SOUTH AFRICAN CIVIL AVIATION AUTHORITY

CIVIL AVIATION ACT, 2009 (ACT NO. 13 OF 2009)

AMENDMENT SA-CATS 2 of 2025

The Director of Civil Aviation has, in terms of section 163 (1) of the Civil Aviation Act, 2009 (Act No. 13 of 2009) amended South African Civil Aviation Technical Standards as reflected in the Schedule hereto. The Amendments as contained in the Schedule shall come into operation on the date of publication.

Poppy Khoza
Director of Civil Aviation
Date: 19 JUN 2025

GENERAL EXPLANATORY NOTE:

[ ] Words in bold type in square brackets indicate omissions from existing technical standards.

_____ Words underlined with a solid line indicate insertions in existing technical standards.

SCHEDULE

Table of contents

(d) Substitution in technical standard 64.01.9 for sections 10 and 11

(e) Substitution in technical standard 64.01.9 section 13, subsection (1)

(f) Substitution in technical standard 64.01.9 for sections 14 and 15

(g) Substitution in technical standard 64.01.10

(h) Deletion of technical standards 64.01.11 and 64.01.12

(i) Substitution for technical standard 64.02.2

(j) Substitution of technical standard 64.02.3

(k) Substitution of Technical Standard 64.02.4

4. Amendment of Document SA-CATS 66

(a) Substitution of technical standard 66.01.9

5. Amendment of Document SA-CATS 67

(a) Substitution of Schedule 14

(b) Substitution of Schedule 21

(c) Deletion of section 6 in Schedule 31

(d) Insertion of Schedule 31A

(e) Substitution for Schedule 36

(f) Substitution for Schedule 37

(g) Insertion of Schedule of 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, and 65

(h) Substitution of technical standard 67.00.4 of section 3.5

(i) insertion in technical standard 67.00.4 of section 5A

(j) Substitution in technical standard 67.00.9 for Table A1

6. Amendment of Document SA CATS 91

(a) Substitution of technical standard 91.07.33

7. Amendment of Document SA-CATS 93

(a) Substitution of technical standard 93.07.13

(b) Substitution of technical Standard 93.07.23

8. Amendment of Document SA-CATS 121

(a) 121.02.13 section 1

(b) 121.02.13 sections 2 and 3

(c) 121.07.13 section 6

(d) 121.07.31

9. Amendment of Document SA-CATS 135

(a) 135.02.9

(b) 135.07.13

(c) 135.02.29

10. Amendment of Document SA-CATS 139

(a) insertion of definitions and abbreviations

(b) insertion of TS 139.02.2 and 139.02.3

(c) 139.02.10

(d) 139.02.11

(e) 139.02.15

(f) 139.02.19

(g) 139.02.36

(h) 139.03.02

11. Amendment of Document SA-CATS 140

(a) substitution of SA-CATS 140

12. Amendment of Document SA-CATS 171

(a) Amendment of TS 171.01.1

13. Amendment of Document SA-CATS 172

(a) insertion of Annexure F

14. Amendment of Document SA-CATS 173

(a) substitution in technical standard 173.01.5

(b) substitution in technical standard 173.01.14 for subsection (1)

(c) substitution in technical standard 173.02.2 for section 4 (1) (b) and (c)

(d) substitution in technical standard 173.03.1 section 1 for subsection (1)

(e) substitution for technical standard 173.03.2

(f) deletion of technical standard 173.03.3

15. Amendment of Document SA-CATS 175

(a) substitution in technical standard 175.03.4 section 6 for subsection (3)

(b) substitution in technical Standard 175.03.4 section 6 after subsection (9)

AMENDMENT OF SA-CATS 43

1. Document SA-CATS 43 is hereby amended by:

(a) the substitution in technical standard 43.02.5 for section 2 of the following section 2:

"**2. Overhaul of components and installed equipment**

The overhaul of all components and items of equipment installed on an aircraft must be executed at such times as is **[recommended]** required by the manufacturer, or as stipulated in the approved AMP. Where there is no manufacturer's instructions or **[recommendations]** requirement have been issued, such components or equipment must be overhauled as and when their condition show that it is necessary or as per approved AMP to keep the aircraft serviceable. The work involved must be executed in accordance with good aeronautical practices and procedures.";

(b) the deletion in technical standard 43.02.5 for section 3;

"**[3. Engine overhauls**

(1) The engine overhauls specified in Appendix 1 are mandatory for all aircraft that are operated in terms of an air service license or is utilized for the provision for "hire and fly" and flying training (other than the training of its registered owner). The following is also applicable to piston engines – all components (Class II) specified in the engine type certificate, such as the ignition system, the fuel system, and (when fitted) the turbo charging system, must either be overhauled concurrently with the engine, unless the manufacturer or the Director has directed otherwise, or be substituted by an identical, serviceable item. The engine must then be tested as one unit on a test bench or in an airframe with a calibrated instrument test panel and, if necessary, a test club and engine baffles in accordance with the manufacturer's laid down procedures and prior to the overhaul being certified as a complete unit.

(2) Aircraft that are not utilized in the disciplines as mentioned in (1), that are fitted with Textron Lycoming or Teledyne Continental reciprocating aircraft engines that have reached a 12 year calendar life, but not exceeded the hourly limitation imposed, shall carry out the following requirements to ensure continued compliance with the airworthiness standards for the engine –

(a) All such engines, which have not been overhauled for the past 12 years or more, or upon reaching the 12 years calendar life period, shall be inspected and all AMO's shall record this in the relevant log book. This entry shall state that all instructions for Continuing Airworthiness (ICA) requirements (Certified Requirements and AD's)

have been complied with.

(b) The engine must be inspected for defects and blow-by and a borescope inspection carried out on all cylinders. The borescope inspection must be repeated every two years. The blow-by and borescope inspection must be within acceptable limits and certified as such in the applicable log book. The engine must conform to all relevant Airworthiness Directives.

(c) All fuel carrying lines and oil leaks must be investigated and rectified where necessary. Seals and hoses requiring replacement are to be replaced.

(d) Engine mounted components and accessories requiring overhaul at the same hourly or calendar intervals as the engine, shall be overhauled at the same time as the engine, unless otherwise specified by the component accessory manufacturer, whichever is the shortest period.

(4) An engine shall be completely overhauled together with all components specified in the engine type certificate such as but not limited to components of the fuel system, the ignition system and (if applicable) the turbo charging system –

(a) where the engine has been subjected to significant external heat, e.g. fire;

(b) where the engine has been submerged in water;

(c) when the engine has suffered substantial damage;

(d) where no historical records for the engine can be found.

(5) In cases where the engine has been struck by lightning and there are witness marks on the propeller the manufacturer's recommendations must be complied with.]"*;*

(c) the substitution in technical standard 43.02.8, Section A, subsection (3) paragraph (a), (b), (e) for subparagraph(i) and (ii) item (cc), and (j):

"**3. Associated documents**

(a) During the maintenance of aircraft due regard must be given to –

(i) the contents, **[recommendations]** or requirements of the relevant, IPCs, ADs, SBs, SLs, SIs or other similar technical information produced by the manufacturers of the airframe, engine, propeller and installed equipment; and

(ii) additional requirements issued by the Director, including those contained in Aeronautical Information Circulars and Maintenance Advisory Notices, and in any publications, issued by the State of manufacture or State of type design of the aircraft, which may prescribe or amplify techniques to be followed in the maintenance of aircraft **[: e.g. British Civil Aircraft Inspection Procedures and United States of America Federal Aviation Administration handbooks AC-43-13-1 (Acceptable Methods, Techniques and Practices) and AC-43-13-2 (Acceptable methods Techniques and Practices – Aircraft Alterations) or their successor publications]**.

(b) All relevant information and requirements referred to in subsection (1) must be either contained in, listed, or otherwise associated with the checklist required to be used in terms of section 2 **[(3)(b)(ii)(aa)]** for each specific aircraft.

(c) The registered owner or **[air service]** operator of an aircraft shall ensure that a control system is in place ensuring that the requirements of all applicable Ads, as well as any SBs, SLs, Sis or other service information are reviewed, and those that are classified as mandatory, are complied with as specified in each directive before the aircraft is released to service. Where such instruction requires the update of technical data, the update shall be implemented, where applicable.

(i) "Mandatory" in this context means –

(aa) the airworthiness directives (AD) **[is]** are issued either by the Director or by the appropriate authority of the State of the type certificate holder;

(bb) any SB, SL, SI or other service information classified by the Director as mandatory, shall be complied with in respect of an aircraft, including its components or part; and

[(cc) any SB, SL, SI or other service information classified by the manufacturer as mandatory, shall be complied with in respect of an aircraft, including its components or parts, that is operated in terms of " and flying training (other than the training of its registered owner).]

