification requirements in the event of an aviation accident or incident when dangerous goods are being carried;

(d) a description of the requirements to report specific aviation accidents and incidents;

(e) the forms used for reporting and the procedure for submitting them to the relevant authority ;

(f) if the operator develops additional safety related reporting procedures for its own internal use, a description of the applicability and related forms to be used; and

(g) The operator to establish procedures for the retention of flight recorder records and flight recorders in safe custody pending their disposition to the accident or incident investigating team.

2.1.14. Rules of the air

Rules of the air including -

(a) visual and instrument flight rules;

(b) territorial application of the rules of the air;

(c) communication procedures including COM-failure procedures;

(d) information and instructions relating to the interception of civil aeroplanes;

(e) the circumstances in which a radio listening watch is to be maintained;

(f) signals;

(g) time system used in operation;

(h) ATC clearances, adherence to flight plan and position reports;

(i) visual signals used to warn an unauthorised aeroplane flying in or about to enter a restricted, prohibited or danger area;

(j) procedures for pilots observing an aviation accident or receiving a distress transmission;

(k) the ground/air visual codes for use by survivors, description and use of signal aids; and

(l) distress and urgency signals.

2.1.15 LEASING/CODE-SHARE

A description of the operational arrangements for leasing and code-share, associated procedures and management responsibilities.

2.2. PART B: AEROPLANE OPERATING MATTERS - TYPE RELATED

Taking account of the differences between types and variants of types under the following headings -

2.2.1. General information and units of measurement

General information (e.g. aeroplane dimensions), including a description of the units of measurement used for the operation of the aeroplane type concerned and conversion tables.

2.2.2. Limitations

A description of the certified limitations and the applicable operational limitations including -

(a) certification status;

(b) passenger seating configuration for each aeroplane type including a pictorial presentation;

(c) types of operation that are approved (e.g. IFR/VFR, CAT II/III, flights in known icing conditions, etc.);

(d) flight crew composition;

(e) mass and centre of gravity;

(f) speed limitations;

(g) flight envelope(s);

(h) wind limits including operations on contaminated runways;

(i) performance limitations for applicable configurations;

(j) runway slope;

(k) limitations on wet or contaminated runways;

(l) airframe contamination; and

(m) system limitations.

2.2.3. Normal procedures

The normal procedures and duties assigned to the flight crew and the appropriate check-lists and the system for use of the checklists. The following normal procedures and duties must be included -

(a) pre-flight;

(b) pre-departure;

(c) altimeter setting and checking;

(d) taxi, take-off and climb;

(e) noise abatement;

(f) cruise and descent;

(g) approach, landing preparation and briefing;

(h) VFR/VMC approach;

(i) instrument approach;

(j) visual approach and circling;

(k) missed approach;

(l) normal landing;

(m) post landing; and

(n) operation on wet and contaminated runways.

2.2.4. Abnormal, emergency and supplementary procedures

The abnormal, emergency and supplementary procedures and duties assigned to crew members, the appropriate checklists and the system for use of the check-lists. The following abnormal and emergency procedures and duties shall, if applicable, be included -

(a) flight crew incapacitation;

(b) fire and smoke drills;

(c) unpressurised and partially pressurised flight;

(d) exceeding structural limits such as overweight landing;

(e) exceeding cosmic radiation limits;

(f) lightning strikes;

(g) distress communications and alerting ATC to emergencies;

(h) engine failure;

(i) system failures;

(j) guidance for diversion in case of serious technical failure;

(k) ground proximity warning;

(l) ACAS warning;

(m) windshear;

(n) emergency landing/ditching; and

(o) emergency evacuation.

2.2.5. Performance

(1) Performance data must be provided in a form in which it can be used without difficulty.

(2) Performance material which provides the necessary data for compliance with the performance requirements prescribed in Subpart 8 of this Part must be included to allow the determination of -

(a) maximum crosswind and tailwind components and the reductions to be applied to these values having regard to gusts, low visibility, runway surface conditions, crew experience, abnormal or emergency circumstances or any other relevant operational factors;

(b) take-off climb limits - mass, altitude, temperature;

(c) take-off field length (dry, wet, contaminated);

(d) net flight path data for obstacle clearance calculation or, where applicable, take-off flight path;

(e) the gradient losses for banked climb-outs;

(f) enroute climb limits;

(g) approach climb limits;

(h) landing climb limits;

(i) landing field length (dry, wet, contaminated) including the effects of an in-flight failure of a system or device, if it affects the landing distance;

(j) brake energy limits;

(k) speeds applicable for the various flight stages (also considering wet or contaminated runways); and

(l) aeroplane climb performance with all engines operating to enable the PIC to determine the climb gradient that can be achieved during the departure phase for the existing take-off conditions and intended take-off technique.

(3) Supplementary data covering flights in icing conditions, in consideration of -

(a) any certificated performance related to an allowable configuration, or configuration deviation, such as anti-skid inoperative, must be included; and

(b) if performance data, as required for the appropriate performance class, is not available in the approved AFM, then other data acceptable to the Executive Director must be included. Alternatively, the operations manual may contain cross-reference to the approved data contained in the AFM where such data is not likely to be used often or in an emergency.

(4) Additional performance data, where applicable, including -

(a) all engine climb gradients;

(b) drift-down data;

(c) effect of de-icing/anti-icing fluids;

(d) flight with landing gear down;

(e) for aeroplanes with 3 or more engines, one engine inoperative ferry flights; and

(f) flights conducted under the provisions of the CDL.

2.2.6. Flight planning

(1) Data and instructions necessary for pre-flight and in-flight planning, including factors such as speed schedules and power settings. Where applicable, procedures for engine(s)-out operations, ETOPS and flights to isolated aerodromes must be included.

(2) The method for calculating fuel needed for the various stages of flight in accordance with TS 135.07.22.

2.2.7. Mass and balance

Instructions and data for the calculation of the mass and balance including -

(a) calculation system (e.g. index system);

(b) information and instructions for completion of mass and balance documentation, including manual and computer generated types;

(c) limiting masses and centre of gravity of the various versions; and

(d) dry operating mass and corresponding centre of gravity or index.

2.2.8. Loading

Procedures and provisions for loading and securing the load in the aeroplane.

2.2.9. Configuration deviation list (CDL)

The company approved procedures for the use of a CDL, if provided by the manufacturer, taking account of the aeroplane types and variants operated including procedures to be followed when an aeroplane is being dispatched under the terms of its CDL.

2.2.10. Minimum equipment list (MEL)

The company procedures for the use of an approved MEL taking account of the aeroplane types and variants operated and the type(s)/area(s) of operation.

2.2.11. Survival and emergency equipment including oxygen

(1) A list of the survival equipment to be carried for the routes to be flown and the procedures for checking the serviceability of this equipment prior to take-off. Instructions regarding the location, accessibility and use of survival and emergency equipment and its associated check lists(s) must also be included.

(2) The procedure for determining the amount of oxygen required and the quantity that is available. The flight profile, number of occupants and possible cabin decompression must be considered. The information provided must be in a form in which it can be used without difficulty.

2.2.12. Emergency evacuation procedures

(1) Instructions for preparation for emergency evacuation including flight crew coordination and emergency station assignment.

(2) A description of the duties of all members of the flight crew for the rapid evacuation of an aeroplane and the handling of the passengers in the event of a forced landing, rejected take-off, ditching or other emergency.

2.2.13. Aeroplane systems

A description of the aeroplane systems, related controls and indications and operating instructions.

2.3. PART C: ROUTE AND AERODROME INSTRUCTIONS AND INFORMATION

Instructions and information relating to communications, navigation and aerodromes including minimum flight levels and altitudes for each route to be flown and operating minima for each aerodrome planned to be used, including -

(a) minimum flight level/altitude;

(b) operating minima for departure, destination and alternate aerodromes;

(c) communication facilities and navigation aids;

(d) runway data and aerodrome facilities;

(e) approach, missed approach and departure procedures including noise abatement procedures;

(f) COM-failure procedures;

(g) search and rescue facilities in the area over which the aeroplane is to be flown;

(h) a description of the aeronautical charts that must be carried on board in relation to the type of flight and the route to be flown, including the method to check their validity;

(i) availability of aeronautical information and MET services;

(j) enroute COM/NAV procedures including holding; and

(k) Instructions on the clarification and acceptance of ATC clearances, particularly where terrain clearance is involved.

2.4. PART D: TRAINING

(1) Training syllabi and checking programmes for all flight crew members and operations personnel other than flight crew members who are assigned to duties in connection with the preparation and/or conduct of a flight.

(2) Training syllabi and checking programmes shall include -

(a) for flight crew members, all relevant items prescribed in Part 61 and Subpart 3 of this Part; and

(b) for operations personnel other than flight crew members, all relevant items pertaining to their duties as specified in Subpart 3 of this Part.

(3) Procedures -

(a) for training and checking;

(b) to be applied in the event that personnel do not achieve or maintain the required standards; and

(c) to ensure that abnormal or emergency situations requiring the application of part or all of abnormal or emergency procedures and simulation of IMC by artificial means, are not simulated during commercial flights.

(4) Description of documentation to be stored and storage periods.

135.04.3 STANDARD OPERATING PROCEDURES

1. Standard operating procedures contents

(1) SOPs shall contain the detailed procedures to be followed by flight crew members in the conduct of aeroplane normal, abnormal or emergency operations with particular emphasis on the interaction between crew members (crew resource management). SOPs shall not be contrary to any information or procedure included in the aeroplane flight manual (AFM). Required information, if contained in another publication carried on board the aeroplane during flight, need not be repeated in the SOP. The SOP shall include, as a minimum, the following as applicable to the operation -

(a) normal procedures, including -

(i) communications procedures;

(ii) crew co-ordination;

(iii) use of check lists;

(iv) standard briefings;

(v) standard calls;

(vi) ramp/gate procedures;

(vii) battery/APU engine starts;

(viii) taxi;

(ix) rejected take-off;

(x) take-off and climb;

(xi) cruise;

(xii) descent;

(xiii) instrument procedures, including holdings, approaches in IMC, visual, VFR and circling;

(xiv) landing;

(xv) missed approaches and balked landings procedures;

(xvi) stall recovery;

(xvii) fuelling with passengers on-board, if not provided elsewhere in the company operations manual system;

(xviii) use of on-board navigation and alerting aids; and

(xix) mass and balance control procedures;

(b) abnormal and emergency procedures, as applicable to the aeroplane type, including -

(i) planned and unplanned;

(ii) pilot incapacitation;

(iii) two-challenge rule;

(iv) bomb threat and hijacking;

(v) engine fire/failure/shutdown;

(vi) systems failures;

(vii) propeller over speed;

(viii) fire, internal/external;

(ix) smoke removal;

(x) rapid decompression;

(xi) flapless approach and landing;

(xii) any inadvertent encounter with moderate to severe in-flight icing;

(c) diagrams or other form of describing -

(i) normal take-off;

(ii) engine out take-off;

(iii) precision approach, all engines operating;

(iv) precision approach, engine out;

(v) non-precision approach, all engines operating;

(vi) non-precision approach, engine out;

(vii) go-around, all engines operating;

(viii) go-around, engine out;

(ix) VFR circuits;

(x) partial flaps/slats approach; and

(xi) flapless approach.

(2) The operator shall submit its SOPs and any amendments thereto to the Executive Director for technical evaluation.

2. Aeroplane operating manual

(1) An operator wishing to use an aeroplane operating manual (AOM) shall design it with human factors principles in mind. Where there are significant differences in equipment and procedures between aeroplanes of the same type operated, the AOM shall show the registration mark of the aeroplane to which it is applicable. At least the following information for each type of aeroplane operated shall be included -

(a) table of contents;

(b) list of effective pages;

(c) amending procedure;

(d) preamble;

(e) the checklists and SOPs to be used by the flight crew members;

(f) such details of the aeroplane's systems from the aircraft flight manual (AFM) as may be required for the purposes of the AOM; and

(g) the aeroplane performance data and limitations specified in the AFM. Such information shall be clearly identified as AFM data.

(2) The operator shall submit its AOM and any amendments thereto to the Executive Director for technical evaluation.

(3) An operator using an AOM need not carry an AFM if sufficient information from the AFM to safely operate the aeroplane is contained in the AOM or is otherwise available to the flight crew during flight time.

135.04.5 OPERATIONAL FLIGHT PLAN

1. Types of operational flight plans

(1) Although each flight must be released in accordance with the provisions of an OFP/flight release, the actual OFP should be appropriate to the type of flight being undertaken. An operator must publish in its operations manual a description, whether computer or manually generated, of the different OFPs used by the operator and include instructions as to the preparation, acceptance, flight and ground management of the OFP and the procedures for retention.

(2) The contents of an OFP are based on the different types of flights undertaken by operators under this Part, each of which have varying needs with respect to flight planning for revenue flight operations. Accordingly -

(a) a full OFP as specified in section 2(1) of this TS is required for -

(i) all international flight operations; and

(ii) IFR operations;

(b) an OFP consisting of at least those items indicated by a single asterisk in section 2(1) of this TS is required for day or night VFR operations using -

(i) multi-engine aeroplanes; and

(ii) single-engine aeroplanes with a maximum certificated passenger seating in excess of 9;

(c) an OFP consisting of at least those items listed in section 2(2) may, in lieu of the OFP prescribed in paragraph 1(2)(a) or (2)(b), as applicable, be used by an operator conducting a series of flights, that meet the following criteria -

(i) the series of flights shall not result in flight time longer than 90 minutes in total;

(ii) no individual sector shall be longer than 30 minutes; and

(iii) the time spent on the ground at each enroute stop shall not exceed 30 minutes; and

(d) an informal OFP, being either an ATC flight plan or equivalent record left with the operator for flight following, is required for day or night VFR operations using single-engine aeroplanes with a maximum certificated passenger seating of 9 or less.

2. Operational flight plans

(1) The minimum required content of an OFP is as follows but each field shall be considered as applicable to the type of flight, the type of aeroplane and the type of operational control system (OCS) to which the OFP applies -

Note - *Asterisks by an item indicate information required for the OFP specified in section 1(2)(c) of this TS.*

(a) *operator's name;

(b) *date and ETD at points of departure and ETA at destinations;

(c) *aeroplane registration or aeroplane tail number, as applicable;

(d) aeroplane type and model or variant, as applicable;

(e) flight* number, as applicable;

(f) *flight crew members' names and, unless recorded elsewhere, assigned position;

(g) *flight operations officer's name if flight is not pilot self-dispatch;

(h) *number of passengers on board, as amended by final load figures, unless recorded elsewhere;

(i) *departure aerodrome;

(j) *destination aerodrome;

(k) alternate aerodrome, as applicable, including enroute alternates where required;

(l) routing to destination by successive navigational way points, including associated tracks and distances for each;

(m) routing to alternate aerodrome, including associated tracks and distances, if applicable;

(n) specification of any way points en route to satisfy special operations requirements (ETOPS, etc.);

(o) planned cruise altitudes to destination and alternate, as applicable, and minimum safe altitudes along planned routes;

(p) planned cruise indicated air speed or Mach number, as applicable, true air speed and ground speed or wind component during cruise;

(q) winds at planned cruise altitude (expressed in terms of direction/velocity or as a component/drift angle);

(r) *estimated time enroute (if broken down into way point time components, a total shall be specified);

(s) time from destination to alternate, as applicable;

(t) distance to destination (if broken down into way point distance components, a total shall be specified);

(u) distance from destination to alternate, as applicable;

(v) fuel burn enroute and from destination to alternate;

(w) record of in-flight fuel checks completed in accordance with regulation 135.08.25(4);

Note: Due to the potential inaccuracy of certain aircraft fuel gauges, all fuel quantities recorded are estimates and should be verified against other available data (e.g., fuel flow meters, estimated burn rates, and physical checks where possible). Discrepancies should be noted, and appropriate measures should be taken to ensure safe fuel management throughout the flight.

(x) *fuel computation breakdown required for the type of flight plan for, as applicable, -

(i) taxi;

(ii) *destination;

(iii) alternate;

(iv) holding reserve;

(v) enroute reserve, as applicable;

(vi) *contingency fuel, as applicable; and

(vii) *the fuel on board when starting engines (entered by flight crew), unless recorded elsewhere; and

(y) *mass and balance showing -

(i) *total planned fuel on board;

(ii) zero fuel weight; and

(iii) *planned maximum take-off weight and C of G location or trim position, as applicable.

(2) The minimum required content of an OFP used for a series of flights as prescribed in section 1(2)(c) is as follows -

(a) operator's name;

(b) date;

(c) aeroplane registration or aeroplane tail number, as applicable;

(d) aeroplane type and model or variant, as applicable;

(e) flight crew members' names and, unless recorded elsewhere, assigned position;

(f) number of passengers on board for each sector, unless recorded elsewhere;

(g) departure aerodrome;

(h) enroute stops;

(i) final destination aerodrome;

(j) alternate aerodrome (only one needs be specified for the entire series of flights);

(k) total estimated time enroute;

(l) time from final destination to alternate;

(m) sector safe altitude for each IFR sector, if applicable;

(n) total fuel required for the entire series of flights based on fuel required -

(i) for all taxiing;

(ii) to reach each enroute stop and final destination;

(iii) to the alternate, if applicable;

(iv) for holding reserve, if applicable;

(v) for enroute reserve, as applicable; and

(vi) for contingency fuel, as applicable; and

(o) the fuel on board when starting engines (entered by flight crew), unless recorded elsewhere.

(3) The format of a full OFP shall allow the crew to record the fuel state and the progress of the flight relative to the plan. The OFP may be computer-generated or produced manually, working from charts and tables, by the flight crew. When an OFP is prepared manually, an approved form displaying the requisite information and providing the necessary space to make flight following entries as the flight progresses shall be used.

(4) The operator shall specify in its company operations manual how formal acceptance of the OFP by the PIC shall be recorded. Such acceptance procedure shall signify that the PIC is satisfied the OFP is suitable for use and meets regulatory requirements.

135.04.7 **RECORDS OF EMERGENCY AND SURVIVAL EQUIPMENT**

1. Emergency and survival equipment list

The minimum information to be contained in an emergency and survival equipment list is prescribed in CAR 91.01.6.

135.04.8 TRAINING RECORDS

1. Training records

(1) An air service operator shall, for each person who is required to receive training in terms of Subpart 3, establish and maintain a record of -

(a) a copy of a signed personnel licence or validation of foreign licence, if applicable;

(b) if applicable, the persons current medical certificate;

(c) the dates on which the person, while in the operator's employ, successfully completed any training, pilot proficiency check (PPC) or competency check (CC), examination or other crew member skills test required in terms of Subpart 3 or obtained any qualification required in terms of Part 61 or this TS;

(d) the report of any check or skills test completed;

(e) information relating to any failure of the person, while in the operator's employ, to successfully complete any training, PPC or examination required in terms of Subpart 3 or to obtain any qualification required in terms of Part 61 or this TS;

(f) the type of aircraft or flight training equipment used for any training, PPC, line check or qualification required under this Subpart; and

(g) any certificate required to be kept in terms of Subpart 3.

(2) An operator shall maintain a system for recording the qualifications and training of instructional and examining staff, as appropriate.

(3) An operator shall retain a copy of the most recent written examination completed by each person for each type of aircraft, where applicable, for which the person has a qualification.

(4) An operator shall retain the records referred to in paragraphs (1)(c) and (d) and a record of each PPC for at least three years.

(5) An operator shall retain any certificate referred to in paragraph (1)(g) for at least 90 days beyond the duration of its validity period.

135.04.9 LOAD AND TRIM SHEET

1. Load and trim sheet

(1) The load and trim sheet must contain the following information -

(a) the aeroplane registration and type;

(b) the flight identification number and date;

(c) the identity of the pilot-in-command;

(d) the identity of the person who prepared the document;

(e) the dry operating mass and the corresponding CG of the aeroplane;

(f) the mass of the fuel at take-off and the mass of trip fuel;

(g) the mass of consumables other than fuel;

(h) the components of the load including passengers, baggage, freight and ballast;

(i) the take-off mass, landing mass and zero fuel mass;

(j) the load distribution;

(k) the applicable aeroplane CG positions; and

(l) the limiting mass and CG values.

(2) The person superintending the loading of an aeroplane must certify that the load distribution is in accordance with the requirements prescribed in the operations manual or flight manual and that the maximum certificated mass has not been exceeded.

(3) The load and trim sheet must be signed by the pilot-in-command (PIC) prior to departure unless the load and trim sheet is sent to the aeroplane by electronic data transfer, in which case the PIC shall ensure it has been reviewed and pilots satisfied the flight is safe for departure. The means by which the PIC certifies acceptance of the load and trim sheet shall be published in the company operations manual.

(4) A copy of the final load and trim sheet, as accepted by the pilot-in-command, must be available at a location on the ground as determined by the operator.

135.05.9 FIRST AID KITS

1. Standard first aid kits

2. Standard first aid kits

(1) The medical supplies to be included in the standard first aid kit for aeroplanes operated in terms of Part 135 shall, as a minimum, - be as prescribed in TS 91.04.13, with the recommended addition of a temperature reading device (non-mercury)

Note - *The operator shall ensure that only Schedule 0 medication is included in the first aid kits.*

(2) Unless the standard first aid kit is clearly visible, its location must be indicated by a placard or sign. Appropriate symbols may be used to supplement the placard or sign.

135.05.12 FLIGHT RECORDERS

1. Flight recorders - general

(1) Flight recorders comprise four systems -

(a) a flight data recorder (FDR);

(b) a cockpit voice recorder (CVR);

(c) an airborne image recorder (AIR); and

(d) a data link recorder (DLR).

(2) Lightweight flight recorders comprise four systems -

(a) an aircraft data recording system (ADRS);

(b) a cockpit audio recording system (CARS);

(c) an airborne image recording system (AIRS); and

(d) a data link recording system (DLRS).

Note - *Image and data link information may be recorded on either the CVR, FDR, CARS or the ADRS.*

2. Flight recorder installation

Each flight recorder installed in the aeroplanes specified in this technical standard shall, in accordance with the requirements of the manufacturer or organisation responsible for its installation, as applicable, be located and installed in such a manner that maximum practicable protection is provided, in order that, in the event of an accident or incident, the recorded data may be recovered in a preserved and intelligible state.

3. Crashworthiness and fire protection specifications

(1) FDR, CVR, AIRS and DLRS performance requirements and industry crashworthiness and fire protection specifications are as contained in the EUROCAE ED-112, Minimum Operational Performance Specification (MOPS) for Crash Protected Airborne Recorder Systems, or equivalent documents.

(2) ADRS and CARS performance requirements and industry crashworthiness and fire protection specifications are as contained in the EUROCAE ED-155, Minimum Operational Performance Specification (MOPS) for Lightweight Flight Recorder Systems, or equivalent documents.

4. Inspections of flight recorders

(1) Prior to the first flight of the day, the built-in test features on the flight deck for the CVR, FDR and Flight Data Acquisition Unit (FDAU), when installed, shall be monitored.

(2) Annual inspections shall be carried out as follows -

(a) the read-out of the recorded data from the FDR and CVR should confirm that the recorder operates correctly for the nominal duration of the recording;

(b) the analysis of the FDR should evaluate the quality of the recorded data to determine whether the bit error rate is within acceptable limits and to determine the nature and distribution of the errors;

(c) a complete flight from the FDR should be examined in engineering units to evaluate the validity of all recorded parameters. Particular attention should be given to parameters from sensors dedicated to the FDR. Parameters taken from the aircraft's electrical bus system need not be checked if their serviceability can be detected by other aircraft systems;

(d) the read-out facility should have the necessary software to accurately convert the recorded values to engineering units and to determine the status of discrete signals;

(e) an annual examination of the recorded signal on the CVR should be carried out by re-play of the CVR recording. While installed in the aircraft, the CVR should record test signals from each aircraft source and from relevant external sources to ensure that all required signals meet intelligibility standards; and

(f) where practicable, during the annual examination, a sample of in-flight recordings of the CVR should be examined for evidence that the intelligibility of the signal is acceptable.

(3) The results of the annual inspections shall be recorded and retained for a period of five years calculated from the date of such check.

(4) Flight recorder systems should be considered unserviceable if there is a significant period of poor quality data, unintelligible signals or if one or more of the mandatory parameters is not recorded correctly.

(5) When requested, a report of the annual inspection should be made available to the Executive Director for monitoring purposes.

(6) Calibration of the FDR-system -

(a) for those parameters that have sensors dedicated only to the FDR and are not checked by other means, recalibration shall be carried out at least every five years in accordance with the recommendations of the sensor manufacturer to determine any discrepancies in the engineering conversion routines for the mandatory parameters and to ensure that parameters are being recorded within the calibration tolerances;

(b) when the parameters of altitude and airspeed are provided by sensors that are dedicated to the FDR system, there shall be a recalibration performed as recommended by the sensor manufacturer, or at least every two years; and

(c) should it be evident during FDR download that a parameter was not recorded, or an error occurred on a parameter or sensor, the error shall be rectified as per the maintenance manual. The FDR shall be in operation for a maximum of three flights and downloads performed to verify if an error been rectified.