[(ii) In respect of an aircraft that is not used for the provision of a commercial air transport operation or in flying training (other than for the training of its registered owner), compliance with any SB, SL, SI or other service information, issued by a manufacturer, shall be at the discretion

of the aircraft's owner – in conjunction with an AMO. Whenever an owner, decides not to comply with a particular SB, SL, SI or other service information, issued by a manufacturer in respect of his or her aircraft, this shall be recorded in the appropriate logbook as "SB (etc.) No. NOT COMPLIED WITH]";

(d) Where applicable in terms of subsection (5)(b)(ii), modifications and special inspections, **[classified by a manufacturer as mandatory]** shall be carried out in accordance with the manufacturer's instructions not later than the time or date specified by them, but in the event of any difficulties in complying therewith, the provisions of subsection (7) above shall apply with the necessary changes.";

(d) the substitution in technical standard 43.02.8, Section D, Part 1, subsection 4, paragraph (6):

"(6) **[The]** An AMO responsible for the maintenance of the aircraft, to which this programme relates, **[will draw up a]** will draw up a status report to ensure compliance with **[–aircraft maintenance programme (AMP) to ensure compliance with] –**

(a) all information issued by the manufacturers of the aircraft, its engines, propellers, instruments and installed equipment relating to the maintenance, inspection, repair, replacement, modification and overhaul of these items; and

(b) any requirements, including those contained in Airworthiness Directives and such SBs, SLs and SIs classified mandatory by **[the manufacturer or]** the Director, and Aeronautical Information Circulars (AICs), issued by the Director**[; and]**

[(c) the Civil Aviation Regulations, 2011. In the unlikely event of the aircraft is not utilised in commercial air transport operations or for the provision of flight training, the provision of section 3(5)(c) in section A of Technical Standard 43.02.B applies.]";

(e) the substitution in technical standard 43.02.8 in Section D, Part 1, section 6, subsection (5):

"(5) The record specified in paragraph (4) **[above]**, shall include a section to indicate

compliance with any recurring AD's, manufacturer's **[mandatory]** requirements, such as SB's, SI's and SL's, and applicable structural integrity inspections (SID), corrosion prevention control programme (CPCP), or any other requirement called out in a maintenance planning document (MPD). See also section 3(5)(d) of Section A of Technical Standard 43.02.8.";

(f) the deletion and substitution in technical standard 43.02.8 in Section D, Part 4, paragraphs (2), (3) and (8):

"(2) [**The]** A registered owner or an air service operator shall ensure that a system is in place ensuring that the requirements of all applicable ADs, as well as any SBs, SLs, SIs or other service information are reviewed, and those that are classified by the **[manufacturer]** Director as mandatory, are complied with as specified in each directive. Where such instruction requires the update of technical data, the update shall be implemented, where applicable

(3) "Mandatory" in this context means:

(a) the airworthiness directive (AD) is issued by either the Director or by the appropriate authority of the State of the type certificate holder;

(b) an instruction that a SB, SL, SI or other service information, classified by the Director as mandatory, shall be complied with in respect of an aircraft, including its components or parts.

[(c) in respect of an aircraft, including its components or parts, operated in terms of an air service licence or utilised for the provision of flying training (other than the training of its registered owner), any SB, SL, SI or other service information classified by the manufacturer as mandatory);

(d) in respect of aircraft that are not used for the provision of a commercial air transport operation or in flying training (other than for the training of its registered owner), compliance with any SB, SL, SI or other service information, issued by a manufacturer, shall be at the discretion of the aircraft's owner; whenever an owner – in conjunction with an AMO, decides not to comply with a particular SB, SL, SI or other service information, issued by a manufacturer in respect of his or her aircraft, this shall be recorded in the appropriate logbook as SB (etc.) No. .... NOT COMPLIED WITH.]

(8) All modifications and special inspections classified by the [**manufacturers]** Director as mandatory shall be carried out in accordance with the manufacturer's instructions not later than the time or date specified by them, but in the event of any difficulties in complying therewith, the provisions of subsection 5 above shall apply with the necessary changes.";

(g) the deletion and substitution in technical standard 43.02.8, Section H, Part 2, section 2, subsection (9):

"(9) **[The AMO responsible for the maintenance of the aircraft to which this Programme relates, shall ensure that it complies with the following requirement]** An AMO responsible for the maintenance of an aircraft, to which this programme relates, shall draw up a status report to ensure compliance **[with –aircraft maintenance programme (AMP) to ensure compliance with]** –

(a) all information issued by the manufacturers of the aircraft, its engines, rotor, instruments and installed equipment relating to the maintenance, inspection, repair, replacement, modification and overhaul of these items;

(b) any requirements, including those contained in Airworthiness Directives and such SBs, SLs and SIs classified mandatory by **[the manufacturer or]** the Director, and Aeronautical Information Circulars (AICs), issued by the Director; and

(c) the Civil Aviation Regulations.";

(h) the deletion and substitution in technical standard 43.02.8 in Section H, Part 7, paragraphs (2) and (3):

(2) **[The]** A registered owner or operator shall ensure that a system is in place ensuring that the requirements of all applicable ADs, as well as any SBs, SLs, SIs or other service information classified by the **[manufacturer]** Director as mandatory, are complied with as specified in each directive before an aircraft is released to service.

(3) "Mandatory" in this context means:

(a) the airworthiness directive (AD) is issued by either the Director or by the appropriate authority of the State of the type certificate holder;

(b) an instruction that a SB, SL, SI or other service information, classified by the Director as mandatory, shall be complied with in respect of an aircraft, including its components or parts.

[(c) in respect of an aircraft, including its components or parts, operated in terms of an air service licence or utilised for the provision of flying training (other than the training of its registered owner), any SB, SL, SI or other service information enhancing the safety of the aircraft (whether classified by the manufacturer as mandatory or not);

(d) in respect of aircraft that are not used for the provision of a commercial air transport operation or in flying training (other than for the training of its registered owner), compliance with any SB, SL, SI or other service information, issued by a manufacturer, shall be at the discretion of the aircraft's owner; whenever an owner – in conjunction with an AMO, decides not to comply with a particular SB, SL, SI or other service information, issued by a manufacturer in respect of his or her aircraft, this shall be recorded in the appropriate logbook as "SB (etc.) No. .... NOT COMPLIED WITH.]";

(i) the substitution in standard 43.02.8 in Section I, Part 1, subsection 4, paragraph (6):

"(6) **[The]** An AMO responsible for the maintenance of the aircraft, to which this programme relates, will draw up a status report to ensure compliance with –

(a) all information issued by the manufacturers of the aircraft, its engines, propellers, instruments and installed equipment relating to the maintenance, inspection, repair, replacement, modification and overhaul of these items; and

(b) any requirements, including those contained in Airworthiness Directives and such SBs, SLs and SIs classified mandatory by **[the manufacturer or]** the Director, and Aeronautical Information Circulars (AICs), issued by the Director **[; and**

(c) the Civil Aviation Regulations.

In the event of the aircraft is not utilised in commercial air transport operations or for the provision of flight training, the provision of section 3(5)(c) in Section A of Technical Standard 43.02.8 applies.]";

(j) the substitution in technical standard 43.02.8 in Section I, Part 1, subsection 6, paragraph

(5):

"(5) The record specified in paragraph (4) above, shall include a section to indicate compliance with any recurring AD's, manufacturer's **[mandatory]** requirements, such as SB's, SI's and SL's, and applicable structural integrity inspections (SID), corrosion prevention control programme (CPCP), or any other requirement called out in a maintenance planning document (MPD). See also section 3(5)(d) of Section A of Technical Standard 43.02.8.";

(k) the substitution in technical 43.02.8 in Section I, Part 1, subsection 14, paragraph (1):

"(1) During the maintenance of **[the]** an aircraft to which this programme applies, due regard shall be given to:

(a) the contents, recommendations or requirements of the relevant manuals, SBs. SLs, SIs or other similar technical information produced by the manufacturer and, where applicable, the engine, propeller and installed equipment; and

(b) additional requirements issued by the Director, including those contained in SACATS 43, AICs and in any publication issued by the authorities of the country of the type certificate holder that may prescribe or amplify techniques to be followed in the maintenance of aircraft**,[such as but not limited to British Civil Aircraft Inspection Procedures and United States of America Federal Aviation Administration (FAA) handbooks AC. 43.13-1 (Acceptable Methods, Techniques and Practices – Aircraft Alternations),]** or their successor publications, Ageing Aircraft Programme, Corrosion Prevention Control Programme, and the Aircraft's Structural Repair Manual (SRM).";

(l) the deletion and substitution in technical standard 43.02.8 in Section I, Part 4, paragraphs (2), (3) and (8):

"(2**) [The]** A registered owner or operator of an aircraft shall ensure that a system is in place ensuring that the requirements of all applicable AD's, as well as any SB's, SL's, SI's or other service information classified by the **[manufacturer]** Director as mandatory, are complied with as specified in each directive before an aircraft is released to service.