5. Flight recorder specifications

All digital flight recorders shall comply with one of the following specifications as applicable -

(a) ARINC 542A;

(b) ARINC 573-717;

(c) ARINC 717; or

(d) ICAO Annex 6, Part I, Appendix 7.

6. Combination recorders

(1) All aeroplanes of a maximum certificated take-off mass of over 15 000 kg for which the type certificate is first issued on or after 1 January 2016 and which are required to be equipped with both a CVR and an FDR, shall be equipped with two combination recorders (FDR/CVR).

(2) Aeroplanes fitted with combination flight data and aural recorders shall, as far as practicable, locate one recorder close to the cockpit and the other as far aft as possible.

7. Airborne image recorder

(1) Airborne image recorders (AIR) are classified as follows -

(a) a Class A AIR captures the general cockpit area in order to provide data supplemental to conventional flight recorders;

Note - *To respect crew privacy, the cockpit area view may be designed as far as practical to exclude the head and shoulders of crew members whilst seated in their normal operating position.*

(b) a Class B AIR captures data link message displays; and

(c) a Class C AIR captures instruments and control panels.

Note - *A Class C AIR may be considered as a means for recording flight data where it is not practical or is prohibitively expensive to record on an FDR or where an FDR is not required.*

(2) For aeroplanes equipped with an AIR, the AIR shall start to record prior to the aeroplane moving under its own power and record continuously until the termination of the flight when the aeroplane is no longer capable of moving under its own power. In addition, depending on the availability of electrical power, the AIR must start to record as early as possible during the cockpit checks prior to engine start at the beginning of the flight until the cockpit checks immediately following engine shutdown at the end of the flight.

8. Aircraft data recording systems

(1) Operators of aircraft using aircraft data recording systems (ADRS) shall ensure the ADRS is capable of recording, as appropriate to the aeroplane, at least the essential (E) parameters in the following table -

TABLE A1

PARAMETER GUIDANCE CHARACTERISTICS FOR AIRCRAFT DATA RECORDING SYSTEMS

N°	Parameter name	Minimum recording range	Maximum recording interval in seconds	Minimum recording accuracy	Minimum recording resolution	Remarks
1	Heading: a) Heading (Magnetic or True) b) Yaw rate	±180° ±300°/s	1 0.25	±2° ±1% + drift of 360°/h	0.5° 2°/s	*Heading is preferred, if not available, yaw rate shall be recorded
2	Pitch: A) Pitch attitude b) Pitch rate	±90° ±300°/s	0.25 0.25	±2° ±1% + drift of 360°/h	0.5° 2°/s	*Pitch attitude is preferred, if not available, pitch rate shall be recorded
3	Roll: (a)Roll attitude (b) Roll rate	±180° ±300°/s	0.25 0.25	±2° ±1% + drift of 360°/h	0.5° 2°/s	*Roll attitude is preferred, if not available, roll rate shall be recorded

N°	Parameter name	Minimum recording range	Maximum recording interval in seconds	Minimum recording accuracy	Minimum recording resolution	Remarks
4	Positioning system (a)Time	24 hours	1	±0.5s	0.1	UCT time preferred where available
	(b)Latitude/Longitude	Latitude: ±90° Longitude: ±180°	2 (if available)	As installed (0.00015° recommended)	0.00005°	
	(c) Altitude	–300 m (–1 000 ft) to maximum certificated altitude of aircraft +1 500 m (5 000 ft)	2 (if available)	As installed (±15 m (±50 ft) recommended)	1.5m (5 ft)	
	(d) Ground speed	0-1 000 kt	2 (if available)	As installed (±5 kt recommended)	1 kt	
	(e)Track	0-360°	2 (if available)	As installed (±2° recommended)	0.5°	
	(f) Estimate error	Available range	2 (if available)	As installed	As installed	Shall be recorded if readily available
5	Normal acceleration	–3 g to + 6g	0.25 (0.125 if available)	As installed (±0.09 g excluding a datum error of ±0.045 g recommended)	0.004 g	
6	Longitudinal acceleration	±1 g(*)	0.25 (0.125 if available)	As installed (±0.015 g excluding a datum error of ±0.05 g recommended)	0.004 g	
7	Lateral acceleration	±1 g(*)	0.25 (0.125 if available)	As installed (±0.015 g excluding a datum error of ±0.05 g recommended)	0.004 g	
8	External static pressure (or pressure altitude)	34.4 mb (3.44 in-Hg) to 310.2 mb (31.02 in-Hg) or available sensor range	1	As installed (±1 mb (0.1 in-Hg) or ±30 m (±100 ft) to ±210 m (±700 ft) recommended)	0.1 mb (0.01 in-Hg) or 1.5 m (5 ft)	
9	Outside air temperature (or total air temperature)	–50° to +90°C or available sensor range	2	As installed (±2°C recommended)	1°C	

N°	Parameter name	Minimum recording range	Maximum recording interval in seconds	Minimum recording accuracy	Minimum recording resolution	Remarks
10	Indicated air speed	As the installed pilot display measuring system or available sensor range	1	As installed (±3% recommended)	1 kt (0.5 kt recommended)	
11	Engine RPM (*)	Full range including overspeed condition	Each engine each second	As installed	0.2% of full range	
12	Engine oil pressure	Full range	Each engine each second	As installed (5% of full range recommended)	2% of full range	
13	Engine oil temperature	Full range	Each engine each second	As installed (5% of full range recommended)	2% of full range	
14	Fuel flow or pressure	Full range	Each engine each second	As installed	2% of full range	
15	Manifold pressure	Full range	Each engine each second	As installed	0.2% of full range	
16	Engine thrust/power/ torque parameters required to determine propulsive thrust/power*	Full range	Each engine each second	As installed	0.1% of full range	* Sufficient parameters e.g. EPR/N1 or torque/Np as appropriate to the particular engine shall be recorded to determine power in both normal and reverse thrust. A margin for possible overspeed shall be provided
17	Engine gas generator speed (Ng)	0–150%	Each engine each second	As installed	0.2% of full range	
18	Free power turbine speed (Nf)	0–150%	Each engine each second	As installed	0.2% of full range	
19	Coolant temperature (*)	Full range	1	As installed (±5°C recommended	1°C	
20	Main voltage	Full range	Each engine each second	As installed	1 Volt	
21	Cylinder head temperature	Full range	Each cylinder each second	As installed	2% of full range	
22	Fuel quantity	Full range	4	As installed	1% of full range	
23	Primary flight control surface position	Full range	0.25	As installed	0.2% of full range	
24				As installed		

N°	Parameter name	Minimum recording range	Maximum recording interval in seconds	Minimum recording accuracy	Minimum recording resolution	Remarks
25	Exhaust gas temperature	Full range	Each engine each second	As installed	2% of full range	
26	Emergency voltage	Full range	Each engine each second	As installed	1 Volt	
27	Trim surface position	Full range or each discrete position	1	As installed	0.3% of full range	
28	Landing gear position	Each discrete position*	Each gear every two seconds	As installed		*Where available, record up-and-locked and down-and-locked position
29	Novel/unique aircraft features	As required	As required	As required	As required	

(2) Documentation concerning parameter allocation, conversion equations, periodic calibration and other serviceability/maintenance information shall be maintained by the operator. The documentation needs to be sufficient to ensure that accident investigation authorities have the necessary information to read out the data in engineering units.

(3) The documentation referred to in paragraph (2) shall be in electronic format where possible and take account of industry standards.

Note - *Industry specification for documentation concerning flight recorder parameters may be found in the ARINC 647A, Flight Recorder Electronic Documentation, or equivalent document.*

(4) An aeroplane that is required to be equipped with CARS, and for which the individual certificate of airworthiness is first issued on or after 1 January 2025, shall be equipped with a CARS which shall retain the information recorded during at least the last two hours of its operation.

(5) An aeroplane for which the individual certificate of airworthiness was first issued before 1 January 2016, that are required to carry a CVR and are modified on or after 1 January 2016 to use any of the data link communications applications referred to in Document NAM-CATS 135.05.20 shall record the data link communications messages on a crash-protected flight recorder.

135.05.13 FLIGHT DATA RECORDERS

1. Aeroplanes for which flight data recorders are required

An operator shall ensure any aeroplane operated in a commercial air transport operation is equipped with a flight data recorder (FDR) in accordance with the following table -

TABLE A1

AEROPLANE FLIGHT DATA RECORDER REQUIREMENTS

Group	Conditions. See note 1.	Maximum Certificated Take-off Mass (kg)	Propulsion System	FDR T.A.A.A.H See note 2.	FDR Type 1	FDR Type 1A	FDR Type II	Class C AIR or AIRS	ADRS
1	Application for type certification submitted to Contracting State on or after 1 January 2016 **See note 3**	≤5700	Turbine				X	X	X
2	Individual certificate of airworthiness first issued on or after 1 January 1989	> 27000	All		X				
3	Individual certificate of airworthiness first issued on or after 1 January 1989	> 5700 but ≤ 27000	All				X		
4	Individual certificate of airworthiness first issued on or after 1 January 1987 but before 1 January 1989 **Except those in Group 5**	> 5700	Turbine	X					
5	Individual certificate of airworthiness first issued on or after 1 January 1987 but before 1 January 1989 whose types of which the prototype was certificated by the appropriate national authority after 30 September 1969	> 27000	Turbine				X		
6	Individual certificate of airworthiness first issued before 1 January 1987	> 5700	Turbine	X					
7	Individual certificate of airworthiness first issued after 1 January 2005	> 5700	All			X			

Notes -

1. *For the purposes of this technical standard, any reference to the application for the type certification being submitted to a Contracting State on or after a specified date means the date an application is made for a new aircraft type, not the date of certification of particular aircraft variants or derivative models. Any reference to the individual certificate of airworthiness being issued first on or after a specified date means the first time a certificate of airworthiness is issued for a new individual aircraft serial number that has just come off the assembly line.*

2. *FDR T.A.A.A.H means a FDR that records time, altitude, airspeed, normal acceleration and heading.*

3. *The recording system may be any one of the three.*

TABLE C1

AEROPLANE AGE AND REQUIREMENTS

The weight of the aircraft (take-off mass)		Age of Aircraft	Parameters to be recorded by FDR
1	5700kg or Less	All turbine engine aeroplanes for which the individual Certificate of airworthiness is first issued on or after 01 Jan 2016.	(a) At least the first 16 parameters in the table in subsection 5 (10) (b)A class C AIR or AIRS which shall record at least the flight path and speed parameters displayed to pilots as defined in notes below the table or (c) An ADRS which shall record at least the first 7 parameters listed in the table in subsection 5(11)
2	Over 27000kg	All aeroplanes for which the individual Certificate of airworthiness is first issued on or after 01 Jan 1989.	At least the first 32 parameters in the table in subsection 5 (10)
3	Over 2700kg up to and including 5700kg	All aeroplanes for which the individual Certificate of airworthiness is first issued on or after 01 Jan 1989.	At least the first 16 parameters in the table in subsection 5 (10)
4	5 700kg or less	All multi-engine turbine engine aeroplanes for which individual certificate of airworthiness first issued on or after 01 January 1990	At least the first 16 parameters in the table in subsection 5 (10)
5	Maximum 5 700kg	All multi-engine aircraft for which individual airworthiness certificate is first issued on or after 01 January 1990	At least the first 16 parameters in the table in subsection 5 (10)
6	Over 5700kg	All turbine-engined aeroplanes, for which the individual certificate of airworthiness was first issued before 01 January 1989,with a maximum certificated take-off mass of over 5700 kg, except those mentioned in item no 7 in this table	At least the first 5 parameters in the table in subsection 5 (10)
7	Over 5700kg	All turbine engine aeroplanes, for which the individual certificate of airworthiness was first issued on or after 01 January 1987 but before 01 January 1989, except those mentioned in item no 7 in this table	At least the first 9 parameters in the table in subsection 5 (10)
8	Over 27000kg	Individual certificate of airworthiness first issued on or after 01 January 1987 but before 01 January 1989	At least the first 16 parameters in the table in subsection 5 (10)

The weight of the aircraft (take-off mass)		Age of Aircraft	Parameters to be recorded by FDR
		types of which the prototype was certified by the appropriate authority after 30 September 1969	
9	Over 27000kg	All turbine engine aeroplanes for which the individual certificate of airworthiness was first issued before 01 Jan 1987 but the prototype was certified by the appropriate authority after 30 September 1969	At least the first 05 parameters listed in the table in subsection 5(10) and meet the objectives of: (a) the attitude of the aeroplane in achieving its flight path; and (b) the basic forces acting upon the aeroplane resulting in the achieved flight path and the origin of such basic forces.
10	Over 5700kg	First individual airworthiness certificate issued on or after 01 January 2005	Record at least the first 78 parameters listed in the table in subsection 5(10)
11	Over 5700kg	All aeroplanes with a mass of over 5700kg Take Off Mass of which application for type certification is submitted to the contracting state on or after 1 January 2023	At least the first 82 parameters in the table in subsection 5(10)

Notes *If further FDR recording capacity is available, recording of the following additional information shall be considered: a) operational information from electronic display systems, such as electronic flight instrument systems (EFIS), electronic centralised aircraft monitor (ECAM) and engine indication and crew alerting systems (EICAS). Use the following order of priority:*

1. *parameters selected by the flight crew relating to the desired flight path, e.g. barometric pressure setting, selected altitude, selected airspeed, decision height, and autoflight system engagement and mode indications if not recorded from another source;*
2. *display system selection/status, e.g. SECTOR, PLAN, ROSE, NAV, WXR, COMPOSITE, COPY, etc.*
3. *warnings and alerts; and*
4. *the identity of displayed pages for emergency procedures and checklists; and b) retardation information including brake application for use in the investigation of landing overruns and rejected take-offs.*

2. FDR parameters

(1) A Type IA FDR shall be capable of recording, as appropriate to the aeroplane, at least the 78 parameters in the table in paragraph (10).

(2) A Type I FDR shall be capable of recording, as appropriate to the aeroplane, at least the first 32 parameters in the table in paragraph (10).

(3) Type II and IIA FDRs shall be capable of recording, as appropriate to the aeroplane, at least the first 16 parameters in the table in paragraph (10). In addition, a Type IIA FDR shall retain sufficient information from the preceding take-off for calibration purposes.

(4) The parameters that satisfy the requirements for FDRs are listed in the paragraphs below. The number of parameters to be recorded shall depend on aeroplane complexity. The parameters without an asterisk (*) are mandatory parameters which shall be recorded regardless of aeroplane complexity. In addition, the parameters designated by an asterisk (*) shall be recorded if an information data source for the parameter is used by aeroplane systems or the flight crew to operate the aeroplane. However, other parameters may be substituted with due regard to the aeroplane type and the characteristics of the recording equipment.

(5) The measurement range, recording interval and accuracy of parameters on installed FDR equipment shall meet the specifications in the following table -

TABLE D1

PARAMETERS FOR AEROPLANE FLIGHT DATA RECORDERS

Serial number	Parameter	Applicability	Measurement range	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR read-out)	Recording resolution
1	Time (UTC when available, otherwise relative time count or GNSS time sync)		24 hours	4	±0.125%/h	1s
2	Pressure-altitude		–300 m (–1 000 ft) to maximum certificated altitude of aircraft +1 500 m (+5 000 ft)	1	±30 m to ±200 m (±100 ft to ±700 ft)	1.5 m (5 ft)
3	Indicated airspeed or calibrated airspeed		95 km/h (50 kt) to max V_{so} *(note 1)* V_{so} to 1.2 V_D *(note 2)*	1	±5% ±3%	1 kt (0.5 kt recommended)
4	Heading (primary flight crew reference)		360°	1	±2°	0.5°

Serial number	Parameter	Applicability	Measurement range	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR read-out)	Recording resolution
5	Normal acceleration *Note 8*	Application for type certification is submitted to a Contracting State before 1 January 2016	–3 g to +6 g	0.125	±1% of maximum range excluding datum error of ±5%	0.004 g
		Application for type certification is submitted to a Contracting State on or after 1 January 2016	–3 g to +6 g	0.0625	±1% of maximum range excluding datum error of ±5%	0.004 g
6	Pitch attitude		±75° or usable range whichever is greater	0.25	±2°	0.5°
7	Roll attitude		±180°	0.25	±2°	0.5°
8	Radio transmission keying		On-off (one discrete)	1		
9	Power on each engine *Note 3*		Full range	1 (per engine)	±2%	0.2% of full range or the resolution required to operate the aircraft
10*	Trailing edge flap and cockpit control selection		Full range or each discrete position	2	±5% or as pilot's indicator	0.5% of full range or the resolution required to operate the aircraft
11*	Leading edge flap and cockpit control selection		Full range or each discrete position	2	±5% or as pilot's indicator	0.5% of full range or the resolution required to operate the aircraft
12*	Thrust reverser position		Stowed, in transit, &reverse		1 (per engine)	
13*	Ground spoiler/speed brake selection (selection and position)		Full range or each discrete position	1	±2% unless higher accuracy uniquely required	0.2% of full range
14	Outside air temperature		Sensor range	2	±2°C	0.3°C
15*	Autopilot/auto		A suitable combination	1		

Serial number	Parameter	Applicability	Measurement range	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR read-out)	Recording resolution
	throttle/AFCS mode and engagement status		of discretes			
16	Longitudinal acceleration *Note 8*	Application for type certification submitted to a Contracting State before 1 January 2016	±1 g	0.25	±0.015 g excluding a datum error of ±0.05 g	0.004 g
		Application for type certification submitted to a Contracting State on or after 1 January 2016	±1 g	0.0625	±0.015 g excluding a datum error of ±0.05 g	0.004 g
17	Lateral acceleration *Note 8*	Application for type certification submitted to a Contracting State before 1 January 2016	±1 g	0.25	±0.015 g excluding a datum error of ±0.05 g	0.004
		Application for type certification submitted to a Contracting State on or after 1 January 2016	±1 g	0.0625	±0.015 g excluding a datum error of ±0.05 g	0.004 g
18	Pilot input and/or control surface position-primary controls (pitch, roll, yaw) *notes 4 & 8*	Application for type certification submitted to a Contracting State before 1 January 2016	Full range	0.25	±2° unless higher accuracy uniquely required	0.2% of full range or as installed
		Application for type certification submitted to a Contracting State on or after 1 January 2016	Full range	0.125	±2° unless higher accuracy uniquely required	0.2% of full range or as installed

Serial number	Parameter	Applicability	Measurement range	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR read-out)	Recording resolution
19	Pitch trim position		Full range	1	±3% unless higher accuracy uniquely required	0.3% of full range or as installed
20*	Radio altitude		–6 m to 750 m (–20 ft to 2 500 ft)	1	±0.6 m (±2 ft) or ±3% whichever is greater below 150m (500 ft) and ±5% above 150 m (500 ft)	0.3 m (1 ft) below 150 m (500 ft) 0.3 m (1 ft) + 0.5% of full range above 150 m (500 ft)
21*	Vertical beam deviation (ILS/GNSS/GLS glide path, MLS elevation, IRNAV/IAN vertical deviation)		Signal range	1	±3%	0.3% of full range
22*	Horizontal beam deviation (ILS/GNSS/GLS localizer, MLS azimuth, IRNAV/IAN lateral deviation)		Signal range	1	±3%	0.3% of full range
23	Marker beacon passage		Discrete	1		
24	Master warning		Discrete	1		
25	Each NAV receiver frequency Selection *note 5*		Full range	4	As installed	
26*	DME 1 and 2 distance (includes Distance to runway threshold (GLS) and Distance to missed approach point (IRNAV/IAN)) *notes 5 & 6*		0 – 370 km (0 – 200 NM)	4	As installed	1 852 m (1 NM)
27	Air/ground status		Discrete	1		
28*	GPWS/TAWS/GCAS status (selection of terrain display mode including pop-up display status) and (terrain alerts, both cautions and warnings, and		Discrete	1		

Serial number	Parameter	Applicability	Measurement range	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR read-out)	Recording resolution
	advisories) and (on/off switch position)					
29*	Angle of attack		Full range	0.5	As installed	0.3 % of full range
30*	Hydraulics, each system (low pressure)		Discrete	2		0.5% of full range
31*	Navigation data (latitude/longitude, ground speed, and drift angle) *note 7*		As installed	1	As installed	
32*	Landing gear and gear selector position		Discrete	4	As installed	
33*	Groundspeed		As installed	1	Data shall be obtained from the most accurate system	1 kt
34	Brakes (left and right brake pressure, left and right brake pedal position)		(Maximum metered brake range, discretes or full range)	1	±5%	2% of full range
35*	Additional engine parameters (EPR, N_1, indicated vibration level, N_2, EGT, fuel flow, fuel cut-off lever position, N_3, engine fuel metering valve position)	Engine fuel metering valve position: Application for type certification is submitted to a Contracting State on or after 1 January 2023	As installed	Each engine each second	As installed	2% of full range
36*	TCAS/ACAS (traffic alert and collision avoidance system)		Discretes	1	As installed	
37*	Wind shear warning		Discrete	1	As installed	
38*	Selected barometric setting (pilot, co-pilot)		As installed	64	As installed	0.1 mb (0.01 in-Hg)
39*	Selected altitude (all pilot selectable modes of operation)		As installed	1	As installed	Sufficient to determine crew selection

Serial number	Parameter	Applicability	Measurement range	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR read-out)	Recording resolution
40*	Selected speed (all pilot selectable modes of operation)		As installed	1	As installed	Sufficient to determine crew selection
41*	Selected Mach (all pilot selectable modes of operation)		As installed	1	As installed	Sufficient to determine crew selection
42*	Selected vertical speed (all pilot selectable modes of operation)		As installed	1	As installed	Sufficient to determine crew selection
43*	Selected heading (all pilot selectable modes of operation)		As installed	1	As installed	Sufficient to determine crew selection
44*	Selected flight path (all pilot selectable modes of operation) (course/DSTRK, path angle, final approach path (IRNAV/IAN))			1	As installed	
45*	Selected decision height		As installed	64	As installed	Sufficient to determine crew selection
46*	EFIS display format (pilot, co-pilot)		Discrete(s)	4	As installed	
47*	Multi-function/engine/alerts display format		Discrete(s)	4	As installed	
48*	AC electrical bus status		Discrete(s)	4	As installed	
49*	DC electrical bus status		Discrete(s)	4	As installed	
50*	Engine bleed valve position		Discrete(s)	4	As installed	
51*	APU bleed valve position		Discrete(s)	4	As installed	
52*	Computer failure		Discrete(s)	4	As installed	
53*	Engine thrust command		As installed	2	As installed	
54*	Engine thrust target		As installed	4	As installed	2% of full range
55*	Computed centre of gravity		As installed	64	As installed	1% of full range

Serial number	Parameter	Applicability	Measurement range	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR read-out)	Recording resolution
56*	Fuel quantity in CG trim tank		As installed	64	As installed	1% of full range
57*	Head up display in use		As installed	4	As installed	
58*	Para visual display on/off		As installed	1	As installed	
59*	Operational stall protection, stick shaker and pusher activation		As installed	1	As installed	
60*	Primary navigation system reference (GNSS, INS, VOR/DME, MLS, Loran C, localizer glideslope)		As installed	4	As installed	
61*	Ice detection		As installed	4	As installed	
62*	Engine warning each engine vibration		As installed	1	As installed	
63*	Engine warning each engine over temperature		As installed	1	As installed	
64*	Engine warning each engine oil pressure low		As installed	1	As installed	
65*	Engine warning each engine over speed		As installed	1	As installed	
66*	Yaw trim surface position		Full range	2	±3% unless higher accuracy uniquely required	0.3% of full range
67*	Roll trim surface position		Full range	2	±3% unless higher accuracy uniquely required	0.3% of full range
68*	Yaw or sideslip angle		Full range	1	±5%	0.5°
69*	De-icing and/or anti-icing systems selection		Discrete(s)	4		
70*	Hydraulic pressure (each system)		Full range	2	±5%	100 psi
71*	Loss of cabin pressure		Discrete	1		

Serial number	Parameter	Applicability	Measurement range	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR read-out)	Recording resolution
72*	Cockpit trim control input position, Pitch		Full range	1	±5%	0.2% of full range or as installed
73*	Cockpit trim control input position, Roll		Full range	1	±5%	0.2% of full range or as installed
74*	Cockpit trim control input position, Yaw		Full range	1	±5%	0.2% of full range or as installed
75*	All cockpit flight control input forces (control wheel, control column, rudder pedal)		Full range (±311 N (±70 lbf), ± 378 N (±85 lbf), ± 734 N (±165 lbf))	1	±5%	0.2% of full range or as installed
76*	Event marker		Discrete	1		
77*	Date		365 days	64		
78*	ANP or EPE or EPU		As installed	4	As installed	
79*	Cabin pressure altitude	Application for type certification submitted to a Contracting State on or after 1 January 2023	As installed (0 ft to 40 000 ft recommended)	1	As installed	100 ft
80*	Aeroplane computed weight	Application for type certification submitted to a Contracting State on or after 1 January 2023	As installed	64	As installed	1% of full range
81*	Flight director command	Application for type certification submitted to a Contracting State on or after 1 January 2023	Full range	1	± 2°	0.5°
82*	Vertical speed	Application for type certification submitted to a Contracting State on or after 1 January 2023	As installed	0.25	As installed (32 ft/min recommended)	16 ft/min

Notes.—

1. *V_{SO} stalling speed or minimum steady flight speed in the landing configuration is in Section "Abbreviations and Symbols".*
2. *V_D design diving speed.*
3. *Record sufficient inputs to determine power.*
4. *For aeroplanes with control systems in which movement of a control surface shall back drive the pilot's control, ''or'' applies. For aeroplanes with control systems in which movement of a control surface shall not back drive the pilot's control, ''and'' applies. In aeroplanes with split surfaces, a suitable combination of inputs is acceptable in lieu of recording each surface separately. In aeroplanes with independent pilot input on primary controls, each pilot input on primary controls needs to be recorded separately.*
5. *If signal available in digital form.*
6. *Recording of latitude and longitude from INS or other navigation system is a preferred alternative.*
7. *If signals readily available.*
8. *It is not intended that aeroplanes issued with an individual certificate of airworthiness before 1 January 2016 be modified to meet the measurement range, maximum sampling and recording interval, accuracy limits or recording resolution description detailed in this Part.*
9. *The number of parameters to be recorded shall depend on aeroplane complexity. The parameters without an asterisk (*) are mandatory parameters which shall be recorded regardless of aeroplane complexity.*

135.05.14 COCKPIT VOICE RECORDERS

1. Aeroplane for which a voice or aural is required

Notes-

1. *CVR performance requirements are as contained in the EUROCAE ED-112, Minimum Operational Performance Specification (MOPS) document for Flight Recorder Systems of the European Organization for Civil Aviation Equipment (EUROCAE) for Crash Protected Airborne Recorder Systems, or equivalent documents.*
2. *CARS performance requirements are as contained in the EUROCAE ED-155, MOPS for Lightweight Flight Recorder Systems, or equivalent documents.*

(1) An operator shall ensure any aeroplane operated in a commercial air transport operation is equipped with a CVR or CARS capable of recording the aural environment of the flight deck during flight time in accordance with the following table-

TABLE E1

AEROPLANE VOICE OR AURAL RECORDERS REQUIREMENTS

Group (See note 1)	Conditions (See note 2)	Maximum Certificated Take-Off Mass (kg)	Propulsion System	Recording retained for the last 30 minutes of operation	Recording retained for the last 2 hours of operation	Recording retained for at least the last 25 hours of operation
1	Application for type certification submitted to Contracting State on or after 1 January 2016 and required to be operated by more than one pilot	> 2250 but ≤ 5700	Turbine		X	
2	Individual certificate of Airworthiness first issued on or after 1 January 2003	> 5700	All		X	
3	Individual certificate of Airworthiness first issued on or after 1 January 1987	> 5700	All	-	X	
4	Individual certificate of Airworthiness first issued before 1 January 1987 whose types of which the prototype was certificated by the appropriate national authority after 30 September 1969	> 5700 >= 27000	Turbine	-	X	
5	Individual certificate of airworthiness is first issued on or after 1 January 2022	> 27000	All			X

Notes -

1. Group 2, 3 and 4 recorders shall be CVRs, Group 1 shall be either a CVR or a CARS.

2. For the purposes of this regulation, any reference to the application for the type certification being submitted to a Contracting State on or after a specified date means the date an application is made for a new aircraft type, not the date of certification of particular aircraft variants or derivative models. Any reference to the individual certificate of airworthiness being issued first on or after a specified date means the first time a certificate of airworthiness is issued for a new individual aircraft serial number that has just come off the assembly line.

2. CVR specifications -

Notes-

(1) Any recorder required to be installed shall have an independent power source with the capability of automatically engaging and providing ten minutes of operation whenever aircraft power to the recorder ceases, either by normal shutdown or by any other loss of power to the recorder.

(2) For all aeroplanes for which the type certificate is first issued on or after 1 January 2016 and which are required to be fitted with a CVR, the CVR shall be provided with an independent power source that shall power exclusively the CVR and the cockpit area microphone components. In installations where two CVRs are fitted in aeroplanes, the forward CVR shall be provided with an independent power source.

Note - *When the CVR function is combined with other recording functions within the same unit, powering the other functions is allowed.*

(3) For all aeroplanes for which the individual certificate of airworthiness is first issued on or after 1 January 2016 and which are required to be fitted with a CVR, the CVR shall be provided with an independent power source. In installations where two CVRs are fitted in aeroplanes, the forward CVR shall be provided with an independent power source.

(4) The CVR shall record on four separate channels, or more, at least the following -

(a) voice communication transmitted from or received in the aeroplane by radio;

(b) aural environment on the flight deck;

(c) voice communication of flight crew members on the flight deck using the aeroplane's interphone system, if installed;

(d) voice or audio signals identifying navigation or approach aids introduced in the headset or speaker; and

(e) voice communication of flight crew members using the passenger address system, if installed

(5) The CARS shall record on two separate channels, or more, at least the following -

(a) voice communication transmitted from or received in the aeroplane by radio;

(b) aural environment on the flight deck; and

(c) voice communication of flight crew members on the flight deck using the aeroplane's interphone system, if installed.

(6) The CVR shall be capable of recording on at least four channels simultaneously. On a tape-based CVR, to ensure accurate time correlation between channels, the CVR is to record in an in-line format. If a bidirectional configuration is used, the inline format and channel allocation shall be retained in both directions.

(7) The preferred track channel allocation is as follows -

(a) Channel 1 - co-pilot headphones and live boom microphone;

(b) Channel 2 - pilot headphones and live boom microphone;

(c) Channel 3 - area microphone; and

(d) Channel 4 - time reference plus the third and fourth crew members' headphone and live microphone, if applicable.

Notes -

1. Channel 1 is to be located closest to the base of the recording head.

2. The preferred channel allocation presumes use of current conventional magnetic tape transport mechanisms and is specified because the outer edges of the tape have a higher risk of damage than the middle. It is not intended to preclude use of alternative recording media where such constraints may not apply.

135.05.15 DATA LINK RECORDERS

1. Data link recorders - General

Notes -

1. Data link communications are currently conducted by either ATN-based or FANS 1/A-equipped aircraft.

2. A Class B AIR could be a means for recording data link communications applications messages to and from the aeroplanes where it is not practical or is prohibitively expensive to record those data link communications applications messages on FDR or CVR.

3. Data link recorders performance requirements are as contained in the EUROCAE ED-112, Minimum Operational Performance Specifications (MOPS) for Crash Protected Airborne Recorder Systems, or equivalent documents.

(1) The minimum recording duration of a data link recorder shall be equal to the duration of the CVR.

(2) Data link recording shall be able to be correlated to the recorded cockpit audio.

(3) Where the aircraft flightpath is authorised or controlled through the use of data link messages, all data link messages, both uplinks (to the aircraft) and downlinks (from the aircraft), shall be recorded on the aircraft. As far as practicable, the time the messages were displayed to the flight crew and the time of the responses shall be recorded.

Note - *Sufficient information to derive the content of the data link communications message and the time the messages were displayed to the flight crew is needed to determine an accurate sequence of events on board the aircraft*.

(4) Messages applying to the applications listed in this subsection shall be recorded. Applications without the asterisk (*) are mandatory applications which shall be recorded regardless of the system complexity. Applications with an (*) shall be recorded only as far as is practicable given the architecture of the system–

Item No.	***Application Type***	***Application Description***	***Recording Content***
(a)	Data link initiation	This includes any applications used to log on to or initiate data C-link service. In future, this will include air navigation system (FANS-1/A) and the aeronautical telecommunication network (ATN). These are ATS facilities notification (AFN) and context management (CM) respectively	C
(b)	Controller pilot communication	This includes an application used to exchange requests, Communication clearances, instructions, and reports between the flight crew and controllers on the ground. In FANS-1/A and ATN, this includes the CPDLC application. It also includes applications used for the exchange of oceanic (OCL) and departure clearances DCL as well as data link delivery of taxi clearances.	C
(c)	Addressed surveillance	This includes any surveillance application in which the automatic dependent surveillances-contract (ADS-C) ground sets up contracts for delivery of surveillance data. In FANS-1/A and ATN, this includes the ADS-C application. Where parametric data are reported within the message they shall be recorded unless data from the same source are recorded on the FDR.	C*

(d)	Flight information	This includes any service used for delivery of flight information to specific aircraft. This includes, for example, data link aviation weather report service (D-METAR), data link-automatic terminal service (D-ATIS), digital Notice to Airmen(D-NOTAM) and other textual data link services.	C
(e)	Aircraft broadcast surveillance	This includes elementary and enhanced surveillance systems, as well as automatic dependent surveillance - broadcast (ADS-B) output data. Where parametric data sent by the aeroplane are reported within the message they shall be recorded unless data from the same source are recorded on the FDR.	M*
(f)	Aeronautical operational control data	shall include any application transmitting or receiving control data used for aeronautical operational control purposes.	M*

Notes:

Key:

C*: means Complete contents recorded.

M**: means information that enables correlation to any associated records stored separately from the aeroplane.

**: Applications to be recorded only as far as is practicable given the architecture of the system.

135.06.2 APPLICATION FOR ISSUE OR AMENDMENT OF AN AIR OPERATOR CERTIFICATE AND OPERATIONS SPECIFICATIONS

1. Application for air operator certificate

(1) The form and manner referred to in CAR 135.06.2 in which application is made for the issuance or amendment of an air operator certificate (AOC) or operations specifications is referred to in this TS as the certification process. This process is designed to address the following certification actions -

(a) initial certification of an operator in terms of this Part;

(b) revision to any existing AOC or operations specification (OpSpec) issued in terms of this Part;

(c) corrective certification action of an existing AOC or OpSpec where deficiencies have been discovered through the continuing safety oversight program, or where appropriate; or

(d) any other certification action requested by an operator, operating or desiring to operate in terms of this Part.

(2) The process used to accomplish any certification activity entails the applicant successfully completing the five phases of certification. An application may not progress where any phase in not completed satisfactorily. On this issue an applicant is cautioned of the need to review the deficiencies as prescribed in CAR 135.06.3(3). The five phases of certification are comprised of -

(a) the pre-application phase;

(b) the formal application phase;

(c) the documentation review phase;

(d) the demonstration and inspection phase; and

(e) the certification phase.

(3) As part of the certification process an applicant shall complete and submit the following as a minimum -

(a) for operators of an international commercial operation, a statement of compliance (SOC) document, as specified in sub-regulation (6), which is the means by which the operator ensures him or herself and the Executive Director that the company will comply with all applicable regulatory requirements;

Note - *See paragraph (6) for more information on the SOC*.

(b) a number of application forms, depending upon the type of authority being applied for, which are intended to provide evidence of qualification for the specific authorities requested. The number and type of forms required vary with the size, scope and complexity of the proposed operation and are at the discretion of the certification officer; however, all will be made available to the applicant;

(c) copies of all required manuals; and

(d) payment of the application fee required by CAR 135.06.2(1) shall be non-refundable unless otherwise approved by the Executive Director.

(4) The applicant must submit to any inquiry or investigation, referred to in CAR 135.06.3(1), as deemed necessary in support of the application and to the certification audit referred to in CAR 135.06.5(1).

(5) With respect to the SOC, for each operator or applicant -

(a) a SOC is required when applying for international authority;

(b) the SOC shall be in the form of a complete listing of all parts of the regulations, including technical standards, as applicable to the operation the applicant is proposing, with space for the applicant to show how each regulation applicable to him or her has been met through specific reference to the operator's operations, maintenance or other required manuals;

(c) the SOC shall be updated by operators to reflect amended regulatory requirements or if the references showing the means of compliance in the SOC change as a result of amendments to the operator's manuals; and

(d) the Executive Director may require the completion of a SOC by any operator at any time deemed necessary in the interest of public safety.

2. Required management positions

(1) An operator shall employ its chief executive officer and person responsible for flight operations on a full-time basis to ensure proper control and supervision of its personnel and operation. An operator may employ on a full-time basis or contract the remaining managers as listed in CAR 135.06.2(6); however, if contracted, they shall devote sufficient time to the operator to ensure they can adequately discharge their duties. The operator shall designate the functions to be fulfilled by each of its managers. Section 4 of this TS states the minimum qualifications and responsibilities of the incumbents. The responsibilities listed in section 4 for the incumbent of any position may be assigned to another position as provided in paragraph (3).

(2) The application forms for the required managerial positions will be reviewed to ensure the minimum qualifications are met. The assessment process may involve the use of quizzes or interviews to establish the suitability of each nominee. Where a nominee is known within NCAA, the Executive Director may approve such nominee without the need for further assessment.

(3) An operator may use whatever title deemed necessary for its managers and may assign some of the responsibilities for a given position to another person or persons or the responsibilities of more than one position to one person; however, all the responsibilities noted in section 4 shall be assigned to a nominated manager and such assignment clearly identified in the operations manual. Furthermore, every person assigned any responsibility associated with a required position shall also meet the qualification requirements associated with the responsibilities assigned.

(4) An operator shall develop a method of ensuring that, in the absence of a responsible manager for any reason, all the responsibilities of that manager are assigned to another individual. Such individual shall meet the qualifications required for the responsibilities assigned except that the knowledge requirements may be demonstrated to the operator rather than the Executive Director. Any assignment issued for a period greater than 30 days must be acceptable to the Executive Director.

3. Approved positions, minimum qualifications and responsibilities

(1) Chief Executive Officer (CEO)

(a) Qualifications

The CEO shall not have had any conviction or administrative sanction under the Act or these Regulations which, in the view of the Executive Director, was sufficiently serious to render such person not fit and proper to exercise the responsibilities of such position.

(b) Responsibilities

The CEO shall -

(i) have full authority for all human resources;

(ii) have authority for major financial decisions;

(iii) have direct responsibility for the conduct of the company's affairs; and

(iv) have final responsibility for all safety and security issues.

(2) Person Responsible for Flight Operations (PRFO)

(a) Qualifications

The PRFO shall, as a minimum -

(i) demonstrate adequate knowledge of the operation of the operator's aeroplanes;

(ii) have acceptable oversight experience in a flight operations department or acceptable alternative experience;

(iii) demonstrate knowledge to the Executive Director of the content of the operations manual, the operator's air operator certificate and operations specifications, as well as those provisions of the regulations and technical standards necessary to carry out his or her duties and responsibilities to ensure safety; and

(iv) not have had any conviction or administrative sanction under the Act or these Regulations which, in the view of the Executive Director, was sufficiently serious to render such person not fit and proper to exercise the responsibilities of such position.

(b) Responsibilities

The PRFO is responsible for safe flight operations, in particular -

(i) the control of operations and operational standards of all aeroplanes operated;

(ii) the identification of operations coordination functions which impact on operational control (e.g. maintenance, crew scheduling, load control, equipment scheduling);

(iii) the supervision, organisation, manning and efficiency of the following -

(aa) flight operations;

(bb) cabin safety;

(cc) crew scheduling and rostering; and

(dd) training programmes;

(iv) the timely resolution of safety issues;

(v) the contents of the operator's operations manual;

(vi) the supervision of and the production and amendment of the operations manual;

(vii) liaison with the regulatory authority on all matters concerning flight operations, including any variations to the operator's AOC;

(viii) liaison with any external agencies which may affect the operator's operations;

(ix) ensuring that the operator's operations are conducted in accordance with current regulations, standards and the operator's policy;

(x) ensuring that crew scheduling complies with flight and duty time regulations and that all crew members are kept informed of any changes to the regulations and standards;

(xi) the receipt and actioning of any aeronautical information affecting the safety of flight;

(xii) the dissemination of aeroplane safety information, both internal and external, in conjunction with the safety management system;

(xiii) the qualifications of flight crews;

(xiv) the processing and actioning of any flight crew reports;

(xv) the supervision of flight crews;

(xvi) developing standard operating procedures and/or an aeroplane operating manual;

(xvii) developing and/or implementing all required approved training programmes for the operator's flight crews;

(xviii) issuing directives and notices to the flight crews as required;

(xix) the operational suitability and requirements of all aerodromes and routes served by the operator;

(xx) ensuring the flight documents required by CAR 135.04.1 are retained for the period specified therein; and

(xxi) the maintenance of a current operations library.

(3) Person Responsible for Aircraft (PRA)

(a) Qualifications

The PRA shall, as a minimum -

(i) have or have held an aircraft maintenance engineer (AME) licence, issued in terms of Part 66, or -

(aa) at least have training and experience that may qualify the individual to obtain an AME licence; or

(bb) hold or have held a pilot licence and ratings appropriate to the aeroplanes being operated or demonstrate adequate knowledge of the maintenance of such aeroplanes; or

(cc) hold an engineering degree in aeronautics, electrical, mechanical or avionics or other studies relevant to aircraft maintenance with 5 years' experience in the aviation domain after obtaining that qualification;

(ii) have at least two years' experience in an executive position within aviation, or at least as a Quality Manager within the aviation domain;

(iii) have worked directly with the NCAA for at least one year and have not been the Quality Manager of the assigned maintenance organisation; and

(iv) not have had any conviction or administrative sanction under the Act or these Regulations which, in the view of the Executive Director, was sufficiently serious to render such person not fit and proper to exercise the responsibilities of such position.

(b) Responsibilities

The PRA is responsible for safe aeroplane operations, in particular -

(i) is responsible for all maintenance and inspection personnel;

(ii) ensures that company aircraft are maintained in an airworthy condition;

(iii) ensures that all inspections, repairs and component changes are accomplished in accordance with manufacturer's approved procedures;

(iv) ensures compliance with maintenance procedures, airworthiness directives, service bulletins, service letters and the regulations;

(v) ensures all maintenance technicians are trained and current on the types of aircraft for which approved;

(vi) ensures that all maintenance technicians are certified and supervised according to the requirements specified in the regulations;

(vii) the production and amendment of the policy and procedures manual or maintenance control manual, as appropriate;

(viii) co-ordinates with maintenance contracting agencies when maintenance activities are being performed on company aircraft;

(ix) provides the operations manager with the current airworthiness status of the aircraft and the forecast down times to facilitate maintenance scheduling and insure timely deferral or correction of aircraft discrepancies;

(x) maintains a close liaison with manufacturer's representatives, parts supply houses, repair facilities and the NCAA;

(xi) makes available to maintenance personnel the necessary overhaul manuals, service bulletins, service letters, airworthiness directives, applicable sections of the MCM/MPM and any other required technical data;

(xii) maintains all necessary work records and logbooks, including certification in the aircraft permanent maintenance records that the aircraft is approved for return to service;

(xiii) maintains the mass and balance records for all aircraft; and

(xiv) completes all required reports and submits them to the operations manager for forwarding to the NCAA.

(5) Air Safety Officer (ASO)

(a) Qualifications

The ASO shall, as a minimum, have -

(i) broad operational knowledge in the functions of the organisation or similar type of organisation;

(ii) completed an approved safety management system (SMS) course in accordance with the syllabus prescribed in Technical Standard 135;

(iii) at least 2 years of experience closely involved in the management of an aviation safety programme, SMS or quality assurance programme;

(iv) not have had any conviction or administrative sanction under the Act or these Regulations which, in the view of the Executive Director, was sufficiently serious to render such person not fit and proper to exercise the responsibilities of such position.

(b) Responsibilities

The ASO is responsible for the operator's SMS and in particular -

(i) the establishment and maintenance of a reporting system to ensure the timely collection of information related to potential hazards, incidents and accidents that may adversely affect safety;

(ii) the identification of latent hazards and carry out risk management analyses of those hazards;

(iii) the investigation, analysis and identification of the root cause of all hazards or the contributing factors of incidents and accidents identified under the SMS to ensure the operator has adequate mitigation in place;

(iv) the establishment and maintenance of a safety data system, either by electronic or by other means, to monitor and analyse trends in hazards, incidents and accidents;

(v) the maintenance of a continuous monitoring system that evaluates the results of corrective actions with respect to hazards, incidents and accidents;

(vi) the monitoring of the concerns of the civil aviation industry in respect of safety and their perceived effect on the operator;

(vii) the co-ordination of the organisation's aviation safety programme and all related safety matters;

(viii) co-operation with the training section with regard to safety training of flight, cabin and ground crews, as applicable;

(ix) the supervision of aircraft handling regarding matters related to safety in co-operation with ground support services;

(x) the investigation of all incidents and accidents involving the organisation's aircraft, equipment and property, including ire and emergency procedures, not undertaken in accordance with Part 12;

(xi) the actioning and distribution of accident, incident and other occurrence reports;

(xii) the co-ordination with security personnel to ensure all aspects of security regarding the organisation's aircraft;

(xiii) the development and maintenance of a mandatory occurrence reporting scheme;

(xiv) the establishment of an emergency plan in the event of an accident, which includes the actions to be followed by relevant personnel;

(xv) in concert with the person responsible for quality, the maintenance of a quality assurance programme within the organisation; and

(xvi) the realisation of other duties which include -

(aa) promulgation of flight safety bulletins to all staff within the organisation;

(bb) conducting meetings with all relevant personnel regarding safety matters;

(cc) maintenance of safety equipment;

(dd) safety audits; and

(ee) occupational health and safety.

(6) Quality Manager (QM)

(a) Qualifications

The QM shall, as a minimum, have -

(i) Grade 12 school level (NSSC), NQF Level 4, or equivalent qualification;

(ii) certificate/s or diploma in quality management; and

(iii) at least 5 years' experience in implementation and maintenance of QM systems.

(iv) not have had any conviction or administrative sanction under the Act or these Regulations which, in the view of the Executive Director, was sufficiently serious to render such person not fit and proper to exercise the responsibilities of such position.

(b) Responsibilities

The QM is responsible for ensuring that the operator's quality assurance programme is properly established, implemented and maintained and in particular -

(i) the monitoring of compliance with, and the adequacy of, the procedures required to ensure safe operational practices and airworthy aircraft;

(ii) the monitoring of activity in flight operations, maintenance, crew training and ground operations, to ensure that the standards required by the Executive Director, and any additional requirements defined by the operator, are being met; and

(iii) any additional tasks that may be assigned with respect to the financial and non-operational efficiency aspects of the company.

(7) Security Manager (SM)

(a) Qualifications

The SM shall, as a minimum, have -

(i) broad operational knowledge in the functions of the organisation or similar type of organisation;

(ii) completed an approved aviation security course or other course related to aviation security; and

(iii) at least 2 years of experience closely involved in the field of security.

(iv) not have had any conviction or administrative sanction under the Act or these Regulations which, in the view of the Executive Director, was sufficiently serious to render such person not fit and proper to exercise the responsibilities of such position.

(b) Responsibilities

The SM is responsible for ensuring that the operator's security programme is properly established, implemented and maintained and in particular -

(i) the monitoring of compliance with, and the adequacy of, the procedures established to ensure the security of the operator's facilities, aircraft and personnel through an inspection/audit programme;

(ii) the provision of training in all matters related to security either directly or through the operator's training department;

(iii) the identification of threats to aviation security, notification to the appropriate authority of such threats and the development of countermeasures to combat those threats, if applicable; and

(iv) liaising with aerodrome security personnel and other law enforcement authorities with respect to security matters.

135.06.3 APPLICATION, CONSIDERATION OF AND ISSUE OF AN AIR OPERATOR CERTIFICATE OR OPERATIONS SPECIFICATIONS

1. Document format and layout

All Namibia air operator certificates (AOCs) and associated operations specifications (OpSpecs) shall be in the form and layout prescribed by Appendix 6, to Annex 6, Part I of the ICAO Annexes.

2. Contents of an air operator certificate

Each AOC shall contain at least the following information -

(a) the State of the Operator and the issuing authority;

(b) the AOC number and its expiration or valid to date or other means to indicate its validity;

(c) the operator's name, trading name (if different) and address of the principal place of business;

(d) the date of issue and the name, signature and title of the authority's representative; and

(e) the location, in a controlled document carried on board, where the contact details of operational management can be found.

Note - *For the purposes of establishing a controlled document to provide the information required by sub-paragraph (e) an operator's operations manual is considered as the means of compliance: Provided the information is contained in a part of the operations manual required to be carried on board the operator's aeroplanes at all times*.

3. Contents of an OpSpec

OpSpecs are issued in different parts and contain the following information as applicable to the authority being granted by the OpSpec -

(a) telephone number;

(b) AOC number;

(c) business name of the operator including "doing business as" (dba), where applicable;

(d) date of issue of the OpSpec;

(e) aeroplane makes, types and models to which the specification applies;

(f) areas and types of operations approved; and

(g) special limitations, authorisations and approvals.

Note - *For more information with respect to the AOCs or associated OpSpecs an operator/applicant should contact the Flight Operations Section of the Namibia Civil Aviation Authority*.