(3) "Mandatory" in this context means:

(a) the airworthiness directive (AD) is issued by either the Director or by the

appropriate authority of the State of the type certificate holder;

(b) an instruction that **[a]** an SB, SL, SI or other service information, classified by the Director as mandatory, shall be complied with in respect of an aircraft, including its components or parts.

[(c) in respect of an aircraft, including its components or parts, operated in terms of an air service licence or utilised for the provision of flying training (other than the training of its registered owner), any SB, SL, SI or other service information enhancing the safety of the aircraft (whether classified by the manufacturer as mandatory or not) must be consulted to determine if adequate procedures exist to ensure that safety is not jeopardized.]

(8) All modifications and special inspections classified by the **[manufacturers]** Director as mandatory shall be carried out in accordance with the manufacturer's instructions not later than the time or date specified by them, but in the event of any difficulties in complying therewith, the provisions of subsection (5) above shall apply with the necessary changes.".

AMENDMENT OF SA-CATS 61

2. Document SA-CATS 61 is hereby amended by:

(a) the substitution for Appendix 3.0 of the following Appendix:

"**Appendix 3.0**

1. SA CATS FCL 61

1.1 Appendix 3.0 provides requirements for the different types of integrated training courses for the issuance of a CPL and an ATPL, with and without IR.

1.2 This course is designed to ensure continuous learning in a supervised and authorised manner under Part 141. The integrated learning, together with a high standard of instruction and high-quality training equipment, allows for less flight training than the traditional modular approach, which is approved by the Director.

1.3 The duration of the course shall be a minimum of 12 months and a maximum of 36 months. Under exceptional circumstances and upon written application to the Director, approval may be granted to extend the course beyond 36 months provided that additional flying training or ground instruction is provided by Part 141.

1.4 An applicant may be admitted to training either as an *ab initio* entrant or as a holder of a PPL(A) or PPL(H) issued in accordance with Document SA-CATS 61 or by another contracting state. In the case of a PPL(A) or PPL(H) entrant, 50% of the hours flown prior to the course may be credited, up to a maximum of 40 hours of flying experience, or 45 hours if an aeroplane night rating has been obtained, of which up to 20 hours may count towards the requirement for dual instruction flight time.

1.5 An applicant wishing to transfer to another ATO during a course of integrated training shall apply in writing to the Director for an assessment of the further hours of training required at another ATO.

2. ATPL integrated course – Aeroplane

2.1 GENERAL

2.1.1 The aim of the ATPL(A) integrated course is to train a pilot to the level of proficiency necessary to enable him or her to operate as a co-pilot on a multi-pilot multi-engine aeroplane in commercial air transport and to obtain the CPL(A) with IR.

2.1.2 An applicant wishing to undertake an ATPL(A) integrated course shall complete all the instructional stages in one continuous course of training as arranged by an ATO.

2.1.3 The course shall comprise of the following:

(a) theoretical knowledge instruction to the ATPL(A) knowledge level;

(b) visual and instrument flying training; and

(c) raining in Multicrew Cooperation (MCC) for the operation of a multi-pilot aeroplane.

(d) An applicant failing or being unable to complete the entire ATP(A) course may apply to the Director for the theoretical knowledge examination credits in accordance with Technical Standard 61.01.10.

2.2 THEORETICAL KNOWLEDGE

2.2.1 An ATP(A) theoretical knowledge course shall comprise of at least 750 hours of instruction, directed study and exercises.

2.2.2 The MCC course shall comprise of at least 25 hours of theoretical knowledge instruction and exercises.

2.3 THEORETICAL KNOWLEDGE EXAMINATION

2.3.1 An applicant shall demonstrate the level of knowledge appropriate to the privileges of a holder of an ATPL (A), in accordance with the requirements of Technical Standard 61.01.10 and the detailed syllabus is contained in Appendix 2 of Document SA-CATS 61.

2.4 FLYING TRAINING

2.4.1 The flying training, not including type rating training, shall comprise a total of at least 195 hours, including all progress tests, of which up to 55 hours for the entire course may be instrument ground time.

2.4.2 Within the total of 195 hours, an applicant shall complete at least−

(a) 95 hours of dual instruction of which up to 55 hours may be instrument ground time; and

(b) 70 hours of flight time as PIC of which 55 hours may be SPIC, including a minimum of−

(i) 50 hours of cross-country flight as PIC, including one VFR cross-country flight of at least 540km (300 NM), in the course of which full-stop landings at two aerodromes different from the aerodrome of departure shall be made; and

(ii) 5 hours by night of which at least 3 hours shall be cross-country

time by night.

(c) 75 hours of instrument time, which may comprise instrument flight time and instrument ground time, including−

(i) compliance with Regulation 61.11.2(6) for the issuance of a multi-engine instrument flying rating; and

(ii) 15 hours of MCC for which an approved FSTD may be used.

(d) Five hours of instruction in an aeroplane with adjustable flaps, retractable undercarriage and variable pitch propeller or turbojet engine.

2.5 FLYING INSTRUCTION PHASES

2.5.1 The flying instruction is divided into six (6) phases.

(1) Phase 1

(a) Exercises up to the first solo flight comprise a total of at least 10 hours of dual flight instruction on a single-engine aeroplane including –

(i) pre-flight operations, mass and balance determination, aeroplane inspection and servicing;

(ii) aerodrome and traffic pattern operations, collision avoidance and precautions;

(iii) control of the aeroplane by external visual references;

(iv) normal take-offs and landings;

(v) flight at critically slow airspeeds, recognition of and recovery from incipient and full stalls, spin avoidance; and

(vi) unusual attitudes and simulated engine failure.

(2) Phase 2

(a) Exercises up to the first solo cross-country flight comprise of a total of at least 10 hours of dual flight instruction and at least 10 hours of solo flight including –

(i) maximum performance short field and obstacle clearance take-offs or short field landings;

(ii) flight by reference solely to instruments including the completion of a 180° turn;

(iii) dual cross-country flying using external visual references, dead-reckoning and radio navigation aids and diversion procedures;

(iv) aerodrome and traffic pattern operations at different aerodromes;

(v) crosswind take-offs and landings;

(vi) non-normal and emergency procedures and manoeuvres, including simulated aeroplane equipment malfunctions;

(vii) operations to, from and transiting controlled aerodromes, compliance with air traffic services procedures, radio telephony procedures and phraseology; and

(viii) knowledge of meteorological briefing arrangements, evaluation of weather conditions for flight and use of Aeronautical Information Services (AIS).

(3) Phase 3

(a) Exercises up to the VFR navigation progress test comprise of a total of at least 5 hours of dual instruction and at least 40 hours as PIC.

(b) The dual instruction and testing up to the VFR navigation progress test shall comprise of the following:

(i) repetition of exercises of Phases 1 and 2;

(ii) VFR flight at relatively critical high airspeeds, recognition of and recovery from spiral dives; and

(iii) VFR navigation progress test, conducted by a flight instructor who did not participate in the applicant's training.

(4) Phase 4

(a) Exercises up to the instrument rating skill test comprise of the following:

(i) at least 55 hours of instrument time which may contain up to 25 hours of instrument ground time in an approved FNPT I equivalent or up to 40 hours in an approved FNPT II or higher, which shall be conducted by a flight instructor or an authorised FSTD instructor;

(ii) at least 15 hours of instrument time flown as SPIC;

(iii) night flight including take-offs and landings as PIC;

(iv) pre-flight procedures for IFR flights including the use of the flight manual and appropriate air traffic services documents in the preparation of an IFR flight plan;

(v) procedures and manoeuvres for IFR operation under normal, abnormal and emergency conditions covering at least –

(aa) the transition from visual to instrument flight on take-off;

(bb) standard instrument departures and arrivals;

(cc) en route IFR procedures;

(dd) holding procedures;

(ee) instrument approaches to specified minima;

(ff) missed approach procedures;

(gg) landings from instrument approaches including circling;

(hh) in-flight manoeuvres; and

(ii) specific flight characteristics.

(vi) operations of a multi-engine aeroplane in the exercises of paragraph (vii) including operation of an aeroplane solely by reference to instruments with one engine simulated inoperative and engine shutdown and restart. The latter training shall be at a safe altitude unless carried out in an FSTD.