135.06.5 SAFETY AND SECURITY INSPECTIONS AND AUDITS

1. Findings of non-compliance as follows:

(1) NCAA for oversight in accordance with TS shall have a system to analyse findings for their safety significance.

(2) A level 1 finding shall be issued by the Authority when any significant noncompliance is detected with the applicable requirements of Civil Aviation Act, 2016, NAM-CARS and NAM-CATS, with the organisation's procedures and manuals or with the terms of an approval, certificate, specialised operation authorisation or with the content of a declaration which lowers safety or seriously hazards flight safety or security.

(a) The level 1 findings shall include:

(i) failure to give the Authority access to the facilities of the organisation during normal operating hours and after two written requests;

(ii) obtaining or maintaining the validity of the organisation certificate or specialised operations authorisation by falsification of submitted documentary evidence;

(iii) evidence of malpractice or fraudulent use of the organisation certificate or specialised operations authorisation; and

(iv) the lack of an accountable manager.

(3) A level 2 finding shall be issued by the Authority when any non-compliance is detected with the applicable requirements of NAMCARS and NAMCATS, with the organisation's procedures and manuals or with the terms of an approval, certificate, specialised operation authorisation or with the content of a declaration which could lower safety or hazard flight safety or security.

(4) A level 3 finding shall be issued by the Authority when a non-compliance or finding is identified which may not necessarily lower safety or hazard flight safety or security on its own. It is the responsibility of the approval holder to rectify and shall not necessitate a follow-up inspection. The approval holder is required to notify the Authority when rectification has been effected. These findings are normally administrative in nature. Generally, a response containing corrective actions shall be received within 14 working days and no later.

(5) An observation shall be issued by the Authority when a practice or condition that indicates a trend that could lead to a future non-compliance is identified. It is highly recommended that an operator shall respond to the observation.

(6) When a finding is detected during oversight or by any other means, the Authority shall, without prejudice to any additional action required by NAMCARS and NAMCATS, communicate the finding to the organisation in writing and request corrective action to address the non-compliance(s) identified. Where relevant, the Authority shall inform the State in which the aircraft is registered.

(a) In the case of level 1 findings, the Authority shall take immediate and appropriate action to prohibit or limit activities, and if appropriate, it shall take action to revoke the certificate, specialised operations authorisation or specific approval or to limit or suspend it in whole or in part, depending upon the extent of the level 1 finding, until successful corrective action has been taken by the organisation.

(b) In the case of level 2 findings, the Authority shall:

(i) grant the organisation a corrective action implementation period appropriate to the nature of the finding that in any case initially shall not be more than three months. At the end of this period, and subject to the nature of the finding, the competent authority may extend the three-month period subject to a satisfactory corrective action plan agreed by the A authority; and

(ii) assess the corrective action and implementation plan proposed by the organisation and, if the assessment concludes that they are sufficient to address the noncompliance(s), accept these.

(c) Where an organisation fails to submit an acceptable corrective action plan, or to perform the corrective action within the time period accepted or extended by the competent authority, the finding shall be raised to a level 1 finding and action taken as laid down in (4)(1).

(d) The Authority shall record all findings it has raised or that have been communicated to it in accordance with point (e) and, where applicable, the enforcement measures it has applied, as well as all corrective actions and date of action closure for findings.

(7) Without prejudice to any additional enforcement measures, when the Authority identifies any non-compliance with the applicable requirements of its Regulations and its Standards by an organisation certified by, or authorised by or declaring its activity to the authority of another Member State, it shall inform that competent authority of that State and provide an indication of the level of finding.

135.06.9 DEMONSTRATION FLIGHTS FOR INITIAL APPLICATION

(1) At least one successful demonstration flight shall be accomplished over a route typically operated by the operator in the following circumstances -

(a) for applicants seeking an air operator certificate (AOC), prior to conducting commercial operations; and

(b) for existing AOC-holders operating propeller-driven aeroplanes, prior to the introduction of a turbojet or turbofan aeroplane.

(2) The demonstration flight for an applicant seeking an AOC shall be accomplished using the aeroplane designated by the Executive Director.

(3) A demonstration flight may be required in the event an aeroplane type is added to an existing AOC.

Notes -

1. Normally, the demonstration flight(s) will be accomplished using the most complex type of aeroplane having the greatest maximum certificated mass to be operated unless the Executive Director determines that, due to the size and complexity of the proposed operations, additional demonstrations are required using other aeroplane types.

2. For the purposes of this TS, the complexity of the aeroplane is based on its method of propulsion, with the first named aeroplane being the least complex -

(a) reciprocating engine aeroplanes;

(b) turbo-propeller aeroplanes; and

(c) turbojet or turbofan aeroplanes.

135.07.2 APPLICATION FOR FOREIGN AIR OPERATOR PERMIT OR AMENDMENT OF FOREIGN AIR OPERATOR PERMIT

1. Foreign Operator Permit application form

The form referred to in CAR 127.07.2, in which application must be made for the issuing of a foreign air operator permit, or an amendment thereof, is found on NCAA website under Forms and Applications.

135.07.3 ASSESSMENT OF APPLICATION AND ISSUE OF PERMIT

1. Foreign Operator Permit form

The form referred to in CAR 127.07.3(4), on which a foreign air operator permit is issued, is found on NCAA website under Forms and Applications.

135.07.7 RENEWAL OF PERMIT

1. Application form for renewal of FOP

The form in which an application for the renewal of a foreign air operator permit must be made, is found on NCAA website under Forms and Applications.

135.08.1 ROUTES AND AREAS OF OPERATION AND AERODROME FACILITIES

1. Destination Alternate Aerodrome Planning Minima

(1) Except as provided in paragraph (2), an operator shall meet the applicable planning minima specified in the following table in order to select an aerodrome as a destination alternate, when required -

Approach and landing	Ceiling	Visibility conditions provisions
Aerodromes supporting instrument approach and landing operations, but not supporting straight-in approach and landing operations to at least two runway ends.	Applicable aerodrome operating minima plus an increment of 400ft	Applicable aerodrome operating minima plus an increment of 1 500m
Aerodromes supporting a straight-in instrument approach	Applicable aerodrome operating minima plus an increment of 200ft	Applicable aerodrome operating minima plus an increment of 800m

and landing operation to different suitable runways.		
Aerodromes supporting a minimum of two instrument approach and landing operations to different suitable runways, at least one shall be CAT II or III.	For CAT II operations at east 300ft For CAT III operations at least 200ft	For CAT II operations, a prevailing visibility corresponding to at least an RVR of 1 200m For CAT III operations, a prevailing visibility corresponding to at least an RVR of 550m

Note - *The term "different suitable runways" may denote either two or more separate runways or a single runway with a straight-in instrument approach and landing procedure to each end of the runway*.

(2) The criteria specified in paragraph (1) need not be complied with: Provided alternative selection criteria are submitted by the operator that are developed as a result of a safety risk assessment, based on the operator's SMS programme, which provide a level of safety equivalent to that in paragraph (1) and are approved by the Executive Director.

2. EDTO authorisation and requirements for operations beyond 180 minutes

2.1. General

(1) An air service operator shall not operate an EDTO flight unless authorised to do so on its Ops spec by means of a specific approval issued by the Executive Director, which considers EDTO maintenance and operational requirements.

(2) An air service operator wishing to conduct an EDTO operation shall apply to the Executive Director for a specific approval at least 90 days prior to the operational departure date.

(3) This technical standard establishes EDTO requirements for –

(a) two-engine aeroplanes operated along a planned route which contains a point further than 180 minutes flying time from an adequate airport at an approved one-engine inoperative cruise speed under standard conditions in still air.

(b) aeroplanes with more than two engines operated along a planned route which contains a point further than 180 minutes flying time from an adequate airport at an approved all engine operating cruise speed under standard conditions in still air.

(4) Aeroplanes with more than two engines shall have undergone a manufacturer's review of the time capabilities of the relevant EDTO time limited systems (TLSs) to determine whether:

(a) these time limitations have to be considered for the dispatch of EDTO flights; and

(b) the corresponding time limitation should be provided for in relevant aircraft documentation.

(5) To conduct EDTO. the specified aircraft-engine combination must be certificated to the airworthiness standards for transport-category aircraft and each aircraft shall be approved for EDTO by the Executive Director.

(6) When requesting any route. for the initial EDTO Approval, an air service operator shall demonstrate that:

(a) it is able to satisfactorily conduct operations between each required airport as defined for that route or route segment. and any required enroute alternate airport; and

(b) he facilities and services specified in the applicable Part of these regulations are available and adequate for the proposed operation.

2.2. Requirements applicable to aeroplanes flown in EDTO operations

(a) All aeroplanes, regardless of the number of engines, needs a viable diversion airport in the case of an onboard fire. medical emergency or catastrophic decompression.

(b) An air service operator shall ensure:

(i) availability of enroute alternate airports;

(ii) adequate firefighting coverage at these airports;

(iii) fuel planning to account for depressurization; and

(iv) that planning for the maximum allowable diversion and worst-case scenarios account for all aircraft time-critical systems.

2.3. Operations by aeroplanes with turbine engines for operations beyond 180 minutes to an enroute alternate aerodrome

2.3.1. General

(1) All provisions for operations by an aeroplane with turbine engines beyond 180 minutes to an enroute alternate aerodrome applies to extended diversion time operations (EDTO).

(2) In applying these EDTO requirements for an aeroplane with turbine engines:

(a) operational control procedures shall be contained in the operations manual;

(b) flight dispatch procedures refer to the method of control and supervision of flight operations. This does not imply a specific requirement for licensed flight dispatcher or a full flight following system;

(c) operating procedures refer to the specification of organisation and methods established to exercise operational control and flight dispatch procedures in the appropriate manual(s). These procedures should cover at least a description of responsibilities concerning the initiation, continuation, termination or diversion of each flight as well as the method of control and supervision of flight operations.

2.3.2. Requirements to be used when converting diversion times to distances

(1) An approved one-engine-inoperative (OEI) speed or approved all-engine operative (AEO) speed is any speed within the certified flight envelope of the aeroplane.

(2) Determination of the 180-minute distance – aeroplanes with two turbine engines.

For determining whether a point on the route is beyond 180 minutes to an enroute alternate, an air service operator should select an approved OEI speed. The distance is calculated from the point of the diversion followed by cruise for 180 minutes, in ISA and still-air conditions. For the purposes of computing distances, credit for drift down may be applied.

(3) Determination of the 180-minute distance – aeroplanes with more than two turbine engines.

(a) For determining whether a point on the route is beyond 180 minutes to an en-route alternate, an air service operator shall select an approved AEO speed. The distance is calculated from the point of the diversion followed by cruise for 180 minutes, in ISA and still-air conditions.

2.3.3. Training

(1) An air service operator shall ensure that prior to conducting EDTO, each pilot, flight operations officer and despatcher has completed EDTO training in accordance with a syllabus approved by the Executive Director and detailed in the appropriate manual. Training programmes shall contain as a minimum:

(a) route qualification;

(b) flight preparation;

(c) concept of extended diversion time operations;

(d) criteria for diversions; and

(e) requirements for initial and recurrent training.

2.3.4. Flight dispatch and operational requirements

(1) Flight dispatch requirements contained in the applicable manual should ensure the following-

(a) identification of enroute alternate aerodromes;

(b) prior to departure and during flight. that the flight crew is provided with the most up-to-date information on the identified en-route alternate aerodromes, including operational status and meteorological conditions;

(c) methods to enable two-way communications between an aeroplane and the operator's operational control centre;

(d) that the air service operator has a means to monitor conditions along the planned route including the identified alternate aerodromes and that procedures are in place so that the flight crew are advised of any situation that may affect the safety of flight;

(e) that the intended route does not exceed the established aeroplane threshold time unless the air service operator is approved for EDTO operations;

(f) pre-flight system serviceability checking including the status of items in the minimum equipment list:

(g) communication and navigation facilities and capabilities;

(h) fuel requirements;

(i) availability of relevant performance information for the identified enroute alternate aerodrome{s); and

(j) systems degradation and reduced flight altitude.

(2) In addition, operations conducted by an aeroplane with two turbine engines, the air service operator shall ensure that –

(a) prior to departure and in flight, the meteorological conditions at identified enroute alternate aerodromes shall be at or above the aerodrome operating minima required for the operation during the estimated time of use.

(b) enroute alternate aerodromes, as required in (a) above for EDTO by aeroplanes with two turbine engines, shall be selected and specified in the operational and air traffic services (ATS) flight plans.

2.3.5. En-Route alternate aerodromes

(1) The PIC shall ensure that aerodromes to which an aeroplane may proceed in the event that a diversion becomes necessary while enroute:

(a) are identified and operational:

(b) the necessary services and facilities available; and

(c) aeroplane performance requirements can be met.

(2) En-route alternate aerodromes may also be the take-off or destination aerodromes.

2.4. EDTO requirements for aeroplanes with two or more turbine engines

2.4.1. In addition to section 3, this section addressed the provisions that apply to operations by an aeroplane with two or more turbine engines where the diversion time to an enroute alternate aerodrome is greater than the established threshold time.

2.4.2. EDTO significant systems

(1) EDTO significant systems may be the aeroplanes propulsion system and any other aeroplane systems whose failure or malfunctioning could adversely affect safety particular to an EDTO flight, or whose functioning is specifically important to continued safe flight and landing during an aeroplane EDTO diversion.

(2) An air service operator shall ensure that the redundancy level and reliability of the aeroplane systems are adequate to support the safe conduct of EDTO.

(3) The maximum diversion time shall not exceed the value of the EDTO significant system limitation, if any, for extended diversion time operations identified in an aeroplane flight manual, directly or by reference, reduced by an operational safety margin of 15 minutes.

(4) The specific safety risk assessment required from the air service operator to approve operations beyond the time limits of an EDTO significant time limited system should be in accordance with provisions as prescribed in Part 140 and shall consider at least the following:

(a) the capabilities of such air service operator in so far as they relate to the operator's quantifiable in-service experience, compliance record, aeroplane capability and overall operational reliability that:

(i) are sufficient to support operations beyond the time limits of an EDTO significant time-limited system;

(ii) demonstrates the ability of the air service operator to monitor and respond to changes in a timely manner; and

(iii) the air service operator's established processes, necessary for successful and reliable extended diversion time operations, can be successfully applied to such operations.

(b) For the purposes of sub-section (2), overall reliability of the aeroplane refers to:

(i) quantifiable standards of reliability taking into account the number of engines, aircraft EDTO significant systems and any other factors that may affect operations beyond the time limits of a particular EDTO significant time-limited system; and

(ii) relevant data from the aeroplane manufacturer and data from an operator reliability programme used as a basis to determine overall reliability of the aeroplane and its EDTO significant systems;

(iii) for the purposes of sub-paragraph (ii), relevant information from the aeroplane manufacturer refers to technical data and characteristics of the aeroplane and worldwide fleet operational data provided by the manufacturer and used as a basis to determine overall reliability of the aeroplane and its EDTO significant systems.

(c) for the purposes of sub-section (2), reliability of each time-limited system refers to quantifiable standards of design, testing and monitoring that ensure the reliability of each particular EDTO significant time-limited system;

(d) specific mitigation measures refer to the safety risk management mitigation strategies implemented in terms of the safety risk assessment, which have documented manufacturer concurrence, that ensure an equivalent level of safety is maintained. These specific mitigations shall be based on:

(i) technical expertise such as data or evidence, proving the operator's eligibility for an approval of operations beyond the time limit of the relevant EDTO significant system; and

(ii) an assessment of relevant hazards, their probability and the severity of the consequences that may adversely impact the safety of the operation of an aeroplane operated beyond the limit of a particular EDTO significant time-limited system.

2.4.3. Threshold time and maximum diversion time

In considering an EDTO approval, the Executive Director shall consider that –

(a) the establishment threshold time is not an operating limit. It is a flight time to an enroute alternate aerodrome, which is established as being the EDTO threshold beyond which particular consideration should be given to the aeroplane capability as well as the operator's relevant operational experience;

(b) the approved maximum diversion time shall take into consideration the most limiting EDTO significant system time limitation, if any, indicated in the aeroplane flight manual (directly or by reference) for a particular aeroplane type and the operator's operational and EDTO experience, if any, with an aeroplane type or, if relevant, with another aeroplane type or model.

2.5. EDTO for aeroplanes with more than two turbine engines

2.5.1. In addition to the provisions in section 2.2, this section addresses the provisions that apply in particular to aeroplanes with more than two turbine engines.

2.5.2. Operational and diversion planning principles

When planning or conducting an EDTO, an air service operator and the PIC shall ensure that –

(a) the MEL, the communications and navigation facilities, fuel and oil supply, enroute alternate aerodromes and aeroplane performance are appropriately considered;

(b) if no more than one engine is shut down, a PIC may elect to continue beyond the nearest enroute alternate aerodrome (in terms of time) if a PIC determines that it is safe to do so. In making this decision, a PIC shall consider all relevant factors; and

(c) in the event of a single or multiple failure of an EDTO significant system or systems (excluding engine failure), the aircraft can proceed to and land at the nearest available enroute alternate aerodrome where a safe landing can be made unless it has been determined that no substantial degradation of safety will result from any decision made to continue the planned flight.

2.5.3. EDTO critical fuel

(1) An aeroplane with more than two engines engaged in EDTO operations shall carry enough fuel to fly to an enroute alternate aerodrome. This EDTO critical fuel should correspond to the additional fuel that may be required to comply with Part 135.

(2) The following shall be considered, using the anticipated mass of an aeroplane, in determining the corresponding EDTO critical fuel:

(a) fuel sufficient to fly to an enroute alternate aerodrome, considering at the most critical point of the route, simultaneous engine failure and depressurization or depressurization alone, whichever is more limiting;

NOTE: the speed selected for the diversions be it depressurization, combined or not with an engine failure, may be different from the approved AEO speed used to determine the EDTO threshold and maximum diversion distance.

(b) fuel to account for icing;

(c) fuel to account for errors in wind forecasting;

(d) fuel to account for holding an instrument approach and landing at the enroute alternate aerodrome;

(e) fuel to account for deterioration in cruise fuel-burn performance; and

(f) fuel to account for APU use (if required).

(3) The following factors may be considered in determining if a landing at a given aerodrome is the more appropriate course of action:

(a) aeroplane configuration, mass, systems status and fuel remaining;

(b) wind and weather conditions enroute at the diversion altitude, minimum altitudes enroute and fuel consumption to the en-route alternate aerodrome;

(c) runways available, runway surface condition and weather, wind and terrain in the proximity of the enroute alternate aerodrome;

(d) instrument approaches and approach/runway lighting available and rescue and fire fighting services (RFFS) at the enroute alternate aerodrome;

(e) the pilot's familiarity with that aerodrome and information about hat aerodrome provided to a pilot by an operator; and

(f) facilities for passenger and crew disembarkation and accommodation.

2.5.4. Threshold time

(1) In establishing the appropriate threshold time and to maintain the required level of safety, the Executive Director shall consider that –

(a) the airworthiness certification of the aeroplane type does not restrict operations beyond the threshold time, taking into account the aeroplane system design and reliability aspects;

(b) specific flight dispatch requirements are met;

(c) necessary in-flight operational procedures are established; and

(d) the operator's previous experience and operating record on similar aircraft types and routes is satisfactory.

(2) For determining whether a point on a route is beyond the EDTO threshold to an enroute alternate aerodrome, an operator shall use the approved speed as described in this subpart.

2.5.5. Maximum diversion time

(1) In approving the maximum diversion time, the Executive Director will consider the aeroplanes EDTO significant systems (e.g. limiting time limitations, if any, and relevant to that particular operation) for:

(a) a particular aeroplane type; and

(b) the air service operators operational and EDTO experience with the aeroplane type; or

(c) if relevant, with another aeroplane type or model.

(2) An air service operator's approved maximum diversion time should not exceed the most limiting EDTO significant system time limitation identified in the aeroplane flight manual, reduced by an operational safety margin of 15 minutes.

(3) For determining the maximum diversion distance to an enroute alternate the approved speed as described in this technical standard shall be used.

2.5.6. EDTO significant systems

(1) In addition to the provisions in section 4, this section addresses particular provisions for an aeroplane with more than two turbine engines.

(2) Consideration of time limitations:

(a) For operations beyond the EDTO threshold, an operator shall consider. at time of dispatch and as outlined below, the most limiting EDTO significant system time limitation, if any, indicated in the aeroplane flight manual {directly or by reference) and relevant to that particular operation.

(b) An operator shall check that from any point on the route, the maximum diversion time does not exceed the most limiting EDTO significant system time limitation, reduced by an operational safety margin of 15 minutes.

(c) The maximum diversion time subject to cargo fire suppression time limitations are considered part of the most limiting EDTO significant time limitations.

(d) For that purpose, an operator shall consider the approved speed as described in this technical standard or consider adjusting that speed with forecast wind and temperature conditions for operations with threshold times beyond 180 minutes.

2.5.7. En-route alternate aerodromes

In addition to the enroute alternate aerodrome provisions prescribed elsewhere in these technical standards, the following shall apply:

(a) for route planning purposes, identified enroute alternate aerodromes, which may be used if necessary, needs to be located at a distance within the maximum diversion time from the route;

(b) in extended diversion time operations, before an aeroplane crosses its threshold time during flight. the conditions at the en-route alternate aerodrome within the approved maximum diversion time will be at or above the operator's established aerodrome operating minima for the operation during the estimated time of use;

(c) if any conditions, such as weather below landing minima, are identified that would preclude a safe approach and landing at that aerodrome during the estimated time of use, an alternative course of action shall be determined such as selecting another enroute alternate aerodrome within an operator's approved maximum diversion time; and

(d) En-route alternate aerodromes may also be the take-off and destination aerodromes.

2.5.8. Operational approval procedure

(1) In approving an operator with a particular aeroplane type for extended diversion time operations, the appropriate threshold time and maximum diversion time should be established and, in addition to the requirements previously set forth in this technical standard, the Executive Director shall ensure that:

(a) the air service operator's past experience and compliance record is satisfactory and an air service operator has established the processes necessary for successful and reliable extended diversion time operations and shown that such processes can be successfully applied throughout such operations;

(b) an operator's procedures are acceptable based on certified aeroplane capability and adequate to address continued safe operation in the event of degraded aeroplane systems;

(c) the air service operator's crew training programme is adequate for the proposed operation;

(d) documentation accompanying the authorization covers all relevant aspects;

(e) it has been shown (e.g. during the EDTO certification of the aeroplane) that the flight can continue to a safe landing under the anticipated degraded operating conditions which would arise from the most limiting EDTO significant system time limitation, if any, for extended diversion time operations is identified in the aeroplane flight manual, directly or by reference; and

(f) any other condition which the State of the Operator considers to be equivalent in airworthiness and performance risk.

2.5.9. Conditions for converting diversion times to distance in determining the geographical area beyond threshold and within maximum diversion distances

(1) An approved AEO speed is any all-engines-operative speed within the certified flight envelope of an aeroplane.

(2) An air service operator. when applying for an EDTO specific approval, shall identify. for the Executive Director's approval, the AEO speed considering ISA and still-air conditions used to calculate the threshold and maximum diversion distances.

NOTE: the speed used to calculate the maximum diversion distance may be different from the speed used to determine the 180 minute and EDTO thresholds.

(3) For determining whether a point on the route is beyond the EDTO threshold to an enroute alternate, an air service operator shall:

(a) use the approved speed as provided in this technical standard; and

(b) calculate the distance from the point of the diversion followed by the cruise for the determined threshold time.

(4) For determining the maximum diversion time distance to an enroute alternate, an air service operator shall use:

(a) the approved speed as prescribed in this technical standard;

(b) the distance calculated from the point of the diversion followed by the cruise for the approved maximum diversion time.

2.5.10.

(1) For an aeroplane with more than two engines, there are no additional EDTO airworthiness certification requirements. This means that the configuration and maintenance standards defined through the basic type certification of such an aeroplane are considered as adequate for EDTO operations.

(2) Nevertheless, a review of the TLS, if any, on aeroplanes with more than two engines should be performed by the aircraft manufacturer. The objective of this review is to confirm whether these time limitations have to be considered for the dispatch of EDTO flights and if the corresponding time limitation should be provided in relevant aircraft documentation.

(3) As in subparagraph (1), there are no additional EDTO maintenance procedures or maintenance programme requirements for aeroplanes with more than two engines. Notwithstanding that ICAO Standards do not

require EDTO certification for aeroplanes with more than two engines, where a State has implemented standards for EDTO certification of these aeroplanes, the following should be considered:

(a) existing ETOPS certifications granted prior to the implementation of the new EDTO Standards in the regulations and these technical standards remain valid and do not require recertification for EDTO;

(b) the EDTO certification is reflected by the issuance of an EDTO CMP document. The EDTO CMP document gathers the required configuration standards and maintenance tasks, and as applicable, the flight crew procedures and dispatch standards. For EDTO operations, the aircraft should be configured, maintained and operated according to the EDTO CMP document requirements; and

(c) the EDTO CMP document is approved by the State of Design. It is issued for the initial EDTO certification. It may be revised to reflect the conclusions of the in-service experience review (reliability surveillance performed by the State of Design) through the airworthiness directive process.