(5) Phase 5

(a) Instruction and testing in Multi-Crew Cooperation (MCC) comprise of the relevant training requirements provided in Appendix 2.0. of Document SA-CATS 61.

2.6 SKILLS TEST

2.6.1 On completion of the related flying training, an applicant shall take either a single-engine or a multi-engine aeroplane−

(a) CPL(A) skills test provided in Appendix 2.1 of Document SA-CATS 61; and

(b) instrument rating skills test in a multi-engine aeroplane provided in Appendix 2.5 of Document SA-CATS 61.

3. CPL (A) with IR integrated course – Aeroplane

3.1 GENERAL

3.1.1 The objective of the CPL(A) and IR(A) integrated course is to train a pilot to the level of proficiency necessary to operate single-pilot, single-engine or multi-engine aeroplane in commercial air transport and to obtain the CPL(A) with IR.

3.1.2 An applicant wishing to undertake a CPL(A) with IR integrated course shall complete all the instructional stages in one continuous course of training as arranged by an ATO.

3.1.3 The course shall comprise of the following:

(a) theoretical knowledge instruction to the CPL(A) and IR knowledge level; and

(b) visual and instrument flying training.

3.1.4 An applicant failing or being unable to complete the entire CPL(A) with IR course may apply to the Director for the theoretical knowledge examination credits in accordance with Technical Standard 61.01.10.

3.2 THEORETICAL KNOWLEDGE

3.2.1 A CPL(A) with IR theoretical knowledge course shall comprise of at least 625 hours of instruction, directed study and exercises.

3.3 THEORETICAL KNOWLEDGE EXAMINATION

3.3.1 An applicant shall demonstrate the level of knowledge appropriate to the privileges of a holder of a CPL (A) in accordance with the requirements of Technical Standard 61.01.10. The detailed syllabus is contained in Appendix 2.0. of Document SA-CATS 61.

3.4 FLYING TRAINING

3.4.1 The flying training, not including type rating training, shall comprise of at least 180 hours, including all progress tests, of which up to 40 hours for the entire course may be instrument ground time.

3.4.2 An applicant shall complete at least a total of 180 hours of−

(a) 80 hours of dual instruction, of which up to 40 hours may be instrument ground time;

(b) 70 hours of flight time as PIC of which 55 hours may be SPIC including a minimum of−

(i) 50 hours of cross-country flight as PIC, including one VFR cross-country flight of at least 540 km (300 NM), in the course of which full-stop landings at two aerodromes different from the aerodrome of departure shall be made; and

(ii) 5 hours by night of which at least 3 hours shall be cross-country time by night.

(iii) 60 hours of instrument time which may comprise of instrument flight time, instrument ground time and compliance with subregulation 61.11.2(6) for the issuance of a multi-engine instrument flying rating if an applicant requires a multi-engine instrument rating; and

(iv) 5 hours of instruction in an aeroplane with adjustable flaps, retractable undercarriage and variable pitch propeller or turbojet engine.

3.5 FLYING INSTRUCTION PHASES

3.5.1 The flying instruction is divided into four (4).

(1) Phase 1

(a) Exercises up to the first solo flight comprise of a total of at least 10 hours of dual flight instruction on a single-engine aeroplane including –

(i) pre-flight operations, mass and balance determination, aeroplane inspection and servicing;

(ii) aerodrome and traffic pattern operations, collision avoidance and precautions;

(iii) control of the aeroplane by external visual references;

(iv) normal take-offs and landings;

(v) flight at critically slow airspeeds, recognition of and recovery from incipient and full stalls, spin avoidance; and

(vi) unusual attitudes and simulated engine failure.

(2) Phase 2

a. Exercises up to the first solo cross-country flight comprises of a total of at least 10 hours of dual flight instruction and at least 10 hours of solo flight including –

(i) maximum performance short field and obstacle clearance take-offs and short-field landings;

(ii) flight by reference solely to instruments, including the completion of a 180° turn;

(iii) dual cross-country flying using external visual references, dead-reckoning and radio navigation aids, and diversion procedures;

(iv) aerodrome and traffic pattern operations at different aerodromes;

(v) crosswind take-offs and landings;

(vi) non-normal and emergency procedures and manoeuvres, including simulated aeroplane equipment malfunctions;

(vii) operations to, from and transiting controlled aerodromes, compliance with air traffic services procedures, radio telephony procedures and phraseology; and

(viii) knowledge of meteorological briefing arrangements, evaluation of weather conditions for flight and use of Aeronautical Information Services (AIS).

(3) Phase 3

(a) Exercises up to the VFR navigation progress test comprises of a total of at least 5 hours of dual instruction and at least 40 hours as PIC.

(b) The dual instruction and testing up to the VFR navigation progress test shall comprise of the following:

(i) repetition of exercises of Phases 1 and 2;

(ii) VFR flight at relatively critical high airspeeds, recognition of and recovery from spiral dives; and

(iii) VFR navigation progress test, conducted by a flight instructor who did not participate in the applicant's training.

(4) Phase 4

(a) Exercises up to the instrument rating skill test comprise of the following:

(i) at least 55 hours of instrument time, which may contain up to 25 hours of instrument ground time in an approved FNPT I equivalent or up to 40 hours in an approved FNPT II or higher, which shall be conducted by a flight instructor or an authorised FSTD instructor;

(ii) at least 15 hours of instrument time flown as SPIC;

(iii) night flight including take-offs and landings as PIC;

(iv) pre-flight procedures for IFR flights including the use of the flight manual and appropriate air traffic services documents in the preparation of an IFR flight plan;

(v) procedures and manoeuvres for IFR operation under normal, abnormal and emergency conditions covering at least the

following:

(aa) the transition from visual to instrument flight on take-off;

(bb) standard instrument departures and arrivals;

(cc) en route IFR procedures;

(dd) holding procedures;

(ee) instrument approaches to specified minima;

(ff) missed approach procedures;

(gg) landings from instrument approaches, including circling;

(hh) in-flight manoeuvres and specific flight characteristics; and

(ii) operation of a multi-engine aeroplane in the exercises listed in paragraph) including operation of the aeroplane solely by reference to instruments with one engine simulated inoperative, and engine shutdown and restart, if the multi-engine rating is required.

3.6 SKILLS TEST

3.6.1 On completion of the related flying training the applicant shall take, in either a single-engine or a multi-engine aeroplane, the CPL (A) skills test in accordance Appendix 2.1 of Document SA-CATS 61 and the instrument rating skills test in accordance with Appendix 2.5 of Document SA-CATS 61.

4. CPL integrated course – Aeroplane

4.1 GENERAL

4.1.1 The aim of the CPL(A) integrated course is to train pilots to the level of proficiency necessary for the issue of a CPL(A).

4.1.2 An applicant wishing to undertake a CPL(A) integrated course shall complete all the instructional stages in one continuous course of training as arranged by an ATO.

4.1.3 A CPL (A) integrated course shall comprise of the following:

(a) theoretical knowledge instruction to the CPL(A) knowledge level; and

(b) visual and instrument flying training.

4.1.4 An applicant failing or being unable to complete the entire CPL(A) course may apply to the Authority for the theoretical knowledge examination credits in accordance with Technical Standard 61.01.10.

4.2 THEORETICAL KNOWLEDGE

4.2.1 A CPL(A) theoretical knowledge course shall comprise at least 350 hours of instruction, directed study and exercises.

4.3 THEORETICAL KNOWLEDGE EXAMINATION

4.3.1 An applicant shall demonstrate the level of knowledge appropriate to the privileges of the holder of a CPL (A), in accordance with the requirements in Technical Standard 61.01.10. The detailed syllabus is contained in Appendix 2.0 of Document SA-CATS.

4.4 FLYING TRAINING

4.4.1 The flying training, not including type rating training, shall comprise of a total of at least 150 hours including all progress tests of which up to 5 hours for the entire course may be instrument ground time. Within the total of 150 hours, an applicant shall complete at least−

(a) 80 hours of dual instruction of which up to 5 hours may be instrument ground time; and

(b) 70 hours of flight time as PIC of which 55 hours may be SPIC including a minimum of−

(i) 20 hours of cross-country flight as PIC including one VFR cross-country flight of at least 540 km (300 NM), in the course of which full-stop landings at two aerodromes different from the aerodrome

of departure, shall be made; and

(ii) 5 hours by night of which at least 3 hours shall be cross-country time by night.

(iii) 10 hours of instrument time which may comprise of instrument flight time and instrument ground time; and

(iv) 5 hours of instruction in an aeroplane with adjustable flaps, retractable undercarriage and variable pitch propeller or turbojet engine.