(4) The most limiting EDTO significant system time limitation, if any, must be indicated in the aircraft flight manual (directly or by reference) and relevant to that particular operation.

2.5.11. Maintaining operational approval

In order to maintain the required level of safety on routes where an aeroplane is permitted to operate beyond the establishment threshold time, an air service operator shall ensure that:

(a) specific flight dispatch requirements are met;

(b) in-flight operational procedures are established; and

(c) specific operational approval is granted by the Executive Director.

2.6. EDTO for an aeroplane with two turbine engines

2.6.1. General

(1) In addition to the provisions in sections 2.2 and 2.5, this section addresses the provisions that apply in particular to an aeroplane with two turbine engines.

(2) EDTO provisions for aeroplanes with two turbine engines do not differ from the previous provisions for extended range operations by aeroplanes with two turbine engines (ETOPS). Therefore, EDTO may be referred to as ETOPS in some documents.

2.6.2. Operational and diversion planning principles

2.6.2.1. When planning or conducting EDTO, the air service operator and the PIC shall ensure that:

(a) the minimum equipment list. the communications and navigation facilities, fuel and oil supply, enroute alternate aerodromes and aeroplane performance are appropriately considered;

(b) in the event of an aeroplane engine shutdown, an aeroplane can proceed to and land at the nearest enroute alternate aerodrome, in terms of the least flying time, where a safe landing can be made; and

(c) in the event of a single or multiple failure of an EDTO significant system or systems (excluding engine failure). the aeroplane can proceed to and land at the nearest available enroute alternate aerodrome where a safe landing can be made unless it has been determined that no substantial degradation of safety will result from any decision made to continue the planned flight.

2.6.2.2. EDTO critical fuel

(1) The PIC of an aeroplane with two engines engaged in EDTO operations shall ensure that sufficient fuel is carried to fly to an en-route alternate aerodrome. This EDTO critical fuel corresponds to the additional fuel that may be required.

(2) The following shall be considered. using the anticipated mass of the aeroplane. in determining the corresponding EDTO critical fuel:

(a) fuel sufficient to fly to an enroute alternate aerodrome, considering at the most critical point of the route, failure of one engine or simultaneous engine failure and depressurization or depressurization alone. whichever is more limiting:

(i) the speed selected for the all-engines-operative diversion which may be depressurization alone. may be different from the approved OEI speed used to determine the EDTO threshold and maximum diversion distance;

(ii) the speed selected for the OEI diversions. which may be engine failure alone or combined engine failure and depressurization. shall be the approved OEI speed used to determine the EDTO threshold and maximum diversion distance.

(b) fuel to account for icing;

(c) fuel to account for errors in wind forecasting;

(d) fuel to account for holding an instrument approach and landing at the en-route alternate aerodrome;

(e) fuel to account for deterioration in cruise fuel-burn performance; and

(f) fuel to account for APU use (if required).

2.6.2.3. The following factors shall be considered by a PIC in determining if a landing at a given aerodrome is the more appropriate course of action:

(1) Aeroplane configuration. mass. systems status and fuel remaining;

(2) Wind and weather conditions enroute at the diversion altitude, minimum altitudes enroute and fuel consumption to the enroute alternate aerodrome;

(3) Runways available, runway surface condition and weather, wind and terrain in the proximity of the enroute alternate aerodrome;

(4) Instrument approaches and approach/runway lighting available and rescue and fire fighting services (RFFS) at the enroute alternate aerodrome;

(5) Familiarity with that aerodrome and information about that aerodrome provided to the pilot by the operator; and

(6) Facilities for passenger and crew disembarkation and accommodation.

2.6.2.4. Threshold time

(1) In establishing the appropriate threshold time and to maintain the required level of safety, the Executive Director shall consider:

(a) an airworthiness certification of the aeroplane type specifically permits operations beyond the threshold time, taking into account the aeroplane system design and reliability aspects;

(b) a reliability of the propulsion system is such that the risk of double engine failure from independent causes is extremely remote;

(c) any necessary special maintenance requirements are fulfilled;

(d) specific flight dispatch requirements are met;

(e) necessary in-flight operational procedures are established; and

(f) the operator's previous experience on similar aircraft types and routes is satisfactory.

(2) For determining whether a point on a route is beyond the EDTO threshold to an enroute alternate aerodrome, an operator shall use the approved speed as described in this technical standard.

2.6.2.5. Maximum diversion time

(1) In approving the maximum diversion time. the Executive Director shall consider the EDTO certified capability of an aeroplane. the aeroplane's EDTO significant systems for example limiting time limitation, if any, and relevant to that particular operation) for a particular aeroplane type and the operator's operational and EDTO experience with the aeroplane type or. if relevant. with another aeroplane type or model.

(2) For determining the maximum diversion distance to an enroute alternate, an operator shall use the approved speed as described in this technical standard.

(3) An air service operator's approved maximum diversion time shall not exceed the EDTO certified capability of the aeroplane or the most limiting EDTO significant system time limitation identified in the aeroplane flight manual, reduced by an operational safety margin of 15 minutes.

2.7. EDTO significant systems

In addition to the provisions of section 2.2, this section addresses particular provisions for an aeroplane with two turbine engines.

2.7.1. The reliability of the propulsion system for the aeroplane/engine combination being certified is such that the risk of double engine failure from independent causes shall be assessed and found acceptable to support the diversion time being approved by the Executive Director.

2.7.2. Consideration of time limitations

(1) For all operations beyond the EDTO threshold, as determined by the Executive Director, an air service operator should consider, at time of dispatch and as outlined below, the EDTO certified capability of the aeroplane and the most limiting EDTO significant system time limitation. if any, indicated in the AFM (directly or by reference) and relevant to that particular operation.

(2) An air service operator shall check that from any point on the route, the maximum diversion time at the approved speed as described in this

technical standard does not exceed the most limiting EDTO significant system time limitation, other than the cargo fire suppression system. reduced by an operational safety margin, of not less than 15 minutes.

(3) The air service operator shall check that from any point on the route, the maximum diversion time at all-engines operating cruise speed, considering ISA and still-air conditions. does not exceed the cargo fire suppression system time limitation, reduced by an operational safety margin, of not less than 15 minutes.

(4) The air service operator shall consider the approved speed as described in this technical standard or consider adjusting that speed with forecast wind and temperature conditions for operations with threshold times beyond 180 minutes.

2.7.3. Enroute alternate aerodromes

(1) In addition to the enroute alternate aerodrome provisions described in this technical standard, the air service operator and the PIC shall apply the following:

(a) for route planning purposes, identified enroute alternate aerodromes, which may be used if necessary, need to be located at a distance within the maximum diversion time from the route;

(b) during EDTO, before an aeroplane crosses its threshold time during flight, an enroute alternate aerodrome shall be nominated within the approved maximum diversion time whose conditions shall be at or above the air service operator's established aerodrome operating minima for the operation during the estimated time of use;

(c) if any conditions, such as weather below landing minima, are identified that would preclude a safe approach and landing at that aerodrome during the estimated time of use, an alternative course of action shall be determined such as selecting another enroute alternate aerodrome within the operator's approved maximum diversion time.

(2) During flight preparation and throughout the flight the air service operator shall provide the means to the flight crew to obtain the most up-to-date information on the identified enroute alternate aerodromes, including operational status and meteorological conditions.

(3) En-route alternate aerodromes may also be the take-off or destination aerodromes.

2.7.4. Operational approval procedure

(1) The Executive Director shall establish an appropriate threshold time and in addition to approving a maximum diversion time for an air service operator, the Executive Director shall ensure that the air service operator has:

(a) a satisfactory compliance record and past experience;

(b) established the processes necessary for successful and reliable extended diversion time operations and shown that such processes can be successfully applied throughout such operations;

(c) procedures that are acceptable based on certified aeroplane capability and adequate to address continued safe operation in the event of degraded aeroplane systems;

(d) a crew training programme that is adequate for the proposed operation;

(e) documentation accompanying the authorization application that covers all relevant aspects; and

(f) shown (e.g. during the EDTO certification of the aeroplane) that the flight can continue to a safe landing under the anticipated degraded operating conditions which could arise from:

(i) the most limiting EDTO significant system time limitation, if any, for extended diversion time operations identified in the aeroplane flight manual, directly or by reference;

(ii) total loss of engine-generated electric power;

(iii) total loss of thrust from one engine; or

(iv) any other condition which the Executive Director considers to be equivalent in airworthiness and performance risk.

2.7.5. Conditions to be used by an air service operator when converting diversion times to distances for the determination of the geographical area beyond threshold and within maximum diversion distances

(1) For the purpose of this technical standard, an approved OEI speed is any one-engine-inoperative speed within the certified flight envelope of an aeroplane.

(2) EDTO OEI speed

(a) when applying for EDTO. the air service operator should identify, and the Executive Director shall approve, the OEI speed(s). considering ISA and still-air conditions. that will be used to calculate the threshold and maximum diversion distances; and

(b) the air service operator shall ensure that the identified speed that will be used to calculate the maximum diversion distance shall be the same one used to determine fuel reserves for OEI diversions.

(3) Determination of the EDTO threshold

(a) for determining whether a point on the route is beyond the EDTO threshold to an enroute alternate. the air service operator shall use the approved speeds as described in this technical standard.

(b) the distance is calculated from the point of the diversion followed by the cruise for the determined threshold time.

(c) for the purposes of computing distances, credit for drift-down may be taken.

(4) Determination of the maximum diversion time distance

(a) for determining the maximum diversion time distance to an en-route alternate, the air service operator shall use the approved speed as described in this technical standard.

(b) the distance is calculated from the point of the diversion followed by the cruise for the approved maximum diversion time.

(c) for the purposes of computing distances, credit for drift-down may be taken.

2.8. Airworthiness certification requirements for EDTO beyond the threshold time

(1) During the airworthiness certification procedure for an aeroplane type intended for EDTO, the air service operator shall ensure that the required level of safety shall be maintained under conditions which may be encountered during such operations, such as flight for extended periods following failure of an engine and the aeroplane's EDTO significant systems.

(2) Information or procedures specifically related to extended diversion time operations shall be incorporated into the AFM, the maintenance manual, the EDTO configuration, maintenance and procedure document {CMP) or other appropriate documentation.

(3) The air service operator shall provide aeroplane manufacturer documentation that specifies the aeroplane's EDTO significant systems and, where appropriate, any time-limiting factors associated with those systems.

2.9. Maintaining operational approval

(1) In order to maintain the required level of safety on routes where aeroplanes are permitted to operate beyond 180 minutes, an air service operator shall ensure that:

(a) the airworthiness certification of the aeroplane type specifically permits operations beyond the threshold time, taking into account the aeroplane's system design and reliability aspects;

(b) the reliability of the propulsion system is such that the risk of double engine failure from independent causes is extremely remote, and found acceptable to support the diversion time being approved;

(c) any special maintenance requirements are fulfilled;

(d) specific flight dispatch requirements are met;

(e) the necessary in-flight operational procedures are established; and

(f) specific operational approval is granted by the Executive Director.

(2) The Executive Director shall determine that:

(a) the air service operator has the capability to achieve and maintain an acceptable level of propulsion system reliability based on the operator's past experience or a process review;

(b) for an air service operator with Past experience, this determination shall include trend comparisons of the air service operator's data with other air service operators, as well as the world fleet average values and the application of a qualitative judgement that considers all of the relevant factors. The air service operator's past record of propulsion system reliability with related types of engines shall be reviewed, as well as its record of achieved systems reliability with the airframe-engine combination for which authorisation is sought to conduct EDTO;

(c) an air service operator without such experience, has established a programme that results in a high degree of confidence that the propulsion system reliability appropriate to the EDTO would be maintained;

(d) the air service operator has developed a system for reporting the events as NAM-CATS 140

(e) following EDTO operational approval, the air service operator continues to monitor the propulsion system reliability for the aircraft - engine combination used in EDTO, and takes action as required for the specified IFSD rates.

2.10. Airworthiness modifications and maintenance programme requirements

(1) An air service operator’s maintenance programme shall ensure that:

(a) the titles and numbers of all airworthiness modifications, additions and changes which were made to qualify aeroplane systems for EDTO are provided for;

(b) any changes to maintenance and training procedures, practices or limitations established in the qualification for EDTO are submitted to the Executive Director before such changes are adopted;

(c) a reliability monitoring and reporting programme is developed and implemented prior to approval and continued after approval;

(d) prompt implementation of required modifications and inspections which may affect propulsion system reliability is undertaken;

(e) procedures are established which prevent an aeroplane from being dispatched for an extended diversion time operation after engine shutdown or EDTO significant system failure on a previous flight until the cause of such failure has been positively identified and the necessary corrective action has been completed. Confirmation that such corrective action has been effective may require the successful completion of a subsequent flight prior to dispatch on an extended diversion time operation;

(f) a procedure is established to ensure that the airborne equipment will continue to be maintained at the level of performance and reliability required for extended diversion time operations; and

(g) a procedure is established to minimize scheduled or unscheduled maintenance during the same maintenance visit on more than one parallel or similar EDTO significant system. Minimization can be accomplished by staggering maintenance tasks, performing and supervising maintenance by a different technician, or verifying maintenance corrective actions prior to the aeroplane entering an EDTO threshold.

3. Requirements for operations beyond 120 minutes and up to 180 minutes, to an en-route alternate aerodrome

(1) An air service operator conducting operations beyond 120 minutes and up to 180 minutes, from a point on a route to an enroute alternate aerodromes, shall ensure that –

(a) for all aeroplanes –

(i) enroute alternate aerodrome is identified and appear on the ATS flight plan; and

(ii) the most up-to-date information is obtained by the flight crew on identified enroute alternate aerodromes, including operational status and meteorological conditions.

(b) for an aeroplane with two turbine engine, the current and up-to-date information provided to the flight crew indicates that conditions at identified en-route alternate aerodromes shall be at or above the operator's established aerodrome operating minima for the operation at the estimated time of use.

(2) In addition to the requirements in subparagraph (1), an air service operator shall ensure that the following are taken into account and provide the overall level of safety intended by the provisions of this technical standard –

(a) operational control and flight dispatch procedures

(i) operational control as defined in Part 1 of the regulations;

(ii) flight dispatch procedures refer to the method of control and supervision of flight operations. This does not imply a specific requirement for licensed flight dispatchers or a full flight following system.

(b) operating procedures

(i) operating procedures refer to the specification of the organisation and methods established to exercise operational control and flight dispatch procedures in the appropriate manual(s) and shall cover at least a description of responsibilities concerning the initiation, continuation, termination or diversion of each flight as well as the method of control and supervision of flight operations.

(c) training programmes

(i) training programmes refer to the training for pilots and flight operations officers or flight dispatchers in operations covered by this technical standard and the following sections.

(3) Converting diversion times to distances

(a) Air service operators conducting operations beyond 120 minutes and up to 180 minutes, from a point on a route to an enroute alternate aerodrome, shall satisfy the Executive Director that the aircraft's approved one-engine-inoperative (OEI} speed or approved all-engines operative (AEO) speed allows such operations to be undertaken safely.

(b) Conditions to be used by the air service operator when converting diversion times to distances:

(i) for the purpose of this technical standard. an approved one-engine-inoperative (OEI) speed or approved all-engines operative {AEO) speed is any speed within the certified flight envelope of the aeroplane;

(ii) to determine whether a point on the route is beyond 180 minutes to an enroute alternate for an aeroplane with two engines, the air service operator shall select an approved OEI speed. The distance is calculated from the point of the diversion followed by cruise for 180 minutes, in ISA and still-air conditions. For the purposes of computing distances, credit for the drift-down may be taken; and

(iii) to determine whether a point on the route is beyond 180 minutes to an enroute alternate for an aircraft with more than two engines, the air service operator

shall select an approved AEO speed. The distance is calculated from the point of the diversion followed by the cruise for 180 minutes, in ISA and still-air conditions. For the purposes of computing distances, credit for the drift-down may be taken.

(4) When considering airworthiness requirements, an air service operator shall ensure that:

(a) the aircraft configuration and overall aircraft reliability for operations beyond 120 minutes and up to 180 minutes, to an enroute alternate aerodrome have been established by the Type Certificate holder;

(b) the aircraft configuration and overall aircraft reliability shall have a type design approval;

(c) the capability of the time limited system, if any, must be indicated in the aeroplane flight manual (directly or by reference) relevant to operations beyond 120 minutes and up to 180 minutes. to an enroute alternate aerodrome;

(d) they maintain the aircraft in an airworthy condition in accordance with procedures contained in the MCM; and

(e) an approved AMP and MEL for the aircraft are established.

(5) The written submission to the Authority as stated in regulation 135.08.1(7) should be accompanied by the following supporting documents:

(a) a safety case;

(b) evidence of compliance with 3 (1), (2) (3) and (4) of this technical standard;

(c) evidence of a safety risk assessment in accordance with NAM-CATS 140, conducted by the operator covering at least the following:

(i) the capabilities of the operator in conducting such operations;

(ii) the overall reliability of the aeroplane to be operated under such operations;

(iii) the reliability of each time-limited system, if any, of the aeroplane to be operated for such operations;

(iv) information from the aeroplane manufacturer relevant to such operations; and

(v) any specific mitigation measures to be taken by the operator.

(d) An acceptable Management of Change.

(6) Submissions will be considered on a case by case basis in order to determine the operator's operational capability up to 180 minutes.

(7) Where the air service operator has been authorised through their written submission, to conduct operations within the 120-180min segment. and has already conducted operations in accordance with regulation 135.08.1(7) shall provide a reliability programme report every 4 months to the Executive Director of the following, as applicable:

(a) the type of aeroplane used for such operations;

(b) interruption, delay or cancellation due to a technical reason;

(c) all aircraft systems controlled by the reliability programme;

(d) any system defect summary report where the significant system defect rate exceeds the alert level established in the operator's approved reliability programme;

(e) every usage of a minimum equipment list for significant systems; and

(f) every unscheduled removal of a significant system component from an aeroplane.

135.08.5 ADDITIONAL REQUIREMENTS FOR OPERATIONS OF SINGLE ENGINE TURBINE AND PISTON POWERED AEROPLANES AT NIGHT OR IN IMC

1. Transportation of passengers or cargo in single-engine turbine powered aeroplanes IMC or night operations

(1) The following technical standard prescribes the criteria and provisions for operating single-engine turbine powered aeroplanes in passenger-carrying and cargo-only operations under IMC or at night.

(2) An operator approved in its OpSpecs to conduct passenger-carrying operations under IMC or at night is also approved to conduct cargo-only operations. The OpSpecs shall clearly specify the extent of the approval.

(3) An operator approved to conduct cargo-only operations under IMC or at night is not approved to conduct passenger-carrying operations unless authorised in its OpSpecs to do so.

2. Aeroplane requirements

2.1. Passenger-carrying operations

(1) A single-engine aeroplane approved to carry passengers shall meet the requirements of this subsection.

(2) The following requirements relate to the aeroplane engine and airframe combination

(a) in addition to the instruments and equipment specified in Subpart 5, as applicable, the aeroplane must be powered by a turbine engine.

(3) Turbine engine reliability

(a) An operator’s turbine engine reliability shall be shown to have a power loss rate of less than 1 per 100 000 engine hours;

(b) An operator shall be responsible for engine trend monitoring.

(c) To minimise the probability of in-flight engine failure, an engine shall be equipped with:

(i) an ignition system that activates automatically, or is capable of being operated manually, for take-off and landing, and during flight, in visible moisture;

(ii) a magnetic particle detection or equivalent system that monitors the engine, accessories gearbox, and reduction gearbox, and which includes a flight deck caution indication; and

(iii) an emergency engine power control device that permits continuing operation of an engine through a sufficient power range to safely complete the flight in the event of any reasonably probable failure of the fuel control unit.

(4) Systems and equipment

(a) A Single-engine turbine-powered aeroplane approved to operate at night or in IMC shall be equipped with the following systems and equipment intended to ensure continued safe flight and to assist in achieving a safe forced landing after an engine failure, under all allowable operating conditions:

(i) two separate electrical generating systems, each one capable of supplying all probably combinations of continuous in-flight electrical loads for instruments, equipment and systems required at night or in IMC;

(ii) a radio altimeter;

(iii) an emergency electrical supply system of sufficient capacity and endurance, following loss of all generated power, to as a minimum:

(aa) maintain an operation of all essential flight instruments, communication and navigation systems during a descent from the maximum certificated altitude in a glide configuration to the completion of a landing;

(bb) lower the flaps and landing gear, if applicable;

(cc) provide power to one pitot heater, which must serve an air speed indicator clearly visible to a pilot;

(dd) provide for operation of the landing light specified in subparagraph (x);

(ee) provide for one engine restart, if applicable, and

(ff) provide for the operation of the radio altimeter;

(iv) two attitude indicators, powered from independent sources;

(v) a means to provide for at least one attempt at engine re-start;

(vi) airborne weather radar;

(vii) a certified area navigation system capable of being programmed with the positions of an aerodrome and safe forced landing areas, and providing instantly available track and distance information to those locations;

(viii) for passenger operations, passenger seats and mounts which meet dynamically tested performance standards, and which are fitted with a shoulder harness or a safety belt with a diagonal shoulder strap for each passenger seat;

(ix) in pressurized aeroplane, sufficient supplemental oxygen for all occupants for descent following engine failure at the maximum glide performance from the maximum certificated altitude to an altitude at which supplemental oxygen is no longer required;

(x) a landing light that is independent of the landing gear and is capable of adequately illuminating the touchdown area in a night forced landing; and

(xi) an engine fire warning system.

(4) An operator must establish and maintain an engine trend monitoring programme acceptable to the Executive Director. An aeroplane for which the individual certificate of airworthiness was issued on or after 1 January 2005 shall have an automatic trend monitoring system.

2.2. Cargo-only operations

(1) A single-engine aeroplane approved to carry cargo only shall meet the requirements of this subsection.

(2) In addition to the instruments and equipment specified in Subpart 5 as applicable to IFR flight, the aeroplane shall be powered by -

(a) a turbine engine that meets the criteria prescribed by subsection 2.1 of this TS; or

(b) a piston engine that meets specific performance criteria and a preventative maintenance programme acceptable to the Executive Director and be equipped with -

(i) a constant speed propeller equipped with an anti-icing or de-icing system; and

(ii) a fuel injection system.

2.3. Additional requirements for single-engine IMC or night operations

(1) Where an aeroplane will be operated in IMC or night flight conditions without a second-in-command, the instruments and equipment required for single-pilot IFR, as specified in CAR 135.08.9, shall also be met.

(2) An aeroplane must be of a design or have approved warning systems that will allow for the easy identification of engine or airframe icing.

(3) An aeroplane shall only be dispatched in accordance with an approved minimum equipment list or configuration deviation list, as applicable.

(4) An aeroplane shall be equipped with -

(a) two separate electrical generating systems, each one capable of supplying all probable combinations of continuous in-flight electrical loads for instruments, equipment and systems required at night or in IMC or both at night in IMC;

(b) a radio altimeter;

(c) an emergency electrical supply system of sufficient capacity and endurance, following loss of all generated power, to as a minimum:

(i) maintain an operation of all essential flight instruments, communication and navigation systems during a descent from the maximum certificated altitude in a glide configuration to the completion of a landing;

(ii) lower the flaps and landing gear, if applicable;

(iii) provide power to one pitot heater, which must serve an air speed indicator clearly visible to a pilot;

(iv) provide for operation of the landing light specified in subparagraph (j);

(v) provide for one engine restart, if applicable; and

(vi) provide for the operation of the radio altimeter;

(d) two attitude indicators, powered from independent sources;

(e) a means to provide for at least one attempt at engine re-start;

(f) airborne weather radar;

(g) a certified area navigation system capable of being programmed with the positions of aerodrome and safe forced landing areas, and providing instantly available track and distance information to the locations;

(h) occupants' seats and mounts which meet dynamically tested performance standards and which are fitted with a shoulder harness or a safety belt with a diagonal shoulder strap for each seat;

(i) in pressurized aeroplane, sufficient supplemental oxygen for all occupants for descent following engine failure at the maximum glide performance from the maximum certificated altitude to an altitude at which supplemental oxygen is no longer required;

(j) a landing light that is independent of the landing gear and is capable of adequately illuminating the touchdown area in a nigh forced landing; and

(k) an engine fire warning system.

(5) An aeroplane shall carry an emergency electrical supply of sufficient capacity and endurance following loss of all generated power to -

(a) power essential electrical systems, including auto pilot, flight instruments and navigation systems, to allow for a descent at normal glide speed and configuration from the aeroplane's maximum certificated altitude to completion of a landing;

(b) lower the flaps and landing gear, if applicable;

(c) provide power to one pitot heater, which must serve an air speed indicator clearly visible to the pilot;

(d) provide for operation of the landing light specified in subsection (4);

(e) provide for one engine restart, if applicable; and

(f) provide for the operation of the radio altimeter.