4.5 FLYING INSTRUCTION PHASES

4.5.1 The flying instruction is divided into four phases.

(1) **Phase 1**

(a) Exercises up to the first solo flight comprised of a total of at least 10 hours of dual flight instruction on a single-engine aeroplane including –

(i) pre-flight operations, mass and balance determination, aeroplane inspection and servicing;

(ii) aerodrome and traffic pattern operations, collision avoidance and precautions;

(iii) control of the aeroplane by external visual references;

(iv) normal take-offs and landings;

(v) flight at critically slow airspeeds, recognition of and recovery from incipient and full stalls, spin avoidance; and

(vi) unusual attitudes and simulated engine failure.

(2) **Phase 2**

(a) Exercises up to the first solo cross-country flight comprised of a total of at least 10 hours of dual flight instruction and at least 10 hours of solo flight including –

(i) maximum performance short-field and obstacle clearance take-

offs and short-field landings;

(ii) flight by reference solely to instruments, including the completion of a 180° turn;

(iii) dual cross-country flying using external visual references, dead-reckoning and radio navigation aids and diversion procedures;

(iv) aerodrome and traffic pattern operations at different aerodromes;

(v) crosswind take-offs and landings;

(vi) non-normal and emergency procedures and manoeuvres, including simulated aeroplane equipment malfunctions;

(vii) operations to, from and transiting controlled aerodromes, compliance with air traffic services procedures, radio telephony procedures and phraseology; and

(viii) knowledge of meteorological briefing arrangements, evaluation of weather conditions for flight and use of Aeronautical Information Services (AIS).

(3) **Phase 3**

(a) Exercises up to the VFR navigation progress test comprised of a total of at least 30 hours of instruction and at least 58 hours as PIC, including−

(i) at least 10 hours of instrument time which may contain 5 hours of instrument ground time in an FNPT or an FFS;

(ii) repetition of exercises in phases 1 and 2, which should include at least 5 hours in an aeroplane certificated for the carriage of at least 4 people and have a variable pitch propeller and retractable landing gear; and

(iii) night flight time includes take-offs and landings as PIC.

(4) **Phase 4**

(a) The dual instruction and testing up to the CPL(A) skills test comprise of the following:

(i) up to 30 hours of instruction which may be allocated to specialised aerial work training;

(ii) repetition of exercises in phase 3, as required;

(iii) ME training; and

(iv) if required, operation of an ME aeroplane including operation of an aeroplane with one engine simulated inoperative, and engine shutdown and restart, the latter exercise at a safe altitude unless carried out in an FSTD.

4.6 SKILLS TEST

4.6.1 On completion of the related flying training, an applicant shall take in either a single-engine or an ME aeroplane the CPL (A) skill test in accordance with Appendix 2.1 of Document SA-CATS 61.";

(b) the deletion of Appendix 3. B.

AMENDMENT OF SA-CATS 64

3. Document SA-CATS 64 is hereby amended by:

(a) the substitution for Technical Standard 64.01.8 for the following Technical Standard:

"1. A demonstration of competency in the English language is considered to be the ability to –

(a) communicate in the English language in a manner that is clear and easy to understand;
(b) compose concise, meaningful and unambiguous sentences or messages;
(c) use the correct terminology to match the setting;
(d) respond, narrate events or describe situations naturally;
(e) understand and follow instructions or commands pertaining to general safety and emergency procedures with relative ease; and
(f) ask and answer relevant questions **[,]** and engage in dialogue with relative ease.

2. English language competency shall be assessed during a pre-admission evaluation at **[either the operator or]** an approved ATO.

3. A person appointed by an **[operator or an]** approved ATO to conduct the pre-admission evaluation shall ensure that an applicant has a sufficient grasp of the English language to enable the applicant to comprehend the content of the cabin crew licence theoretical examination and practical skills test **[at the Authority]**.

4. Records of the pre-admission evaluation and outcome shall be kept for a period of 5 years.";

(b) the substitution in Technical Standard 64.01.9 section 1 for subsection (1) of the following subsection:

"**1. Requirements for application as Cabin Designated Examiner**

(1) An applicant shall be in possession of the following **[–]:**

(a) a valid Cabin Crew Instructor rating issued by the Authority;
(b) an original or certified copy of **[the]** a certificate of successful completion of an accredited NQF level 5 train-the-trainer course

and an original or certified copy of **[the]** a certificate of successful completion of an accredited NQF level 5 assessor course;

(c) a moderator qualification, if an examiner is required, by an ATO or an air service operator **[,]** to conduct **[moderation]** moderating activities and duties;

(d) a minimum of 500 hours as a cabin crew instructor, as recorded on the quarterly reports for cabin crew instructors and evidence of having undergone at least one redesignation as a cabin crew instructor;

(e) proof of fees payable as prescribed in Part 187; and

(f) a prescribed application form duly completed.";

(c) the substitution in Technical Standard 64.01.9 section 7 for subsection (2) of the following subsection:

"(2) The following letters shall be inserted after a designation reference number [-]:

(a) (R) for a Cabin **[Designation]** Designated Examiner (restricted); **[and]**

(b) (F) for a Cabin Designated Examiner (full)**[.];** or

(c) (F1) for a Cabin Designated Examiner (full, with a limitation on live fire fighting).";

(d) the substitution in Technical Standard 64.01.9 for section 10 and 11 of the following sections:

"**10. Responsibility**

(1) A Cabin Designated Examiner shall ensure that an applicant for a **[student cabin crew member licence or a]** cabin crew member licence has passed the relevant theoretical knowledge examination before commencing the relevant skills test.

(1.1) An initial applicant for a **[student]** cabin crew licence is required to pass the examination with the Authority prior to

commencing with the skills test conducted by a Cabin Designated Examiner.

[(1.2) An initial applicant for a cabin crew licence is required to pass the examination set by a holder of an ATO or an AOC prior to commencing with the skills test conducted by the Cabin Designated Examiner.]

(1.2) A cabin crew member attending recurrent training shall first successfully complete the theoretical examination set by a holder of an ATO approval or AOC prior to commencing with the skills test conducted by a Cabin Designated Examiner.

(1.3) A cabin crew member attending aircraft type rating training shall first successfully complete the theoretical examination set by a holder of an ATO approval or AOC prior to commencing with the skills test conducted by the Cabin Designated Examiner.

(1.4) A cabin crew member attending requalification training shall first successfully complete the theoretical examination set by a holder of an ATO approval **[or AOC]** prior to commencing with the skills test conducted by the Cabin Designated Examiner.

(1.5) A cabin crew member attending validation of foreign qualification training shall first successfully complete the theoretical examination set by a holder of an ATO approval **[or AOC]** prior to commencing with the skills test conducted by the Cabin Designated Examiner.

(2) A Cabin Designated Examiner shall conduct a skills test and issue a skills test report in accordance with an operator's or ATO's standard operating procedures, as applicable, as well as the relevant regulations.

(2.1) A Cabin Designated Examiner shall assess cabin crew member, cabin crew instructor or cabin-designated examiner to evaluate his or her ability to apply the required

knowledge and perform the tasks assigned to the required level of skill and competency to successfully complete a skills test.

(2.2) If a skills test is not completed due to circumstances beyond a cabin crew member or a Cabin Designated Examiner's control, the subsequent skills test shall be completed within 30 days of the date on which uncompleted skills test was initiated.

(2.3) In the case of a skills test not being completed due to circumstances beyond a cabin crew member's or a Cabin Designated Examiner's control, a Cabin Designated Examiner shall submit a report to an ATO, providing the reasons for the non-completion, within 7 days of the intervening event. Such a **[e]** report shall be kept on file for a period of 5 years.

(2.4) In the case where a cabin crew member does not satisfactorily complete a skills test, a cabin crew member shall attend additional training with a Cabin Crew Instructor before resubmitting himself or herself for a re-test. Such re-test shall be subject to the following **[–]**:

(i) where the Cabin Crew Instructor privilege is being exercised by a cabin designated examiner, that person shall not be the same person as the one who conducted the initial skills test;

(ii) no re-test may be conducted within 72 hours of an unsatisfactory skills test; and

(iii) a re-test shall not be satisfactorily completed if there are 3 or more drills in which there are 3 findings of "Not yet competent".

(3) A Cabin Designated Examiner may stop conducting skills tests if it becomes apparent that most of the cabin crew members are

misinterpreting or incorrectly executing the required drills. In the event skills test is either suspended or cancelled, a Cabin Designated Examiner is required to submit a report to an ATO, providing the reasons for this suspension or cancellation, within 7 days of the event. Such a report shall be kept on file for a period of 5 years.

(4) A Cabin Designated Examiner shall identify and address irregular practices by an ATO or an operator and report to the Authority on his or her findings.