3. Flight crew requirements

(1) A PIC and, where an aeroplane includes a SIC, a SIC shall possess, as a minimum, the following current licences and ratings and have acquired at least the flight experience indicated in Table 1.

(2) A flight crew shall include a SIC in the event a PIC does not meet the minimum total flight time specified in Table 1: Provided that a PIC's total flight time shall not be less than 500 hours.

TABLE 1

Minimum flight crew licences, ratings and flight experience to operate a single-engine aeroplane in IFR or night flight

Type of Operation	PIC				SIC (if applicable) [1 and 2]	
	Licence	Min. Total Flight Time (hours)	Min Flight Time (hours)		Licence	Min. Total Flight Time (hours)
			IF	Night		

Passenger (with or without cargo) carriage	CPL/IFR	1000 including a minimum of 200 hrs as PIC	100	100	CPL/IFR	200
Cargo only carriage	CPL/IFR	1000 including a minimum of 150 hrs as PIC	50	50	CPL/IFR	200

Notes -

1. *Where an aeroplane type requires a type rating, each flight crew member shall have that type rating on his or her licence.*
2. *An SIC is required if an operator is approved for CAT II or III approaches.*
3. *An operator's flight crew training and checking shall be appropriate to night and/or IMC operations by single engine turbine-powered aeroplanes, covering normal, abnormal and emergency procedures and, in particular, engine failure, including descent to a forced landing in night and/or in IMC conditions.*

(3) An operator shall meet the training requirements specified in Section 3, 3.9 of TS 135.03.3. The training programme shall be completed for each specific aeroplane type that a pilot flies and which is authorised to be operated in IMC or at night.

(4) In addition to the training prescribed TS 135.03.3, each person assigned to act as a flight crew member in single engine (SE) IMC or night flight shall undergo a pilot proficiency check (PPC), a portion of which shall be demonstrated in an approved synthetic training device, if available in the country, including all emergency procedures that cannot be safely demonstrated in an aeroplane. Where such device is not available in Namibia, the check shall be accomplished in an aeroplane in a manner acceptable to the Executive Director.

(5) A PPC referred to in paragraph (4) above shall be conducted by an authorised officer, DFE or Grade I or II flight instructor: Provided such person has, at least, accomplished the training required by this TS and a PPC on the aeroplane type.

(6) Each person who successfully passes a PPC shall receive certification in his or her training records that authorises them to operate SE aeroplanes in IMC or at night while transporting passengers or cargo, as applicable.

4. Special procedures requirements

(1) An operator shall publish in its operations manual special procedures for the conduct of single-engine operations while transporting passengers in IMC or at night and such procedures shall include at least the provisions specified in paragraphs (2) through (4).

(2) A pilot shall operate an aeroplane as pilot flying for at least 50 flight hours under IFR and under the supervision of a PIC qualified on type prior to being authorised for solo flight in IMC: Provided that an operator shall not assign a pilot under supervision as a PIC for a flight until the 50 flight hours have been attained.

(3) Operator planning

3.1 An operator route planning shall take account relevant information in the assessment of intended routes or areas of operations, including the following:

(a) the nature of the terrain to be overflown, including the potential for carrying out a safe forced landing in the event of an engine failure or major malfunction;

(b) weather information, including seasonal and other adverse meteorological influences that may affect the flight; and

(c) other criteria and limitations as specified by the Executive Director.

3.2 An operator shall identify aerodrome or safe forced landing areas available for use in the event of engine failure, and the position of the aerodrome shall be programmed into the area navigation system.

3.3 An operator shall apply route limitation criteria for single-engine piston and turbine-powered aeroplane operating at night, in IMC or both at night and in IMC on over water operations if beyond gliding distance from an area suitable for a safe forced landing or ditching having regard to the characteristics of an aeroplane, seasonal weather influences, including likely sea state and temperature, and the availability of search and rescue services.

(4) Special procedures shall be developed for -

(a) primary and secondary actions, including passenger briefing, to be taken in the event of loss of the power plant or other malfunctions that would necessitate an immediate emergency landing;

(b) immediate actions to be taken in the event of encountering moderate, heavy or severe icing conditions; and

(c) procedures for the quick and accurate diversion to an unplanned alternate including ATC and flight following procedures.

(5) The Executive Director may require additional procedures, restrictions or conditions in the interests of safety.

(6) Event reporting

6.1 An operator approved for operations by single-engine piston and turbine-powered aeroplane at night or in IMC shall report all significant failures, malfunctions or defects to the Executive Director who in turn will notify the State of Design.

6.2 The Executive Director shall review the safety data and monitor the reliability information so as to be able to take any actions necessary to ensure that the intended safety level is achieved. The Executive Director will notify major events or trends of particular concern to an appropriate Type Certificate Holder and the State of Design.

(7) Minimum list

An operator shall have an approved minimum equipment list based on the MMEL, where available to specify the operating equipment required for night, IMC operations or both night and IMC operations, and for day or VMC operations. A MEL shall account as per systems and equipment detailed in subsection 2.3 (4).
Where an operator does not have an approved MMEL, the provisions of POH or AFM shall be complied with.

135.08.9 ADDITIONAL REQUIREMENTS FOR SINGLE PILOT OPERATIONS UNDER IFR OR NIGHT VFR FLIGHT

1. General

This technical standard states the provision for the operation of an aeroplane with passengers on board in IFR flight without a second-in-command.

Note - *The term "single-pilot IFR" will be used to denote a pilot authorised to fly in IMC or at night without a second-in-command.*

2. Aeroplane equipment requirements

In addition to the equipment required by Subpart 5 of this Part, an aeroplane involved in a single-pilot operation in IMC or at night shall be equipped with -

(a) a serviceable autopilot that has at least an altitude hold and heading select modes;

(b) a headset with a boom microphone or equivalent and a transmit button on the control column; and

(c) means of displaying charts and enables the charts to be readable in all ambient light conditions.

3. Pilot qualification, training and proficiency requirements

(1) A pilot shall have the following experience and recency-

(a) for operations under IFR or at night, have accumulated at least 50 hours flight time on the class of aeroplane, of which at least 10 hours shall be as PIC;

(b) for operations under IFR, have accumulated at least 25 hours flight time under IFR on the class of aeroplane, which may form part of the 50 hours flight time in sub-paragraph (a); and

(c) for operations at night, have accumulated at least 15 hours flight time at night, which may form part of the 50 hours flight time in sub-paragraph (a).

(d) for single pilot Operation IFR recency –

(i) at least three IFR flights, including three instrument approaches carried out during the preceding 90 days on the class of aeroplane in a single pilot role; or

(ii) an IFR instrument approach proficiency check carried out on the Class of an aeroplane such an aeroplane during the preceding 90 days;

(e) for single pilot operation night recency in terms of regulation 91.02.4.

(2) A pilot shall complete the training requirements specified in subsection 3.10 of TS 135.03.3 and a single-pilot pilot proficiency check (PPC) prior to being assigned to single-pilot duties.

(3) A PPC shall be in the aeroplane type or variant flown unless an operator has been approved for aircraft grouping for training and PPC purposes, in which case the sequencing of a PPCs shall be as provided in such approval and shall be conducted so as to include at least the following -

(a) knowledge of the regulatory and company operating procedures relating to single-pilot IFR;

(b) knowledge of an autopilot operations and limitations;

(c) performance of normal and emergency procedures as a single pilot without assistance;

(d) passenger briefings as required by this Subpart including emergency briefings and cabin preparation for emergency evacuation; and

(e) demonstration of the use of the autopilot during appropriate phases of flight.

(4) Where a pilot successfully completes the PPC referred to in paragraph (2), a pilot's training records shall be endorsed for single-pilot IFR.

4. Special conditions and procedures

(1) All flights operated in IFR flight shall be restricted to the following altitudes or flight levels -

(a) in case of pressurised aeroplanes all flights shall be conducted at or below FL 250 unless the aeroplane manufacturer has established the conditions under which flight above such altitude may be undertaken without a second-in-command with respect to access to an emergency source of oxygen in the event an emergency descent is required and the pilot has trained for such an event at or near the highest altitude authorised for that aeroplane; and

(b) in the case of unpressurised aeroplanes, all flights shall be conducted at or below the altitude at which the pilot is not required by these regulations to be using continuous oxygen.

(2) A pilot's single-pilot IFR proficiency may be transferred to another operator: Provided -

(a) the proficiency validity has not yet expired;

(b) an aeroplane to be operated is of the same type and variant on which the current PPC was conducted;

(c) the pilot has received training to ensure the pilot is familiar and competent in all procedures used by the other operator; and

(d) the other operator is authorised in its operations specification to transport persons in aeroplanes in IMC without a second-in-command.

(3) Flight crew equipment

A flight crew member assessed as fit to exercise the privileges of a license, subject to the use of suitable correcting lenses, shall have a spare set of the correcting lenses readily available when exercising those privileges.

135.08.11 REFUELLING AND DEFUELLING WITH PASSENGERS ON BOARD

Aeroplanes may be fuelled with passengers embarking, disembarking or on board under the following conditions -

(a) in order to ensure that crew members receive prompt notification of a situation threatening safety such as major fuel spill or a fire, a means is established for the ground crew supervising the fuelling to alert the qualified personnel on board the aeroplane that the passengers must be deplaned or evacuated as necessary;

(b) the aeroplane engines are not running unless the aircraft incorporates a propeller brake and the brake is set;

(c) during the fuelling process -

(i) aeroplane ground power generators or other electrical ground power supplies must remain connected or disconnected;

(ii) combustion heaters installed on the aeroplane (e.g. wing and tail surface heaters, integral cabin heaters) are not operated;

(iii) known high energy equipment such as High Frequency (HF) radios are not operated, unless in accordance with the aeroplane manufacturer's approved flight manual where the manual contains procedures for the use of this equipment during fuelling;

(iv) weather-mapping radar equipment in the aeroplane is not operated unless in accordance with the manufacturer's approved aeroplane flight manual where the manual contains procedures for use during fuelling;

(v) aeroplane batteries are not being removed or installed;

(vi) external battery chargers are not being connected, operated or disconnected;

(vii) aeroplane-borne APUs which have an efflux discharging into the zone are not started after filler caps are removed or fuelling connections are made;

(viii) if an auxiliary power unit is stopped for any reason during fuelling it shall not be restarted until the flow of fuel has ceased and there is no risk of igniting fuel vapours; however, the APU may be operated in accordance with the manufacturer's approved aeroplane flight manual if the manual contains procedures for starting the APU during fuelling;

(ix) electric tools or similar tools likely to produce sparks or arcs are not being used; and

(x) photographic equipment is not used within 3m of the fuelling equipment or the fill or vent points of the aeroplane fuel systems;

(d) fuelling is immediately suspended when there are lightning discharges within 8km of the aerodrome;

(e) the aeroplane is fuelled in accordance with manufacturer's procedures for that type of aeroplane;

(f) the aeroplane emergency lighting system is armed or on, if applicable;

(g) "No Smoking" signs on board the aeroplane are illuminated, if installed;

(h) procedures are established to ensure that passengers do not smoke, operate portable electronic devices or otherwise produce sources of ignition;

(i) at least the entry door through which the passengers embarked is designated as the evacuation exit during fuelling and is open;

(j) the designated evacuation exits during fuelling are identified by aeroplane type and published in the operator's operations manual and are clear and available for immediate use by passengers and crew members should an evacuation be required;

(k) the operator has procedures in place to ensure that there is a ready escape route from each designated evacuation exit during fuelling;

(l) a member of the flight crew or a person designated by the operator who has received training in fuelling operations with passengers on board shall be in attendance and identified to the passengers as the person responsible for cabin safety during the fuelling procedures; and

(m) if over-wing refuelling or defueling with passengers on board is undertaken, an emergency exit shall be available for use in the event of an evacuation and such exit shall be opposite to where the refuelling or defueling is taking place.

135.08.15 OPERATIONAL CONTROL AND SUPERVISION OF FLIGHT OPERATIONS

1. Operational control and supervision

(1) An operator shall exercise operational control over its flights through its operational control system (OCS).

(2) The person responsible for flight operations shall have the ultimate decision-making authority in all matters affecting flight operations in general, and the OCS in particular,

after consideration of any other factors that could impact on the execution of a flight such as financial, commercial or other non-operational considerations.

(3) The operator is responsible for putting in place communication equipment and facilities as appropriate to the operator's flight following system and ensuring such equipment is serviceable during the period of time any company flight is in progress.

(4) The pilot-in-command is responsible for the release of each flight and has the final authority as to the continuation, diversion or termination of a flight.

(5) The air service operator shall specify flight planning procedures, including the duties of the PIC regarding flight preparation as prescribed in CAR 91.02.7, to provide for the safe conduct of the flight based on considerations of aircraft performance, other operating limitations and relevant expected conditions on the route to be followed and at the aerodromes concerned.

2. Approval of an operational control system

(1) Each operator shall publish in its operations manual the details of its proposed OCS including pre- and post-flight procedures, flight following or flight monitoring, as applicable, and procedures to be followed in the event of missing or overdue flights and during emergency or abnormal situations. Upon approval of the operations manual, the OCS shall be deemed to have been approved by the Executive Director.

(2) An operator choosing, in order to meet its own operational needs, to dispatch its flights under an OCS that utilises a flight operations officer (FOO) for flight release and flight monitoring shall meet the requirements of a Type A operational control system as specified in TS 135.08.15 of Document NAM-CATS OPS 135.

(3) The Executive Director may require an operator to upgrade its OCS in order to satisfy the conditions for issue of certain operations specifications (OpSpecs).

3. Description of the required operational control system

The minimum requirements of an OCS under this Part are as follows -

(a) Responsibility and authority

Operational control is delegated to the PIC of a flight by the operations manager who retains responsibility for the day-to-day conduct of flight operations.

(b) Centres

Current information on the location of the operator's aeroplanes shall be maintained at the main base of operations or, where appropriate, at a sub-base of operations.

(c) Communications

The operator shall ensure that the flight crew has a means to communicate with the operator while on the ground.

(d) Personnel on duty

(i) An operator shall ensure personnel qualified in accordance with CAR 135.02.7 are available during flight time as applicable to the OCS approved for use by the company.

(ii) The operator shall clearly identify in its operations manual the duties and responsibilities of the persons responsible for flight following.

(iii) The operator shall ensure that each flight follower is trained in accordance with the requirements of its approved training programme.

(e) Flight release

(i) Flights operated under the operator's OCS are pilot self-dispatched and released in accordance with the operator's established procedures. Such procedures shall be published in the operator's operations manual.

(ii) The person responsible for the development of the operational flight plan (OFP), shall receive training in every aspect of its preparation. The OFP shall meet the requirements of
TS 135.04.5 and may be in any format at the operator's discretion but such format shall be standard and used by all flight crew.

(iii) The signature or alternative means of signifying acceptance of the OFP by the PIC shall constitute a flight release and shall certify that -

(aa) the OFP has been prepared and accepted in accordance with the procedures specified in the operations manual; and

(bb) the flight is safe to proceed.

(f) Flight monitoring and flight following

(i) An operator shall ensure that procedures are established as part of the OCS to enable it to determine if a flight is overdue or has had to divert.

(ii) Where communications facilities permit, the PIC is expected to report departures and arrivals to the person assigned to the flight following of that flight. At the very least the PIC shall notify the operator upon arrival at the final destination of a particular flight or series of flights.

(iii) The PIC, though solely responsible for flight monitoring, shall be supported by a flight following system containing the following elements -

(aa) a flight follower, qualified in accordance with Subpart 3 and knowledgeable in the operator's flight alerting procedures, on duty and able to respond to requests by the PIC for information related to the flight. Such information may include meteorological information without analysis or interpretation; and

(bb) the ability by the operator to have a means to follow the progress of each flight from its commencement to its termination, including any intermediate stops or diversions from the flight planned route.

Note - *Use of air traffic services in determining the location of a flight is adequate*.

4. Declaration and action in an emergency

(1) In an emergency situation that requires immediate decision and action, the PIC shall take any action deemed necessary for the safety of the aeroplane and passengers.

(2) Where the assigned flight follower or operations manager becomes aware of any emergency situation that could pose a hazard to a flight in progress, the flight follower shall make every effort to advise the PIC of such emergency by the quickest means available. Furthermore, the flight follower shall -

(a) remain available to the PIC of that flight on a continuous basis until -

(i) the threat of such emergency has passed;

(ii) the PIC has made a decision and acted upon it and it has been determined that the operator's assistance is no longer required; or

(iii) the flight is handed off to another competent person who is able to be of assistance;

(b) relay required messages through third parties as necessary to communicate with the flight; and

(c) notify the nearest air traffic services unit and appropriate authority of the emergency and request such assistance as may be necessary.

(3) In the event an aeroplane becomes overdue or missing, the overdue or missing aeroplane procedures, as appropriate, shall be followed as prescribed in the operations manual. Such procedures shall include, as a minimum, reporting the overdue or missing aeroplane to an air traffic services unit, the appropriate authority and search and rescue authorities.

(4) Whenever a PIC, flight follower or operations manager declares an emergency, he or she shall keep the appropriate ATC facility and dispatch centres fully informed as to the progress of the flight.

135.08.25 FUEL POLICY

1. Planning criteria for aeroplanes

(1) An operator shall base the fuel policy, including calculation of the amount of fuel to be carried by an aeroplane, on the planning criteria specified in this TS.

(2) If the operator's fuel policy is not based on planning as provided in paragraph (3), (4) or (5), the amount shall be based on -

(a) taxi fuel, which must not be less than the amount, expected to be used prior to take-off. Local conditions at the departure aerodrome and APU consumption shall be taken into account;

(b) trip fuel, which must include -

(i) fuel for take-off and climb from aerodrome elevation to initial cruising level/altitude, taking into account the expected departure routing;

(ii) fuel from top of climb to top of descent, including any step climb/descent;

(iii) fuel from top of descent to the point where the approach is initiated, taking into account the expected arrival procedure; and

(iv) fuel for approach and landing at the destination aerodrome;

(c) contingency fuel which shall, in addition to the factors noted in section 2 of this TS, be -

(i) the calculated result of a data-driven method using safety risk assessment based on a fuel consumption monitoring programme or advanced use of available enroute alternates; or

(ii) 5 per cent of the planned trip fuel based on the consumption rate used to plan the trip fuel but in any case not lower than an amount to fly for 5 minutes at holding speed at 1 500 feet above the destination aerodrome in standard conditions;

(d) alternate fuel, which must be sufficient for -

(i) if a destination alternate aerodrome is required -

(aa) a missed approach from applicable MDA/DH at the destination aerodrome to missed approach altitude, taking into account the complete missed approach procedure;

(bb) a climb from the missed approach altitude to cruising level/altitude;

(cc) the cruise from top of climb to top of descent;

(dd) descent from top of descent to the point where the approach is initiated, taking into account the expected arrival procedure; and

(ee) executing an approach and landing at the destination alternate aerodrome;

(ii) if two destination alternates are required, alternate fuel shall be sufficient to proceed to the alternate which requires the greater amount of alternate fuel allowing for the consumption specified in sub-sub-paragraph (i); or

(iii) if a destination alternate aerodrome is not required, as specified in CAR 135.08.1(4), an amount of fuel sufficient to enable the aeroplane to hold for

15 minutes at 1 500ft above destination aerodrome elevation in standard conditions;

(e) final reserve fuel, which shall be -

(i) for aeroplanes with reciprocating engines, fuel to fly for 45 minutes; or

(ii) for aeroplanes with turbine engines, fuel to fly for 30 minutes,

at holding speed at 1 500 feet above aerodrome elevation in standard conditions, calculated with the estimated mass on arrival at the alternate or the destination, when no alternate is required;

(f) additional fuel, which shall be a supplementary amount of fuel required if the minimum fuel calculated in accordance with sub- paragraphs (c) and (d) above is not sufficient to permit the aeroplane -

(i) following the possible failure of a power unit or loss of pressurisation, whichever requires the greater amount of fuel based on the assumption that such a failure occurs at the most critical point along the route, to -

(aa) descend as necessary and proceed to an adequate aerodrome;

(bb) hold there for 15 minutes at 1 500 feet above aerodrome elevation in standard conditions; and

(cc) make an approach landing; and

(ii) meet additional requirements not covered in sub-paragraph (f)(i); and

(g) discretionary fuel, which is at the discretion of the PIC.

(3) If an operator's fuel policy includes replanning based on the use of a decision point while enroute, the amount of fuel shall be the greater of sub-paragraph (a) or (b) below -

(a) the sum of -

(i) taxi fuel as specified in paragraph (2)(a) above;

(ii) trip fuel to the destination aerodrome as specified in paragraph (2)(b) above, via the decision point;

(iii) contingency fuel equal to not less than 5% of the estimated fuel consumption from the decision point to the destination aerodrome;

(iv) alternate fuel, if a destination alternate is required, as specified in paragraph (2)(d) above;

(v) final reserve fuel as specified in paragraph (2)(e) above;

(vi) additional fuel as specified in paragraph (2)(f) above; and

(vii) extra fuel, if required by the PIC; or

(b) the sum of -

(i) taxi fuel as specified in paragraph (2)(a) above;

(ii) the estimated fuel consumption from the departure aerodrome to a suitable en route alternate, via the decision point;

(iii) contingency fuel equal to not less than 3% of the estimated fuel consumption from the departure aerodrome to the enroute alternate;

(iv) final reserve fuel as specified in paragraph (2)(e) above;

(v) additional fuel as specified in paragraph (2)(f) above; and

(vi) discretionary fuel, if required by the PIC.

(4) If an operator's fuel policy includes planning to a destination alternate where the distance between the destination aerodrome and the destination alternate is such that a flight can only be routed via a predetermined point to one of these aerodromes, the amount of fuel must be the greater of sub-paragraph (a) or (b) below -

(a) the sum of -

(i) taxi fuel as specified in paragraph (2)(a) above;

(ii) trip fuel from the departure aerodrome to the destination aerodrome, via the predetermined point;

(iii) contingency fuel calculated in accordance with paragraph (2)(c) above;

(iv) additional fuel as specified in paragraph (2)(f) above, if required, but not less than -

(aa) for aeroplanes with reciprocating engines, fuel to fly for 45 minutes plus 15% of the flight time planned to be spent at cruising level or two hours, whichever is less; or

(bb) for aeroplanes with turbine engines, fuel to fly for two hours at normal cruise consumption after arriving overhead the destination aerodrome, including final reserve fuel; and

(v) discretionary fuel, if required by the PIC; or

(b) the sum of -

(i) taxi fuel as specified in paragraph (2)(a) above;

(ii) trip fuel from the departure aerodrome to the alternate aerodrome, via the predetermined point;

(iii) contingency fuel calculated in accordance with paragraph (2)(c) above;

(iv) additional fuel as specified in paragraph (2)(f) above, if required, but not less than -

(aa) for aeroplanes with reciprocating engines, fuel to fly for 45 minutes; or

(bb) for aeroplanes with turbine engines, fuel to fly for 30 minutes at holding speed at 1 500 feet above aerodrome elevation in standard conditions, including final reserve fuel; and

(v) discretionary fuel, if required by the PIC.

(5) If an operator's fuel policy includes planning to an isolated aerodrome for which a destination alternate is not required or does not exist as specified in CAR 135.08.1(2)(b), the amount of fuel at departure shall include -

(a) taxi fuel as specified in paragraph (2)(a) above;

(b) trip fuel as specified in paragraph (2)(b) above;

(c) contingency fuel calculated in accordance with paragraph (2)(c) above;

(d) final reserve fuel as specified in paragraph (2)(e) above;

(e) additional fuel as specified in paragraph (2)(f) above, if required, but not less than -

(i) for aeroplanes with reciprocating engines, fuel to fly for 45 minutes plus 15% of the flight time planned to be spent at cruising level, or two hours, whichever is the lesser; or

(ii) for aeroplanes with turbine engines, fuel to fly for two hours at normal cruise consumption after arriving overhead the destination aerodrome; and

(f) discretionary fuel, if required by the PIC.

2. Unforeseen circumstances

(1) At the planning stage, not all factors which could have an influence on the fuel consumption to the destination aerodrome can be foreseen. Therefore, fuel is carried to compensate for unforeseen circumstances such as -

(a) deviations of an individual aeroplane from the expected fuel consumption data;

(b) deviations from forecast meteorological conditions; and

(c) deviations from planned routings and/or cruising levels/altitudes.

(2) This fuel is to be included as part of the contingency fuel planning considerations.

135.08.31 LOW VISIBILITY OPERATIONS

1. Low visibility operations - certification overview

(1) Low visibility operations (LVO) are comprised of lower-than-normal visibility minima take-off (LVTO) and lower-than-normal weather and visibility minima approach operations (CAT II/III approaches). An applicant for an operations specification (OpSpec)

authorising low visibility operations shall meet the certification criteria contained in this TS.

(2) An operator shall only conduct LVO if -

(a) the operator has the appropriate OpSpecs and its aeroplanes are certificated for LVO and are equipped in accordance with this Part or an equivalent regulation accepted by the Executive Director;

(b) the operator has an approved training programme and the flight crews and supporting crews, as applicable, are trained and tested in LVO;

(c) the operator has established procedures to ensure LVO are conducted to the highest possible level of safety;

(d) a suitable system for recording approach or automatic-landing success and failure is established and maintained to monitor the overall safety of the operation;

(e) the ground-based equipment meets the LVO criteria for safe operation; and

(f) the low visibility operational zone is maintained in a sterile condition during LVO.

Note - *Failure to meet any of the above criteria or the certification standards described herein is cause for LVO OpSpecs to be suspended*.

(3) The available approvals for LVTO operations are dependent upon the aircraft category and aerodrome equipment and may be -

(a) RVR not lower than 75m if using an approved lateral guidance system; and

(b) RVR not less than 150m for Category A, B and C aeroplanes or RVR not less than 200m for Category D and E aeroplanes if not using an approved lateral guidance system.

(4) The categories referred to in subsection (3) are established on the basis of 1.3 times the stall speed of the aeroplanes in the landing configuration at maximum certificated landing mass and are as follows -

(a) Category A - less than 91 knots indicated airspeed;

(b) Category B - 91 knots indicated airspeed or more, but less than 121 knots indicated airspeed;

(c) Category C - 121 knots indicated airspeed or more, but less than 141 knots indicated airspeed;

(d) Category D - 141 knots indicated airspeed or more, but less than 166 knots indicated airspeed; and

(e) Category E - 166 knots indicated airspeed or more, but less than 211 knots indicated airspeed.

Note - *Procedures being in force, the Air Traffic Service shall report to the Executive Director details of all aeroplanes attempting an approach, the RVR visibility at the time, and the outcome of the approach attempt. This information will be used by the Authority in investigation of approaches attempted outside of the operator's equipment.*

(5) CAT II/III limits may be found TS 91.07.5 of Document NAM-CATS-OPS-91.

2. Low visibility operations - equipment requirements

(1) The operator of an aeroplane shall include the minimum equipment which shall be serviceable at the commencement of a LVTO or a CAT II or III approach in its operations manual.

(2) An operator shall establish procedures to ensure that the PIC satisfies him- or herself that the status of the aeroplane and the relevant airborne systems thereof is appropriate for the specific operation to be conducted.

3. Low visibility operations - facilities requirements

(1) The specific facilities required to ensure safe LVO involve both the aerodrome and the operator.

(2) No PIC of an aeroplane shall use an aerodrome for LVO, unless the aerodrome is approved for such operations by the appropriate authority of the State in which the aerodrome is located.

(3) The operator of an aeroplane intended to be used in LVO shall verify that low-visibility procedures have been established and are in force at the aerodromes where such operations are to be conducted.

(4) Criteria for the approval of an aerodrome to allow LVO to be conducted are -

(a) for low visibility take-offs with RVR of ≥150m (≥200m for Category D and E aeroplanes) to <400m -

(i) multiple RVR sources;

(ii) runway high intensity edge lights spaced 60m or less;

(iii) runway centreline lights spaced 15m or less and marking;

(iv) runway electrical multi-looping (multi-circuit design); and

(v) a secondary power supply;

(b) for low visibility take-offs with RVR ≥75m to <150m (<200m for Category D and E aeroplanes), in addition to those noted in sub-paragraph (a), a functioning lateral guidance system for take-off; and

Note - *For an aerodrome to be approved for LVTO operations, additional criteria are applied based on guidance in ICAO Document 9476, Manual of Surface Movement Guidance and Control Systems, and Document 9365, All Weather*

Operations Manual. It is up to the operator to ensure an aerodrome is suitably qualified for LVO before using it.

(5) The requirements for the operator to conduct LVO are -

(a) the establishment of procedures and instructions to be used for LVTO and Category II and III operations that will ensure -

(i) the PIC establishes that the status of the visual and non-visual facilities is sufficient prior to commencing a LVTO or a Category II and III approach; and

(ii) the PIC confirms with the air traffic service unit, before commencing a LVTO or a Category II and III approach, that appropriate low-visibility procedures are in force and the aircraft has been issued the appropriate clearances;

(iii) a 90m visual segment is available from the cockpit at the start of the take-off run; and

(iv) the required RVR value has been achieved for all of the relevant RVR reporting points;

(b) the flight deck crew members are properly qualified to carry out a low-visibility take-off or a Category II and III approach; and

(c) the PIC ensures there are no MEL items or other aeroplane unserviceabilities that would disqualify the flight from attempting a LVO.

4. Low visibility operations - personnel requirements

(1) Each operator applying for authorisation to conduct LVO shall establish and maintain an initial and recurrent ground and flight training programme as specified in section 3, 3.8 of TS 135.03.3 that will ensure its flight crew are proficient in operating in such environment and shall publish its LVO training programme in its operations manual.

(2) The flight deck crew qualification requirements are specific to the operator and the type of aeroplane operated and the operator shall ensure that each flight deck crew member completes a flight check (skills test) before conducting LVTO or Category II or III operations and that subsequent proficiency checks include LVO take-offs and approaches.

135.08.32 OPERATIONS WITH HEAD-UP DISPLAYS OR VISION SYSTEMS

1. Introduction

(1) This TS provides guidance for the approval for use of automatic landing systems, HUD, equivalent displays and vision systems intended for installation and operational use in aircraft engaged in commercial operations. These systems and hybrid systems may be installed and operated to enhance situational awareness or to obtain an operational credit such as lower minima for take-off, approach or landing operations. HUD and EVS may be installed separately or together as part of a hybrid system. Use of these systems during

instrument flight and any operational credit gained from their use requires approval from the Executive Director.

Note: *"Vision systems" is a generic term referring to the existing systems designed to provide images, i.e. EVS, SVS and CVS.*

(2) No pilot may use a HUD or EVS in flight in IMC unless such pilot has received the training and checking specified in this TS.

(3) No operator shall permit anyone to use a HUD or EVS in flight under IFR in an aircraft so equipped unless the aircraft has been approved for such flight as specified in this TS.

2. Head-up displays

(1) HUD may be used -

(a) to supplement conventional flight deck instrumentation; or

(b) as a primary flight display if certified for this purpose.

(2) An owner or operator who has been approved to use an HUD may -

(a) operate with reduced visibility or reduced RVR; or

(b) replace the guidance of certain ground facilities such as touchdown zone or centre line lights.

(3) The functions of an HUD may be provided by a suitable equivalent display: Provided that the appropriate airworthiness approval has been obtained for such a display.

(4) Ground training in the use of the HUD shall be accomplished at an approved training organisation (ATO). The training shall address all flight operations for which the HUD, or equivalent display is used.

(5) Flight training of at least two hours shall be accomplished using an aircraft or flight simulation training device (FSTD) equipped with the same type of HUD to be used in the aircraft. The training shall consist of normal, abnormal and emergency use of the equipment throughout all flight phases, a variety of take-off and approach conditions and shall include -

(a) pilot seat adjustment to attain and maintain appropriate viewing angles and verification of HUD operating modes;

(b) operations during critical flight events (ACAS TA/RA, upset and wind shear recovery, engine or system failure, etc.);

(c) crew co-ordination, monitoring and verbal call-out procedures for single HUD installations with head-down monitoring for pilot-not-equipped with HUD and head-up monitoring for pilot-equipped with HUD;

(d) crew co-ordination, monitoring and verbal call-out procedures for dual HUD installations with use of the HUD by the pilot flying the aircraft and either head-up or head-down monitoring by the other pilot; and

(e) use during low visibility operations, including taxi, take-off, instrument approach and landing in both day and night conditions. This training shall include the transition from head-down to head-up and head-up to head-down operations.

3. Vision systems

(1) Vision systems can display electronic real-time images of the actual external scene achieved through the use of image sensors such as. CVS, or display synthetic images, which are derived from the on-board avionics systems. Vision systems can also consist of a combination of these two systems, called combined vision systems. The information from vision systems may be displayed head-up or head-down. Such system may display electronic real-time images of the external scene using the EVS component of the system. Operational credit may be granted to vision systems which are appropriately qualified.

(2) Light emitting diode (LED) lights may not be visible to infrared-based vision systems. Operators of such vision systems must acquire information about the LED implementation programmes at aerodromes where they intend to operate.

(3) The use of EVS -

(a) shall allow the pilot to view an image of the external scene obscured by darkness or other visibility restrictions;

(b) shall allow acquisition of an image of the external scene earlier than with natural, unaided vision, hence providing for a smoother transition to references by natural vision;

(c) may improve situational awareness;

(d) may qualify for operational credit if the information from the vision system is presented to the pilots in a suitable way and the necessary airworthiness approval and specific approval from the Executive Director has been obtained for the combined system; and

(e) enable pilots to detect other aircraft on the ground, terrain or obstructions on or adjacent to runways or taxiways.

(4) For an operator who wishes to use EVS in IFR flight, EVS ground training shall be accomplished at an ATO or as part of an approved training programme. The programme shall include, as a minimum, the following-

(a) an understanding of the system characteristics and operational constraints;

(b) normal procedures, controls, modes and system adjustments;

(c) EVS limitations;

(d) failure modes of the EVS and the impact of the failure modes or limitations upon crew performance, in particular, for two-pilot operations; and

(e) any effects that weather, such as low ceilings and visibilities, may have on the performance of an EVS.

(5) For an operator who wishes to use EVS in IFR flight, flight training shall be accomplished using an aircraft or FSTD equipped with the same type of EVS to be used in the aircraft. The training shall consist of normal, abnormal and emergency use of the equipment throughout all flight phases, a variety of approaches and take-off conditions and shall include -

(a) enhanced vision display during low visibility operations, including taxi, take-off, instrument approach and landing and system use for instrument approach procedures in both day and night conditions;

(b) crew co-ordination and monitoring procedures and pilot call-out responsibilities;

(c) transition from enhanced imagery to visual conditions during the runway visual acquisition; and

(d) rejected landing due to loss of visual cues of the landing area, touchdown zone or rollout area.

4. HUD and vision systems approval

(1) For operations with an automatic landing system, an HUD or an equivalent display, a vision system or a hybrid system the following requirements shall be met:

(a) an operator shall obtain operational and airworthiness approval for the use of a HUD or EVS in IFR flight;

(b) for enhanced situational awareness, the installation and operational procedures shall ensure that EVS operations do not interfere with normal procedures or the operation or use of other aircraft systems;

(c) HUD or EVS, as applicable, installed in aircraft in the State of Manufacture shall meet the airworthiness requirements of such State. Provided an owner or operator can submit evidence of meeting the requirements of the State of Manufacture, airworthiness approval for the use of the HUD or EVS, as applicable, in that aircraft shall be given;

(d) prior to installing a HUD or EVS, as applicable, as a retrofit, an owner or operator shall contact the Authority to determine the airworthiness requirements associated with its approval for use;

(e) An airworthiness approval issued to an operator for an aircraft shall be valid for any other aircraft of the same type operated by such operator: Provided the HUD or EVS equipment, as applicable, is the same in each aircraft;

(f) an airworthiness approval issued to an aircraft type may be extended to other aircraft types: Provided the Executive Director is of the opinion that the other aircraft types have sufficient commonality with the approved aircraft and the HUD or EVS equipment, as applicable, is the same in all the aircraft;

(g) pilots shall pass a knowledge test following the ground training and a skills test following the flight training, both of which shall be administered by the operator or

an authorised person. Upon successful completion of the skills test, the operator shall record the candidate's qualification to operate with a HUD or EVS, as applicable, in his or her training records;

(h) annual recurrent training in the use of a HUD or EVS, as applicable, shall be accomplished; and

(i) systems that are not used for an operational credit or otherwise critical to the aerodrome operating minima, such as vision systems used to enhance situational awareness may be used without a specific approval. The standard operating procedures for these systems shall be specified in the operations manual.

(2) For operations with aeroplanes equipped with automatic landing systems, an HUD or equivalent displays, EVS, SVS or CVS, the classifications of instrument approach procedure shall not be affected.

Note: *Operational credit includes:*

(a) For the purpose of an approach ban, minima below the aerodrome operating minima;

(b) Reducing or satisfying the visibility requirements; or

(c) Requiring fewer ground facilities as compensated for by airborne capabilities.

(3) To obtain specific approval for operational credit, the vision systems compliance list shall include the information that is relevant to the specific approval requested and the registration marks of the aircraft involved. If more than one type of aircraft or fleet is included in a single application a completed compliance list shall be included for each aircraft or fleet. The following items shall be covered in a vision systems compliance list -

(a) reference documents used in compiling the submission for approval;

(b) flight manual;

(c) feedback and reporting of significant problems;

(d) requested operational credit and resulting aerodrome operating minima;

(e) operations manual entries including MEL and standard operating procedures;

(f) safety risk assessment;

(g) training programmes; and

(h) continuing airworthiness.

Note: *More detailed information and guidance on automatic landing systems, HUD or equivalent displays, EVS, SVS and CVS is contained in an AIC for All-Weather Operations.*

Note: *Guidance on safety risk assessments is contained in the AIC for SMS.*

135.08.33 OPERATIONS WITH ELECTRONIC FLIGHT BAGS

1. Introduction

(1) This TS provides guidance for the approval for use of installed and portable electronic flight bags (EFB).

(2) Installed EFBs may be incorporated during –

(a) an aeroplane type design;

(b) by a change to the type design; or

(c) if added by a STC.

(3) Portable EFBs are not considered to be part of the certified aeroplane configuration. They do not require airworthiness approval but do require an operational approval.

2. Airworthiness approval

(1) Portable EFBs that do not require airworthiness approval -

(a) are generally commercial-off-the-shelf (COTS)-based computer systems used for aircraft operations (e.g. laptop, tablet PC);

(b) are not attached to an aeroplane mounting device;

(c) are considered to be a controlled portable electronic device (PED);

Note - *A controlled PED is a PED that is subject to administrative control by the company. This will include, inter alia, tracking the location of the devices to specific aeroplanes or persons and ensuring that no unauthorised changes are made to the hardware, software or databases. A controlled PED will also be subject to procedures to ensure that it is maintained to the latest amendment state*.

(d) may only connect to aircraft power through a certified power source;

Note - *The EFB power source should be designed such that it may be deactivated at any time. Where there is no possibility for the flight crew to quickly remove or unplug the power to the EFB system, a clearly labelled and conspicuous means (e.g. on/off switch) should be provided. Circuit breakers are not to be used as switches; their use for this purpose is prohibited*.

(e) are normally without aeroplane data connectivity except under specific conditions; and

Notes - *Data connectivity of the EFB to other aeroplane systems is not authorised except if the EFB system is connected to -*

1. a system completely isolated from the avionics/aeroplane systems (e.g., EFB system connected to a transmission medium that receives and transmits data

for Aircraft Administrative Communications (AAC) purposes for usage on the ground only); and

2. *a certified data link to receive data only from aeroplane systems, where the data link, through the certification process, has an approved security device to protect the aeroplane systems from receiving any data from the EFB system and from the installation or use of unauthorised applications and data. Through the certification process, this data link should also have been demonstrated to protect the installed aeroplane systems from adverse effects due to EFB system failures. Subject to the above provisions, there is no further evaluation required when connecting the EFB system to the aeroplane data link port.*

(f) shall be secured during critical phases of flight.

(2) Even though portable EFBs do not require an airworthiness approval as they are "non-installed equipment", EMI demonstrations, batteries/power sources, data connectivity and rapid depressurisation shall be assessed if the Executive Director so determines.

(3) For EFBs other than those addressed in paragraph (1), the entire EFB, or some elements of the EFB, shall require an airworthiness approval. Elements to be subject to airworthiness approval are determined upon analysis of their interface with aeroplane systems and equipment. These EFBs shall be included as part of the minimum equipment list (MEL), if applicable.

(4) EFBs integrated into the aeroplane as part of its initial design or installed later as a retrofit in accordance with the requirements of the State of Manufacture shall be given approval: Provided the operator can submit evidence of having met the requirements of the State of Manufacture.

(5) For aeroplanes without the evidence specified in paragraph (4), an operator shall contact the NCAA to determine the airworthiness requirements associated with its approval for use prior to installing an EFB as a retrofit.

3. Operational approval

(1) An operator transitioning to a paperless flight deck (i.e., removal of charts, manuals, etc.) shall complete the requirements specified in paragraphs (2) to (6), inclusive, prior to operating with an EFB.

(2) Operational approval is contingent on the operator completing ground training for personnel using the EFB system. The programme shall include, as a minimum -

(a) an overview of the system architecture;

(b) pre-flight checks of the system;

(c) limitations of the system;

(d) the use of each operational function on the EFB;

(e) restrictions on the use of the system, including when some or all of the EFB functions are not available;

(f) the conditions, including phases of flight, under which the EFB should not be used;

(g) procedures for cross-checking data entry and computed information;

(h) human performance considerations on the use of the EFB; and

(i) additional training for new applications, new features of current applications or changes to the hardware configuration.

(3) EFB operations with no paper backup shall have a means of mitigation against the effects of a failure or malfunction of the EFB. Mitigation against EFB failure or impairment may be accomplished by a combination of -

(a) system design;

(b) separate and backup power sources for the EFB;

(c) redundant EFB applications hosted on different EFB platforms;

(d) paper products carried by selected crew members;

(e) complete set of paper backups on the flight deck; and/or

(f) procedural means.

(4) The operator shall assign responsibility for the administration and physical control of EFBs and the associated software; in particular, the activation of amendments to the hardware and software.

(5) The operator shall ensure that the EFB is protected from unauthorised intervention.

(6) The operator shall ensure that the EFB is maintained in accordance with the manufacturer's recommended programme. The operator shall establish procedures for action to be taken when an EFB is out of service unless provided for in a MEL.

(7) Prior to use of a portable EFB, an assessment shall be made of how the device will be used on the flight deck. Safe stowage, crashworthiness, security and use under normal environmental conditions, including turbulence, shall be addressed by the operator.

(8) Whether the EFB is portable or integrated with the aeroplane, the operator shall carry out an assessment of the human-machine interface and aspects of crew coordination when using the EFB. Whenever possible the EFB/user interface should be consistent with, but not necessarily identical to, the flight deck design philosophy. The assessment should include -

(a) general considerations including flight crew member workload, integration of the EFB into the flight deck, display and lighting ssues, system shutdown and system failures;

(b) physical placement issues, including stowage area, use of unsecured EFBs, design and placement of the mounting cradle;

(c) consideration of possible interference with aeroplane controls, outside vision, view of other flight deck displays, oxygen mask access, egress, crew cooling and speaker sound;

(d) software considerations, including ease of access to common and time-critical system functions, consistency of symbols, terms and abbreviations, legibility of text, system responsiveness, use of colour, display of system status, error messages, management of multiple applications and use of active regions;

(e) hardware considerations, including controls and input devices and flight crew accessibility to these devices; and

(f) application-specific considerations, including organisation and appearance of information, system detection of data entry errors and user interaction with applications.

(9) If an EFB generates information similar to that provided by existing flight deck systems, procedures should clearly identify -

(a) which information source will be primary;

(b) which source will be used for back-up information;

(c) under what conditions the back-up source will be used; and

(d) what actions will be taken when information provided by an EFB does not agree with that from other flight deck sources or, if more than one EFB is used, when one EFB disagrees with another.

(10) Upon receiving airworthiness approval and meeting the requirements of paragraphs (2) to (9), inclusive, the operator shall undergo a six-month self-evaluation period during which paper backups of the materials on the EFB shall be carried. The back-up paper materials shall be readily available to the flight crew members during flight time.

(11) If, following the six-month evaluation period, the operator is satisfied that the equipment and procedures are adequate and the crew members, maintenance personnel and other persons involved in the use of the EFB are sufficiently trained and knowledgeable, the operator shall submit a request to the NCAA seeking approval to use the EFB.

(12) The NCAA assessment of an application to use EFBs will be based upon -

(a) confirmation that the requirements of paragraphs (2) to (9), inclusive, have been met;

(b) a demonstration of system reliability and that information provided will not be inaccurate or misleading;

(c) that the operator has established a means to carry out quality assurance approval of data content prior to installation on the EFB; and

(d) satisfactory completion of a demonstration flight using the EFB.

(13) The authorisation to use EFBs shall contain any restrictions or limitations that the Executive Director deems necessary in the interests of safety.

(14) If the EFB provides electronic displays that replace paper products formerly required for safe flight operations or is a source for other required information or displays, operations of the EFB should be described in the operations manual.

(15) The EFB risk assessment to assess the risks associated with the use of each EFB function shall be done in accordance with Part 140 and be performed before the beginning of the approval process (if applicable) and its results shall be reviewed on a period basis.

(16) The EFB management system is responsible for hardware and software version and configuration management, maintenance of EFB security and integrity in accordance with documented policies and procedures and shall have an appropriately trained designate to be responsible for the system.

135.08.34 CARRY-ON BAGGAGE

1. Procedures for stowing of carry-on baggage

Procedures established by an operator to ensure that carry-on baggage is adequately and securely stowed shall take account of the following -

(a) each item carried in a cabin must be stowed only in a location that is capable of restraining it;

(b) mass limitations placarded on or adjacent to stowages shall not be exceeded;

(c) under-seat stowage areas shall not be used unless the seat is equipped with a restraint bar and the baggage is of such size that it may adequately be restrained by this equipment;

(d) items shall not be stowed in toilets or against bulkheads that are incapable of restraining articles against movement forwards, sideways or upwards and unless the bulkheads carry a placard specifying the greatest mass that may be placed there;

(e) baggage placed in lockers shall not be of such size that they prevent latched doors from being closed securely;

(f) baggage shall not be placed where it will impede access to emergency equipment; and

(g) checks shall be made before take-off, before landing and whenever the PIC illuminates the fasten seat belts sign, or otherwise so orders, to ensure that baggage is stowed where it cannot impede evacuation from the aircraft or cause injury by falling, or other movement, as may be appropriate to the phase of flight;

(h) all baggage which is required to be brought into the cabin area shall be of the size and weight as established by the operator.

135.08.38 BRIEFING OF PASSENGERS

1. Standard safety briefing

The standard safety briefing shall consist of an oral briefing provided by a crew member designated by the operator or by audio or audio visual means in at least the English language or as required by the Executive Director, which includes the following information as applicable to the aeroplane, equipment and operation -

Note - *The following briefing points presume the aeroplane is equipped with a PA system. Provided that the information is conveyed to each passenger at some point to cover each phase of flight, the associated information need not be communicated at the phase of flight indicated.*

(a) prior to take-off -

(i) when, where, why and how carry-on baggage is required to be stowed;

(ii) the fastening, unfastening, adjusting and general use of safety belts or safety harnesses;

(iii) when seat backs must be secured in the upright position and tray tables must be stowed;

(iv) the location and operation of emergency exits;

(v) the floor proximity emergency escape path lighting system if applicable;

(vi) the location, purpose of, and advisability of reading the safety features card;

(vii) the regulatory prohibition on smoking on board the aeroplane at any time;

(viii) the location of any emergency equipment the passenger may have a need for in an emergency situation such as the ELT, fire extinguisher, survival equipment, including the means to access it if in a locked compartment, first aid kits and life rafts;

(ix) the use of passenger operated portable electronic devices;

(x) on pressurised aeroplanes, the location and operation of the fixed passenger oxygen system, including the location and presentation of the masks; the actions to be performed by the passenger in order to obtain the mask, activate the flow of oxygen and correctly don and secure the mask; and

(xi) when carried on board, the location, use of and when to inflate life jackets, including how to remove them from stowage/packaging, and a demonstration of the method of donning and inflation;

(b) after take-off -

(i) that smoking is prohibited; and

(ii) the advisability of using safety-belts or safety harnesses during flight;

(c) in-flight when the "Fasten Seat Belt" sign has been turned on or other advice of the need to fasten safety harnesses for reasons of turbulence;

(d) prior to landing -

(i) carry-on baggage stowage requirements;

(ii) correct seat back and chair table positioning;

(iii) on flights scheduled for four hours duration or more, the location of emergency exits; and

(iv) the seat belt requirement; and

(e) after landing, prior to gate arrival -

(i) the need to remain seated with their seat belt fastened until the aeroplane comes to a full stop at the point of deplaning; and

(ii) the manner in which they will be assisted or guided to the safest direction and most hazard-free route for passenger movement away from the aeroplane following disembarkment.