(5) A Cabin Designated Examiner shall conduct a full briefing prior to the commencement of any assessment and this briefing provide for the following **[–]**:

(a) expectations and objectives of the drill;
(b) time permitted for the drill;
(c) number of attempts permitted for the competent completion of the drill;
(d) procedure to be followed in the event of a finding of “not yet competent”;
(e) actions that would constitute a finding of “not yet competent”;
(f) re-assessment procedure; and
(g) appeal procedure.

(6) A Cabin Designated Examiner shall conduct a full individual debriefing on the completion of the skills test.

(7) A Cabin Designated Examiner shall submit an individual training or assessment schedule, detailing his or her planned training or assessment activities and duties, to an authorised officer as requested.

(8) A Cabin Designated Examiner shall have knowledge of the Training and Procedures Manual of an ATO or the operations manual of an operator, as applicable.

(9) A Cabin Designated Examiner shall not permit more than 24 applicants per **[day]** sitting to undergo the theoretical examination, subject to the

[C]classroom being approved to accommodate such a number of applicants.

(10) A Cabin Designated Examiner shall not **[permit]** assess more than 12 applicants per **[day to undergo a practical drill assessment.]** drill as per Technical Standard 64.02.4(1.16). Consideration shall be given to the type of practical drill being assessed and the duration of each drill **[as reflected in the TGM].**

(11) A Cabin Designated Examiner shall not permit more than 30 applicants per **[day]** sitting to undergo the computer-based assessment environment.

(12) A Cabin Designated Examiner shall exercise his or her privileges according to the regulations, these technical standards **[, the published TGM and Code of Conduct]**.

(13) A Cabin Designated Examiner shall provide feedback, as required, to an ATO regarding the efficacy of training standards and assessment criteria development and improvement. Such feedback shall be recorded and placed on file for audit purposes.

(14) A Cabin Designated Examiner may be required to conduct a skills tests and assessments and issue skills test reports on behalf of the Authority.

(15) A Cabin Designated Examiner shall refrain from bringing the Authority into disrepute through defamatory or derogatory comments directed at either the Authority or its representatives.

11. Privileges of the designation

(1) A Cabin Designated Examiner may act as a Cabin Crew Instructor, provided that he or she complies with all requirements for re-designation as a Cabin Crew Instructor.

(2) A Cabin Designated Examiner may conduct the following skills tests and assessments:

(a) an initial skills test;

(b) recurrent skills test;

(c) validation of a foreign licence or competency card skills test;

(d) aircraft rating skills test;

(e) peer assessment of a cabin crew instructor; and

(f) peer assessment of a Cabin Designated Examiner.

(3) A Cabin Designated Examiner may be rated on unlimited aircraft types and variants.

(4) To maintain currency for an aircraft type used, all components of the cabin crew licence shall be valid and current.

(5) A Cabin Designated Examiner is required to have documented evidence that he or she is familiar with all the aircraft types on which he or she is conducting skills tests.

(6) Documented evidence referred to in subsection (5) shall include proof of familiarity with the following:

(a) type of equipment being used on board the aircraft type;

(b) procedures to be used to –

(i) access and operate equipment;

(ii) communicate with crew;

(iii) access, assess and operate exits, as applicable;

(iv) protect the cabin crew member from injury while performing the drill; and

(v) identify differences in the type(s) of equipment used to execute the drill.

(7) Acceptable evidence may be any of the following:

(a) proof of having been rated on the aircraft type or a recognised variant thereof; and

(b) an attendance register demonstrating that a Cabin Designated Examiner has been briefed or trained on the aircraft type by a type rated Cabin Designated Examiner or Cabin Crew Instructor. This attendance register may relate to attending an actual type rating or refresher training class.

(8) Except for the following components, a Cabin Designated Examiner may only conduct assessments and skills tests and issue skills test reports for aircraft types on which he or she is rated and current:

(a) wet ditching drills;

(b) live fire fighting drills; and

(c) slide jumps.";

(e) the substitution in Technical Standard 64.01.9 section 13, subsection (1) of the following subsection:

"**13. Maintenance of currency**

(1) A Cabin Designated Examiner shall maintain currency in the following components as indicated **[–]**:

(a) safety and emergency procedures annually;

(b) all aircraft type(s) for which skills test(s) are to be conducted and issued annually;

(c) general aviation security awareness every **[3]** 2 years;

(d) Dangerous Goods awareness every 2 years;

(e) first aid annually;

(f) live firefighting every 3 years;

(g) wet ditching every 3 years; and

(h) slide jump every 3 years.";

(f) the substitution in Technical Standard 64.01.9 for sections 14 and 15 of the following sections:

"**14. Monitoring of the system**

(1) The Director may require a Cabin Designated Examiner to subject himself or herself for surveillance, as required for the maintenance of standards.

(2) Surveillance may comprise any of the following **[–]**:

(a) a scheduled oversight conducted on a Cabin Designated Examiner by an authorised officer within a **[36]** 60-month period;

(b) an ad-hoc oversight conducted on a Cabin Designated Examiner by an authorised officer within a 60-month period;

(c) an audit of documentation, including quarterly reports and assessments conducted by the Cabin Designated Examiner;

(d) observation of a skills test(s) conducted on the Cabin Designated Examiner in the presence of an authorised officer;

(e) observation of annual assessments conducted by the Cabin Designated Examiner on a Cabin Crew Instructor; or

(f) observation of annual assessments conducted by the Cabin Designated Examiner on a Cabin Designated Examiner.

(3) A Cabin Designated Examiner shall conduct at least one assessment, annually, on the activities of a Cabin Crew Instructor or a Cabin Designated Examiner in the capacity of a Cabin Crew Instructor, if applicable.

(4) A Cabin Designated Examiner shall conduct at least one assessment, annually, on the activities of a Cabin Designated Examiner in the capacity of a Cabin Designated Examiner.

(5) For assessments conducted by a Cabin Designated Examiner, the following criteria shall apply **[–]**:

(a) a satisfactory outcome shall be achieved when the applicant attains a minimum of 75% following the assessment;

(b) if an applicant attains between 70% to 74%, a follow up oversight shall be conducted by an authorised officer. An applicant may continue exercising his or her privileges until the follow up oversight is conducted. The Authority shall charge the hourly rate fee as specified in terms of Part 187 for the follow up oversight.

(c) if an applicant attains 69% or less, a follow up oversight shall be conducted by an authorised officer. The Cabin Designated Examiner shall refrain from exercising any privileges until the follow up oversight has been satisfactorily conducted. The Authority shall charge the hourly rate fee as specified in terms of Part 187 for the follow up oversight.

(6) Surveillance may be conducted at an ATO or operator with which a Cabin Designated Examiner is affiliated or contracted.

(7) Where surveillance is conducted by an authorised officer and the outcome is unsatisfactory, a follow up surveillance shall be required. In this event, the Authority shall charge the hourly rate fee as specified in terms of Part 187 for the follow up oversight.

(8) The Director may withdraw or cancel a designation if –

(a) it becomes evident that a Cabin Designated Examiner, full, temporary or restricted, does not comply with the provisions of the regulations and this technical standard; **[or]**

(b) the withdrawal or cancellation is necessary in the interests of aviation safety; **[or]**

(c) any false or misleading information implicating a Cabin Designated Examiner, full, temporary, or restricted, comes to the attention of the Director, subsequent to the issuing of the designation; **[and]** or

(d) any other factors that may be considered by the Director.

(9) A Cabin Designated Examiner, full, temporary or restricted, shall, upon the withdrawal or cancellation of the designation by the Director, forthwith refrain from exercising any duties affiliated with the privileges of a Cabin Designated Examiner.

(10) A Cabin Designated Examiner may appeal the withdrawal or cancellation of the designation as provided for in Part 185.";

15. Re-designation of Cabin Designated Examiner

(1) The re-designation process applies to a Cabin Designated Examiner (full) and a Cabin Designated Examiner (restricted – Live Firefighting only).

(2) A Cabin Designated Examiner re-designation shall be valid for a period not exceeding 60 months (5 years) as determined by the Director.

(3) An initial designation shall be valid for a maximum period of 12 months (1 year). Thereafter, a risk assessment performed by the Authority, shall determine the validity of any further periods of approval granted by the Director, which shall not exceed a period of 60 months (5 years).

(4) On issuance of a re-designation, the Director may impose endorsements, restrictions or limitations, including the scope of designation.

(5) A Cabin Designated Examiner shall apply for maintenance of the designation annually, by submitting the following, at least 60 days prior to the anniversary of the designation:

(a) duly completed application form; and

(b) proof of payment of the fee as provided for in Part 187.

(6) When reviewing an annual maintenance application, the Director shall consider the following:

(a) the number of skills tests that the Cabin Designated Examiner has conducted over the year. A Cabin Designated Examiner is

expected to conduct an average of 4 skills tests consisting of a minimum of 2 drills each per quarter;

(b) where applicable, a comprehensive report providing reasons why a Cabin Designated Examiner has not conducted the required number of skills tests;

(c) quarterly reports as maintained by the Cabin Designated Examiner, kept on record at the ATO and these records shall be kept for a period of 5 years;

(d) proof of attendance of one Authority held conference for Cabin Designated Examiners;

(e) completion of one assessment, annually, on the activities of a Cabin Crew Instructor or a Cabin Designated Examiner in the capacity of Cabin Crew Instructor, as applicable;

(f) satisfactory completion of an annual surveillance conducted by an authorised officer; and

(g) the Cabin Designated Examiner's record of good standing with the Authority.

(7) Surveillance for maintenance of the designation shall be conducted annually by an authorised officer and if a follow up surveillance is required, the Authority shall charge the hourly rate fee as specified in terms of Part 187 for the follow up surveillance.

(8) Where an application for maintenance of the designation is declined by the Director, the Director shall provide an applicant with written reasons for the refusal.

(9) A Cabin Designated Examiner may apply for re-designation and the following shall be submitted to the Authority at least 60 days prior to the expiry of the designation:

(a) duly completed application form; and

(b) proof of payment of the fee as provided for in Part 187.

(10) When reviewing an application for re-designation, the Director shall consider the Cabin Designated Examiner's compliance with annual maintenance requirements.

(11) Where a Cabin Designated Examiner has not exercised his or her privileges for a period of between 12 to 36 months, an applicant shall –

(a) have a satisfactory assessment, in the capacity of Cabin Designated Examiner, conducted by a Cabin Designated Examiner; and

(b) have attended an Authority held conference for Cabin Designated Examiner;

(c) have a satisfactory oversight conducted by an authorised officer;

(d) have duly completed the required application form; and

(e) pay the appropriate fee, as provided for in Part 187.

(12) Where a Cabin Designated Examiner has not exercised his or her privileges for more than 36 months, an applicant shall –

(a) first follow the initial application process to become a Cabin Crew Instructor, if applicable. If an applicant has maintained the designation as a Cabin Crew Instructor then this shall not apply.

(b) follow the initial application process to become a Cabin Designated Examiner.

(13) A Cabin Designated Examiner over the age of 65 years shall be designated for a period not exceeding 12 months.

(14) Where an application for designation or re-designation is declined by the Director, the Director shall provide an applicant with written reasons for the refusal.

(15) The designation of a Cabin Designated Examiner, whether full, restricted or temporary, is a privilege and not a right. A designation and its consequent re-designation are exercised solely at the discretion of the Director.

(16) The Authority shall publish the names and contact details of all Cabin Designated Examiners, full and restricted, on the Authority's website.";

(g) the substitution in Technical Standard 64.01.10 of the following Technical Standard:

"**64.01.10 DESIGNATION OF CABIN CREW INSTRUCTOR**

1. Requirements for application as Cabin Crew Instructor

(1) An applicant for Cabin Crew Instructor shall be in possession of the following **[–]**:

(a) a South African cabin crew member licence;

(b) original or certified proof of having successfully completed an accredited NQF level 5 train-the-trainer course;

(c) original or certified proof of having successfully completed an accredited NQF level 5 assessor course;

(d) confirmation of at least 1000 flying hours as an active cabin crew member as reflected in a certified copy of summarised logbook or official letter issued by the operator, as applicable;

(e) other relevant training experience or qualification that may be determined by the Director;

(f) appropriate fee as prescribed in Part 187; and

(g) a prescribed application form, duly completed.

(2) An applicant for a Cabin Crew Instructor designation shall have sufficient ability in reading, speaking and understanding the English language to exercise the privileges of a cabin crew instructor.

2. Requirements for designation as Cabin Crew Instructor

(1) The Director may designate a holder of a cabin crew member licence as a designated Cabin Crew Instructor when an applicant –

(a) **[has achieved]** achieves a successful assessment by the Authority **[as provided in the TGM]**;

(b) complies with the developmental programme **[as provided in the TGM]**;

(c) successfully completes the required oversight process **[as provided for in the TGM]**; and

(d) signs an undertaking to abide by the Authority's Code of Conduct for Cabin Crew Instructors **[, as contained in the TGM**].

(2) (a) An applicant may attempt the assessment referred to in subsection (1) no more than 3 times within a 12-month period.

(b) If an applicant is not successful following the assessment and attains a mark of 70% to 74%, then an applicant may be re-assessed on the next available assessment date.

(c) If an applicant is not successful following the assessment and attains a mark of 69% or less, an applicant may apply to be re-assessed after a period of 6 months have lapsed, calculated from the date of the unsuccessful assessment.

(d) If the third and subsequent attempt is unsuccessful then an applicant shall not be permitted to apply for designation as a Cabin Crew Instructor for a further period of 12 months, calculated from the date of the last attempted assessment.

(e) An applicant shall be required to pay the application fee provided for in Part 187, for each application for an Initial Cabin Crew Instructor assessment.

(3) An applicant may lodge an appeal to the Director, against the outcome of an assessment, within 30 days.

(4) An applicant for a Cabin Crew Instructor designation may, on successful completion of the assessment conducted by the Authority, commence a developmental programme **[, as provided for in the TGM]**.

3. Developmental programme

(1) An applicant shall be required to successfully complete a developmental programme **[as described in the TGM].**

(2) The developmental programme shall be the responsibility of one Cabin Designated Examiner, however different Cabin Crew Instructors and Cabin Designated Examiners may be involved in the developmental process.

(3) On satisfactory completion of the developmental programme, a Cabin Designated Examiner responsible for the development of an applicant shall submit a recommendation letter to the Director, advising of an applicant's readiness for the initial oversight assessment.

(4) The developmental programme shall be completed within 12 months of successful completion of the assessment conducted by the Authority. If the developmental programme is not completed within 12 months, an applicant shall be required to submit a new application.

(5) During the oversight conducted by the authorised officer, the Cabin Designated Examiner responsible for the development of the applicant shall be present at all times.

4. Initial Oversight programme

(1) An initial oversight programme shall be scheduled on receipt of the letter of recommendation from a Cabin Designated Examiner, as provided for in technical standard 64.01.10. The letter of recommendation shall be forwarded at least 30 days preceding the commencement of an oversight assessment by the Authority.

(2) An applicant shall **[apply for]** undergo a minimum of two oversight assessments for initial designation which shall be conducted on

components as randomly selected by an authorised officer. **[The details pertaining to the initial oversights are further explained in the TGM**].

(3) If an applicant does not successfully complete the minimum of two oversight assessments as specified in **[paragraph (b) above]** subsection (2), a follow up oversight shall be required. In this event an hourly rate fee shall apply as provided for by Part 187.

5. Responsibility

(1) A Cabin Crew Instructor shall ensure that an applicant for a **[student]** cabin crew member licence **[or a cabin crew member licence]** receives all the necessary theoretical and practical training in accordance with the regulations and Document SA CATS 64, as applicable.

(2) A Cabin Crew Instructor shall identify and address the irregular practices of an ATO or an operator, and report the findings thereon to the Authority, as needed.

(3) A Cabin Crew Instructor shall as and when requested, submit an individual training schedule, detailing his or her planned training activities and duties to an authorised officer.

(4) A maximum number of 24 **[learners]** students per Cabin Crew Instructor per **[day]** class shall be permitted in the theoretical classroom environment, subject to the approval of the classroom for such numbers.

(5) A maximum number of 12 **[learners]** students per Cabin Crew Instructor per **[day]** class shall be permitted in the practical drill training environment. **[Consideration shall be given to the type of practical training being conducted and the duration of each drill as reflected in the TGM.]**

(6) A maximum number of 30 **[learners]** students per Cabin Crew Instructor per **[day]** class shall be permitted in the computer-based training environment, where the presence of an instructor is limited to providing support.

(7) A Cabin Crew Instructor shall exercise his or her duties according to these regulations, this Technical Standard, **[the published TGM]** and the Code of Conduct, as applicable.

(8) A Cabin Crew Instructor shall have access to and know the contents of the Training and Procedures Manual of an ATO or the operations manual of an operator, as applicable.

(9) A Cabin Crew Instructor shall ensure that all **[learners]** students are fully briefed and debriefed on each lesson.

(10) (a) A Cabin Crew Instructor shall provide feedback to the ATO or the operator regarding the efficacy of training standards and lesson plan development and improvement.

(b) Such feedback shall be recorded and placed on file, as needed, for audit purposes.

(11) A Cabin Crew Instructor may be required to conduct training at the behest of the Authority.