Note - *The safety message of the briefing may not be diluted by the inclusion of any service information, advertising or non-related comments that would affect the integrity of the safety briefing.*

2. Individual safety briefing

The individual safety briefing shall include, as applicable to the situation -

(a) any information contained in the standard safety briefing and the safety features card that the passenger would not be able to receive during the normal conduct of that safety briefing; and

(b) additional information to the needs of that person as follows -

(i) the most appropriate brace position for that passenger in consideration of his/her condition, injury, stature and/or seat orientation and pitch;

(ii) the location to place any service animal that accompanies the passenger;

(iii) for a mobility-restricted passenger who needs assistance in moving expeditiously to an exit during an emergency -

(aa) a determination of what assistance the person would require to get to an exit;

(bb) the route to the most appropriate exit;

(cc) the most appropriate time to begin moving to that exit; and

(dd) a determination of the most appropriate manner of assisting the passenger;

(iv) for a visually impaired person -

(aa) detailed information of and facilitating a tactile familiarisation with the equipment that he/she may be required to use;

(bb) advising the person where to stow his/her cane if applicable;

(cc) the number of rows of seats between his/her seat and his/her closest exit and alternate exit;

(dd) an explanation of the features of the exits; and

(ee) if requested, a tactile familiarisation of the exit;

(v) for a comprehension-restricted person: while using the safety features card, pointing out the emergency exits and alternate exits to use and any equipment that he/she may be required to use;

(vi) for persons with a hearing impairment -

(aa) while using the safety features card, point out the emergency exits and alternate exits to use and any other equipment that the person may be required to use; and

(bb) communicating detailed information by pointing, face-to-face communication permitting speech reading, pen and paper, through an interpreter or through their attendant;

(vii) for a passenger who is responsible for another person on board, information pertinent to the needs of the other person, as applicable -

(aa) in the case of an infant -

(A) seat belt instructions;

(B) method of holding infant for take-off and landing;

(C) instructions pertaining to the use of a child restraint system;

(D) oxygen mask donning instructions;

(E) recommended brace position; and

(F) location and use of life preservers, as required;

(bb) in the case of any other person -

(A) oxygen mask-donning instructions;

(B) instructions pertaining to the use of a child restraint system; and

(C) evacuation responsibilities; and

(viii) for an unaccompanied minor, instructions to pay close attention to the normal safety briefing and to follow all instructions. A passenger that has been provided with an individual safety briefing need not be re-briefed following a change in crew if the crew member that provided the individual safety briefing has advised a member of the new crew of the contents of that briefing, including any information respecting the special needs of that passenger. A passenger may decline an individual safety briefing.

3. Passenger preparation for emergency landing

The emergency briefing provided in the event of an emergency where time and circumstances permit shall consist of instructions pertaining to -

(a) safety belts/safety harnesses;

(b) seat backs and chair tables;

(c) carry-on baggage;

(d) safety features cards;

(e) brace position (how to brace, when to assume position, how long to remain);

(f) if applicable, life preservers;

(g) location of exits;

(h) if applicable, evacuation procedures for an occupant of a child restraint system; and

(i) the removal of any other item that may cause harm to passengers during evacuation; i.e. sharp objects, high heeled shoes, pencils, etc.

135.08.39 SAFETY FEATURES CARD

The safety features card shall contain the following information as applicable to the aeroplane and equipment carried-

(a) general safety information including -

(i) smoking is prohibited on board the aeroplane;

(ii) each type of safety belt or safety harness installed for passenger use, including when to use, and how to fasten, tighten and release;

(iii) where carry-on baggage must be stowed for take-off and landing and any other related requirements and restrictions pertinent to that particular aeroplane; and

(iv) correct positioning of seat backs and chair tables for take-off and landing;

(b) emergency procedures and equipment including -

(i) fixed passenger oxygen system showing -

(aa) mask location and presentation; the actions to be performed by the seated passenger in order to obtain the mask, activate the flow of oxygen and correctly don and secure the mask; and

(bb) priority for persons assisting others with oxygen;

(ii) for aeroplanes where flight attendants are not required -

(aa) location of first aid kits;

(bb) location of fire extinguishers that would be accessible to the passengers;

(cc) location of ELTs; and

(dd) location of survival equipment and if the stowage compartment is locked, the means of access or location of the key;

(iii) passenger brace position for impact, as appropriate for each type of seat and restraint system installed for passenger use, including the brace position for an adult holding an infant;

(iv) the location, operation and method of using each emergency exit type on the aeroplane, including identification of those emergency exits known to be rendered unusable in a ditching or because of the aeroplane configuration such as a combi configuration;

(v) the safest direction and most hazard-free escape route for passenger movement away from the aeroplane following evacuation;

(vi) the attitude of the aeroplane while floating;

(vii) location of life jackets or equivalent individual flotation devices and correct procedures for removal from stowage/packaging; donning and use of the life jacket or equivalent individual flotation device for adult, child and infant users, including when to inflate;

(viii) location and use of life rafts;

(ix) location, removal and use of flotation devices; and

(x) the form, function, colour and location of any floor proximity emergency escape path lighting system that is installed; and

(c) the safety features card shall be applicable to the aeroplane being operated and shall contain only safety information that is -

(i) accurate for the aeroplane type and configuration in which it is carried and in respect of the equipment carried;

(ii) presented with clear separation between each instructional procedure. All actions required to complete a multi-action procedure to be presented in correct sequence and the sequence of actions to be clearly identified; and

(iii) depicted in a clear and distinct manner.

135.08.40 SEATS, SEAT SAFETY BELTS, HARNESSES AND CHILD RESTRAINT DEVICES AND CARRIAGE OF INFANTS

(1) An owner or an operator of an aircraft shall not operate the aircraft unless such aircraft is equipped, as applicable, for the carriage of infants with -

(a) An air service operator shall ensure that an infant is only carried when properly secured in the arms or on the lap of an adult passenger, or with a child restraint system or in a sky cot.

(b) A sky cot may be used provided that it –

(i) is restrained so as to prevent it from moving under the maximum accelerations to be expected in flight;

(ii) is fitted with a restraining device so as to ensure that an infant shall not be thrown from such sky cot under the maximum accelerations to be expected in flight.

(iii) may not be used during critical phases of flight

(iv) shall be positioned in such a way that they do not prevent or hinder the movement of adjacent passengers or block exits.

(c) A child restraint system may be used provided that –

(i) infants shall not be carried behind a bulkhead unless a child restraint device is used during critical phases of flight and during turbulence;

(ii) an infant may be seated in a car-type infant seat, provided that an infant's seat –

(aa) is secured to the aeroplane seat in accordance with the instructions provided with the child seat;

(bb) is designed to be secured to a passenger seat by means of a single lap strap and face the same direction as the passenger seat;

(cc) does not unreasonably extend beyond the forward position of the passenger seat cushion on which it rests;

(dd) is secured to the passenger seat at all times during flight, even when it is unoccupied by the child;

(ee) shall be removed from an aircraft in an emergency evacuation, and not the infant;

(ff) is positioned in such a way that it does not prevent or hinder the movement of adjacent passengers or block exits;

(gg) is not place in an aisle seat, depending on cabin configuration;

(hh) is used in accordance with infant weight limitations specified for such devices;

(iii) is fitted with a single release harness, which secures the infant's lap, torso and shoulders, but designed that the child can easily be secured in or removed from it; and

(iv) shall not be in the same row or row directly forward or aft of an overwing emergency exit; or in the same row as any other exit unless such exit and row are separated by a bulkhead.

(d) When an infant is carried in the arms or on the lap of an adult passenger –

(i) the seat belt, when required to be worn, shall be fastened around the passenger carrying or nursing the infant, but not around the infant; and

(ii) the name of the infant shall be bracketed on the passenger list with the name of the person carrying or nursing the infant.

135.09.1 GENERAL REQUIREMENTS

1. Performance data

(1) Operations Using Other than Approved Performance Data - Contaminated Runway

An operator may elect to use performance data from a source other than the aeroplane flight manual when operating an aeroplane to or from a contaminated runway: Provided -

(a) the aeroplane shall be operated in accordance with a contaminated runway operations supplement to the flight manual that has been prepared or approved by the aeroplane manufacturer;

(b) take-off mass limitations may be based on an engine-out condition using a 15-foot screen height, provided the area to be used for first segment climb contains no obstacles taller than 15 feet;

(c) where the manufacturer permits, stopping distance calculations may include credit for reverse thrust on the operative engine;

(d) operation at reduced thrust settings shall not be permitted and Vmc shall be based on full-rated thrust;

(e) the approved operations manual shall set out procedures for operations using contaminated runways; and

(f) pilot and, where applicable, flight operations officer ground training shall address contaminated runway operations.

(2) Operations Using Other than Approved Performance Data - Reciprocating-Engine Aeroplanes in Cargo-only Operations

An operator may elect to use performance data from a source other than the aeroplane flight manual when operating a reciprocating-engine aeroplane during cargo-only operations from or to unprepared surfaces (any naturally occurring surface used as a runway that has not been altered by man): Provided -

(a) the operator's approved operations manual sets out the programme for operations involving unprepared surfaces. The programme shall include -

(i) pilot-in-command training, checking and experience requirements, which shall include -

(aa) at least 100 hours on type;

(bb) completion of a course of ground and flight training covering topics such as take-off and landing surface characteristics, obstacle assessment and interpretation of pertinent aeroplane data;

(cc) completion of at least 25 hours of line induction involving unprepared surface operations; and

(dd) passing a line check covering unprepared surface operations;

(b) procedures for company operational approval for unprepared surface operations; and

(c) procedures for assessing and operating from/to unprepared surfaces and unfamiliar approach and departure routes.

2. Take-off mass limitations - accelerate-stop distance

An operator may operate a reciprocating-engine aeroplane where the accelerate-stop distance required exceeds the accelerate-stop distance available: Provided the operator restricts the aeroplane to no more than 9 passenger seats being occupied.

3. Net take-off flight path - visual obstacle avoidance

An operator may conduct a departure of an aeroplane without determining net take-off flight path for a reciprocating-engine aeroplane when visual obstacle avoidance is possible: Provided the following conditions are met -

(1) Obstacle Assessment -

(a) the operator shall obtain the best available data concerning obstacles in the proposed take-off path. Transient obstacles (such as construction equipment or moored watercraft, etc.) shall be considered when they are estimated to lie within 300 feet of the centreline of the proposed take-off path; and

(b) where the precise height, bearing and distance of an object is not known (such as objects depicted on a topographical map), the operator shall use a reasonable estimate for performance calculations. Calculations shall clearly indicate where estimated information is used;

(2) Departure Planning -

(a) the person responsible for operations or his/her delegate shall establish a company engine-out departure plan using procedures set out in the approved operations manual, including at least the following -

(i) obstacle assessment;

(ii) aeroplane performance, including turn radii; and

(iii) visual reference points to be used during the departure route;

(b) prior to commencing a take-off, the PIC shall, in consideration of the current winds, density altitude and aeroplane mass, satisfy himself or herself that the departure plan to be followed in the event of an engine failure on take-off avoids all obstacles in the departure path by either 35 feet vertically or 300 feet horizontally;

(c) in considering visual contact with the controlling obstacles during the departure phase, an operator shall establish to the satisfaction of the Executive Director that, taking into account flight deck angle and alterations in the field of view during turns, the flight crew will be able to maintain continuous visual contact with all significant obstacles located within the departure route; and

(d) the operator shall retain the departure plan for audit purposes.

135.11.1 REQUIREMENTS FOR QUALITY MANAGEMENT SYSTEM

1. Definitions

(1) Any word or expression to which a meaning has been assigned in the Act, or the Regulations, when used in this technical standard, the same meaning unless the context indicates otherwise.

2. Quality management system (QMS) requirements

(1) The QMS shall -

(a) ensure the adequacy of operational and maintenance activities in maintaining compliance with requirements, standards and operational procedures;

(b) specify the basic structure of the quality system applicable to the operation and be structured according to the size and complexity of the operation to be monitored; and

(c) as a minimum, include the following -

(i) objectives of the QA programme, which shall be -

(aa) written;

(bb) specific, measurable, attainable, realistic and time-based; and performance shall be measured and tracked;

Note - *The QA objectives are not simply related to safety goals but are also part of the strategic and business objectives of the organisation; for example, improve the turn-around time of the aircraft to 20 minutes on domestic flights without deviations from the standards.*

(ii) how the organisation intends meeting the provisions of the CAR;

(iii) how the operator will meet additional standards and operating procedures;

(iv) drawing up a quality policy statement;

(v) documentation, including manuals, reports, statistics and records required in support of the QA programme and how they are to be controlled;

(vi) quality processes and procedures to be employed in support of the QA programme;

(vii) monitoring process;

(viii) the procedures to be utilised in effecting the QA programme, including -

(aa) audit procedures;

(bb) reporting procedures; and

(cc) corrective action and verification procedures;

(ix) a system of record keeping; and

(x) a training syllabus.

3. QMS policy

(1) An air operator shall establish a formal, written quality policy statement, constituting a commitment by the chief executive officer as to what the quality system is intended to achieve. The quality policy shall -

(a) reflect the commitment to the goal of achieving and continuing with compliance with regulatory requirements together with any additional standards specified by the operator; and

(b) reflect the chief executive officer's commitment to -

(i) appoint resources to manage the system;

(ii) ensure the structure required to meet the goals is established and maintained;

(iii) establish measurable objectives; and

(iv) ensure continual improvement in the QMS.

4. Structure

(1) The chief executive officer shall appoint an accountable QM to manage the system and who meets the experience and qualifications requirements specified in CATS 135.06.2(6).

(2) The QM shall have direct link to the chief executive officer to discuss QMS matters when required.

(3) The roles and responsibilities of the QM and all other role players within the QMS shall be defined in

(4) QA audit responsibilities shall be performed and reported independent from all other line functions within the organisation, except as provided for in paragraph 7 below.

(5) The structure of the organisation may vary with the size and complexity of the operator but in all cases, the QMS should be developed so as to properly interface internally and with external agencies or service providers with which the company engages

5. Process requirements

(1) As processes are the means by which the QA goals are meant to be attained, they must be documented, whether written as procedures or mapped in flow chart format, for every significant activity and task within the organisation.

(2) The inputs, sequential steps and outputs must be shown, and where multiple individuals are involved, responsible for each output.

(3) Processes shall list -

(a) the references that must be consulted in using the process;

(b) the records that must be completed as evidence of the process having been followed; and

(c) the minimum retention periods for these documents as specified in the document and records control procedures.

(4) Processes which fall into the following categories of quality control must be -

(a) key/core business processes critical to the company's reason for existence. E.g. flight operations, ground operations, maintenance, safety management, etc.;

(b) support processes that are developed in support of the core processes, e.g. recruitment, procurement, etc.; and

(c) quality processes, like auditing, management review of the system, document control, records control, measurement of objectives, measurement of the ability of processes to achieve their intended results, customer satisfaction measurement, data analysis corrective action and preventive action.

6. Documentation

(1) Except as provided in paragraph (3), the QMS must be supported by a quality management manual (QMM) either as a part of the operations manual system or a stand-alone document, the contents of which shall include -

(a) the system of amendment and revision -

(i) the procedure for amending the manual, including temporary revisions;

(ii) who is responsible for the issuance and insertion of amendments and revisions;

(iii) a record of amendments and revisions with insertion dates and effective dates;

(iv) a description of the system for the annotation of pages and their effective dates;

(v) a list of effective pages; and

(vi) a description of the distribution system for the manual, amendments and revisions;

(b) the company's policy statement;

(c) the company's structure;

(d) the company's objectives;

(e) the roles, duties and responsibilities of the company's key personnel, including the chief executive officer and QM. Where there is more than one QM, the mandate and specific functions of each and the interrelationship between them must be clearly identified; and

(f) the procedures/processes whether written or mapped (some companies include only high level cross-departmental processes in the QMM and others include all processes in their QMM - they would end up with a series of manuals). Detailed manuals are normally the responsibility of the line managers but they still form part of the QMS and will fit into the QMS to meet requirements.

(2) In addition, the following documentation, usually residing in the QMM, shall be prepared and used within the QMS -

(a) forms and checklists that have to be used in the execution of the processes;

(b) a list of records used in the system;

(c) a list of forms used in the system;

(d) a list of registers or software systems in use as support to the system; and

(e) a list of external documents that impact on the system (called references).

7. Quality Manager

(1) In the case of small and very small operators, the post of the QM may be combined or outsourced subject to the approval of the Executive Director. However, in such event, independent personnel should conduct the quality inspections and audits.

(2) The specific duties and responsibilities of the QM will vary in relation to the size and complexity of the company but shall be identified in the QMM or other manual, if a separate QMM is not produced.

8. Quality Management System

(1) A QMS shall include a quality assurance programme that includes all planned and systematic actions necessary to provide confidence that all operations and maintenance are conducted in accordance with all applicable requirements, standards and operational procedures. A quality assurance programme should, at least, include the following -

(a) Inspections

The primary purpose of a quality inspection is to observe a particular event/action/document, etc., in order to verify whether established operational procedures and requirements are followed during the accomplishment of that event and whether the required standard is achieved. To the extent conducted by the operator, quality inspections shall include -

(i) flight operations;

(ii) ground de-icing/anti-icing;

(iii) flight support services;

(iv) load control;

(v) maintenance;

(vi) technical standards; and

(vii) training standard;

(b) Audits

(i) Audits shall include quality procedures and processes covering at least the following -

(aa) a statement explaining the scope of the audit;

(bb) planning and preparation;

(cc) gathering and recording evidence; and

(dd) analysis of the evidence; and

(ii) Audit techniques shall include -

(aa) interviews or discussions with personnel;

(bb) a review of published documents;

(cc) the examination of an adequate sample of records;

(dd) the witnessing of the activities which make up the operation; and

(ee) the preservation of documents and the recording of observations;

(c) Auditors

(i) Auditors should not have any day-to-day involvement in the area of the operation and/or maintenance activity which is to be audited. An operator may, in addition to using the services of full-time dedicated personnel belonging to a separate quality department, undertake the monitoring of specific areas or activities by the use of part-time or external auditors;

(ii) An operator whose structure and size does not justify the establishment of full-time auditors may undertake the audit function by the use of part-time personnel from within his or her own organisation or from an external source under the terms of an agreement acceptable to the Executive Director. In all cases, the operator should develop suitable procedures to ensure that persons directly responsible for the activities to be audited are not selected as part of the auditing team;

(iii) Where external auditors are used, it is essential that any external specialist is familiar with the type of operation or maintenance conducted by the operator;

(iv) The operator's quality assurance programme shall identify the experience levels of persons within the company responsible and authorised to -

(aa) perform quality inspections and audits as part of on-going quality assurance;

(bb) identify and record any concerns or findings, and the evidence necessary to substantiate such concerns or findings;

(cc) initiate or recommend solutions to concerns or findings through designated reporting channels;

(dd) verify the implementation of solutions within specific timescales; and

(ee) report directly to the QM;

(d) Audit Scope

Operators are required to monitor compliance with the operational procedures they have designed to ensure safe operations, airworthy aircraft, and the serviceability of both operational and safety equipment. In so doing, they should as a minimum and where appropriate, monitor the following -

(i) the organisation;

(ii) plans and company objectives;

(iii) operational procedures;

(iv) flight safety;

(v) operator certification (AOC/Operations Specifications);

(vi) supervision within the organisation;

(vii) aircraft performance;

(viii) all-weather operations;

(ix) communications and navigational equipment and practices;

(x) mass, balance and aircraft loading;

(xi) instruments and safety equipment;

(xii) manuals, logs and records;

(xiii) aircraft maintenance/operations interface;

(xiv) use of the MEL;

(xv) maintenance programmes and continued airworthiness;

(xvi) airworthiness directives management;

(xvii) maintenance accomplishment;

(xviii) defect deferral;

(xix) flight crew;

(xx) operational control personnel;

(xxi) dangerous goods;

(xxii) security;

(xxiii) training; and

(xxiv) safety management system.

(e) Audit Scheduling

A quality assurance programme shall include a defined audit schedule and a periodic review-cycle, area by area, with consideration being given to the following factors -

(i) the schedule should be flexible and allow unscheduled audits when trends are identified. An operator should establish a schedule of audits to be completed

during a specified calendar period. All aspects of the operation shall be reviewed within every period of 12 months in accordance with the programme unless an extension to the audit period is accepted by the Executive Director;

(ii) an operator may increase the frequency of audits at his or her discretion but shall not decrease the frequency unless accepted by the Executive Director. It is considered unlikely that an interval between audits greater than 24 months would be acceptable;

(iii) follow-up audits should be scheduled when necessary to verify that corrective action was carried out and that it was effective; and

(iv) the operator's defined audit schedule can be affected by significant changes to the management, organisation, operation or technologies, as well as changes to the regulatory requirements, resulting in the requirement for an ad hoc audit.

(f) Monitoring

(i) The aim of monitoring within the quality system is to investigate and judge its effectiveness and thereby to ensure that defined policy and operational and maintenance standards are continuously complied with. Monitoring activity is based upon quality inspections, audits, corrective action and follow-up; and

(ii) The operator shall establish and publish a procedure to monitor regulatory compliance on a continuing basis. This monitoring activity shall be aimed at eliminating the causes of unsatisfactory performance;

(g) Corrective Action

The quality assurance programme shall include procedures to ensure that corrective actions are taken in response to findings. These quality procedures should result in the monitoring of such actions to verify their effectiveness as having been rectified. The procedures and responsibilities associated with a corrective action programme are -

(i) subsequent to the quality inspection/audit, the operator shall establish -

(aa) the seriousness of any findings and any need for immediate corrective action;

(bb) the origin of the finding;

(cc) which corrective actions are required to ensure that the non-compliance does not recur;

(dd) a schedule for corrective action;

(ee) the identification of individuals or departments responsible for implementing corrective action; and

(ff) allocation of resources by the chief executive officer, where appropriate; and

(ii) the QM shall -

(aa) verify that corrective action is taken by the manager responsible in response to any finding of non-compliance;

(bb) verify that corrective action includes the elements outlined in paragraph (1)(g)(i) above;

(cc) monitor the implementation and completion of corrective action;

(dd) provide management with an independent assessment of corrective action, implementation and completion; and

(ee) evaluate the effectiveness of corrective action through the follow-up process;

(h) Follow-up

Follow-up is a mandatory part of the QA process to ensure that each finding of non-compliance has been resolved satisfactorily and that the resultant solution is effectively implemented, such that a re-occurrence of the situation leading to the non-compliance is not or is highly unlikely to recur. Follow-up requires at least an inspection of the area identified as being non-compliant but may require a more in-depth audit to ensure a satisfactory resolution of the issue.

(i) Management Evaluation

Management evaluation is a comprehensive, systematic, documented review by the management of the quality system, operational policies and procedures and should include the following -

(i) the results of quality inspections, audits and any other indicators;

(ii) the overall effectiveness of the management organisation in achieving stated objectives;

(iii) consideration of conclusions and recommendations made as a result of an evaluation submitted in writing to the responsible manager for action; and

(iv) the frequency, format and structure of internal management evaluation activities;

(j) Records

The operator shall maintain accurate, complete and readily accessible records documenting the results of the quality assurance programme. The following records shall be retained for a period of at least five years -

(i) audit schedules;

(ii) quality inspection and audit reports;

(iii) responses to findings;

(iv) corrective-action reports;

(v) follow-up and closure reports; and

(vi) management evaluation reports.

(2) An operator may decide to sub-contract out certain activities to external agencies for the provision of services. The quality assurance programme shall include an examination of such sub-contractors and considerations with respect to sub-contracting are –

(a) a sub-contract may be issued as follows –

(i) ground de-icing or anti-icing;

(ii) maintenance;

(iii) ground handling;

(iv) flight support, including performance calculations, flight planning, navigation database and dispatch and flight following;

(v) training; and

(vi) manual preparation; and

(vii) an operator shall develop policies and procedures for third parties that perform work on its behalf.

(3) Operators operating five (5) or less aircraft of the same type category or three (3) or less aircraft of different type categories, may consider the following when establishing a QA programme, provided that the Executive Director may require operators to implement a more advanced QA programme, based on routes and/or frequency operated -

(a) Operators would tailor their quality systems to suit the size and complexity of their operation and allocate resources accordingly.

(b) it may be appropriate to develop a quality assurance programme that employs a checklist. The checklist should have a supporting schedule that requires completion of all checklist items within a specified timescale, together with a statement acknowledging completion of a periodic review by top management. An occasional independent review of the checklist content and achievement of the quality assurance should be undertaken; and

(c) the operator may decide to use internal or external auditors or a combination of the two. In these circumstances it would be acceptable for external specialists and/or qualified organisations to perform the quality audits on behalf of the quality

manager. If the independent quality audit function is being conducted by external auditors, the audit schedule should be shown in the relevant documentation.

(4) A QA programme shall include a training programme that provides the following -

(a) for those responsible for managing the quality system, receive training covering at least -

(i) an introduction to the concept of the quality system;

(ii) quality management;

(iii) the concept of quality assurance;

(iv) quality manuals;

(v) audit techniques;

(vi) reporting and recording; and

(vii) the way in which the quality system will function in the organisation;

(b) for those involved in the inspection or audit functions, training covering at least -

(i) an introduction to the concept of the quality system;

(ii) the concept of quality assurance;

(iii) reporting and recording; and

(iv) audit techniques; and

(c) a briefing to the remainder of the employees consisting of background information about the QA programme and their role in maximising safety and efficiency in the organisation. The allocation of time and resources should be governed by the size and complexity of the operation concerned.