(12) A Cabin Crew Instructor shall refrain from bringing the Authority into disrepute through defamatory or derogatory comments directed at either the Authority or its representatives.

6. Privileges of the designation

(1) A Cabin Crew Instructor may unless restricted, be approved to conduct the following training –

(a) Cabin crew initial;

(b) Cabin crew recurrent;

(c) Validation of foreign cabin crew licence;

(d) Cabin crew refresher;

(e) Cabin crew aircraft rating;

(f) Cabin crew operator induction; and

(g) Flight deck crew safety and emergency procedures.

(2) A Cabin Crew Instructor may be rated on an unlimited number of aircraft types and variants.

(3) A Cabin Crew Instructor may exercise duties as a theoretical test examiner, including the invigilation of examinations and marking of papers.

7. Limitations of the designation

(1) A Cabin Crew Instructor shall not engage in any duties pertaining to the assessment or perceived assessment of cabin crew.

(2) A Cabin Crew Instructor may only conduct training on aircraft types on which he or she is rated and current.

(3) A Cabin Crew Instructor may only exercise the privileges applicable to his or her designation.

[(4) Where a Cabin Crew Instructor does not within a 36-month period, exercise any aspect within the scope of his/her designation, such Cabin Crew Instructor shall re-apply for the designation of those aspect(s), as provided for in the TGM.]

8. Maintenance of currency

(1) A Cabin Crew Instructor shall maintain the currency of the following components, as specified below –

(a) safety and emergency procedures, annually;

(b) all aircraft type(s) on which training is to be conducted, annually;

(c) general aviation security awareness, every **[3]** 2 years;

(d) Dangerous Goods awareness every 2 years;

(e) first aid, annually;

(f) live firefighting, every 3 years;

(g) wet ditching, every 3 years; and

(h) slide jump, every 3 years

(2) A Cabin Crew Instructor may undertake an approved training programme, with an accredited ATO in the event that such Cabin Crew Instructor is no longer affiliated with an operator, for the maintenance of the currency of those aircraft types which are utilised for training purposes.

(3) (a) The maintenance of a valid medical certificate is not a requirement for a designated Cabin Crew Instructor. However, a Cabin Crew Instructor that continues to operate as a cabin crew member shall be required to maintain the validity of all aspects of the cabin crew member licence.

(b) If a Cabin Crew Instructor develops a medical condition that might affect his or her ability to conduct training, the Authority shall reserve the right to refer the Cabin Crew Instructor for further medical assessment at his or her own cost.

(4) (a) Where the Cabin Crew Instructor has not conducted any training on aircraft type within a 6-month period, then he or she is required to complete refresher training prior to conducting any training on that aircraft type.

(b) A Cabin Crew Instructor may attend an actual refresher class or may review the material by himself of herself, which shall include all components as required by Part 121.

(c) Where a Cabin Crew Instructor completes the refresher training by reviewing the material by himself or herself, then he or she provide a statement to the ATO, that he or she has familiarised himself or herself with the content and is sufficiently confident to train cabin crew members, flight deck crew members, cabin crew instructors and cabin designated examiners following the refresher training.

(5) Where currency on an aircraft type has not been maintained for more than 12 months but less than 36 months, a Cabin Crew Instructor shall be required to attend recurrent training on that aircraft type prior to conducting any training on that aircraft type.

(6) Where currency on an aircraft type has not been maintained in excess of 36 months, a Cabin Crew Instructor shall be required to attend initial aircraft rating training prior to conducting any training on that aircraft type.

9. Monitoring of the system

(1) The Authority may at any time require a Cabin Crew Instructor to subject himself or herself **[for]** to a surveillance assessment, as required for the maintenance of standards.

(2) A surveillance assessment may comprise of any of the following –

(a) A scheduled oversight conducted on a Cabin Crew Instructor by an authorised officer, within a 60-month period;

(b) An ad-hoc oversight(s) conducted on a Cabin Crew Instructor by an authorised officer, within a 60-month period;

(c) An audit of documentation, including quarterly reports and peer assessments;

(d) Observation of a skills test conducted on a Cabin Crew Instructor in the presence of an authorised officer;

(e) Observation of annual assessments conducted on a Cabin Crew Instructor by a Cabin Designated Examiner.

(3) A Cabin Designated Examiner shall conduct at least one assessment, annually, on the activities of a Cabin Crew Instructor or a Cabin Designated Examiner in the capacity of a Cabin Crew Instructor, if applicable.

(4) For assessments conducted by a Cabin Designated Examiner, the following criteria shall apply **[–]**:

(a) A satisfactory outcome shall be achieved when the Cabin Crew Instructor attains a minimum of 75% following the assessment.

(b) If a Cabin Crew Instructor attains between 70% to 74%, a follow up oversight shall be conducted by an authorised officer. The Cabin Crew Instructor may continue exercising his or her privileges until the follow up oversight is conducted. The hourly rate fee as required in Part 187, shall apply.

(c) If a Cabin Crew Instructor attains 69% or less, a follow up oversight shall be conducted by an authorised officer. The Cabin Crew Instructor shall refrain from exercising any privileges until the follow up oversight has been satisfactorily conducted. The hourly rate fee as required in Part 187, shall apply.

(5) A surveillance assessment may be conducted at any ATO or operator to which a Cabin Crew Instructor is affiliated or contracted with.

(6) Where the outcome of a surveillance assessment conducted by an authorised officer is unsatisfactory, a follow up surveillance shall be required. The hourly rate fee as required in Part 187, shall apply.

(7) The Director may withdraw a designation if –

(a) it becomes evident that a Cabin Crew Instructor does not comply with the provisions of this technical standard;

(b) the withdrawal is necessary in the interests of aviation safety;

(c) any false or misleading information implicating a Cabin Crew Instructor comes to the attention of the Director, after the issuing of the designation; or

(d) the Director considers any other factors to be relevant.

(8) A Cabin Crew Instructor shall, upon the withdrawal of the designation by the Director, forthwith refrain from exercising any duties affiliated with the privileges of a Cabin Crew Instructor.

(9) A Cabin Crew Instructor may appeal the withdrawal of the designation as detailed in Part 185.

10. Re-designation of Cabin Crew Instructor

(1) The designation shall be valid for a period not exceeding 60 months or as determined by the Authority.

(2) An initial designation shall be valid for a maximum period of 12 months. Thereafter, a risk assessment performed by the Authority shall determine the validity of any further periods of approval granted by the Director, which shall not exceed a period of 60 months.

(3) The Director may impose any endorsement, restriction or limitation on the designation, including the scope of designation.

(4) Where an application for designation or re-designation is declined by the Director, the Director shall provide an applicant with written reasons for the refusal.

(5) The re-designation of an applicant shall depend on an applicant's compliance over the 60 months, with annual maintenance requirements.

(6) A Cabin Crew Instructor may apply for maintenance of the designation annually, by submitting the following, 60 days prior to the anniversary date of the designation:

(a) a duly completed application form; and

(b) proof of payment of the prescribed fee as provided for in Part 187.

(7) The Director shall consider the following when reviewing an annual application for maintenance **[–]**:

(a) the number of training components that the Cabin Crew Instructor has facilitated over the year.

Note 1: *A Cabin Crew Instructor is expected to present an average of 6 classes per quarter.*

Note 2: *A Cabin Designated Examiner with additional privileges of a Cabin Crew Instructor is expected to present an average of 3 classes per quarter;*

(b) where applicable, a comprehensive report detailing reasons why a Cabin Crew Instructor has not conducted the required number of training components;

(c) quarterly reports as maintained by the Cabin Crew Instructor, kept on record at the ATO or an air service operator and these records shall be kept for 5 years;

(d) proof of attendance of a conference for Cabin Crew Instructors held by the Authority;

(e) satisfactory completion of the annual assessment conducted by a Cabin Designated Examiner;

(f) satisfactory completion of the annual surveillance assessment conducted by an authorised officer; and

(g) a Cabin Crew Instructor's record of good standing with the Authority.

(8) A surveillance assessment for maintenance of the designation shall be conducted annually by an authorised officer and if a follow-up surveillance assessment is required, then an hourly rate fee as prescribed by Part 187, shall apply.

(9) Where the Director declines an application for maintenance of the designation, the Director shall provide an applicant with written reasons for the refusal.

(10) A Cabin Crew Instructor may apply for re-designation and the following shall be submitted to the Authority at least 60 days prior to the expiry of the designation:

(a) a duly completed application form; and

(b) proof of payment of the fee as prescribed in Part 187.

(11) When reviewing an application for re-designation, the Authority shall consider the Cabin Crew Instructor's compliance with annual maintenance requirements.

(12) Where a Cabin Crew Instructor has not exercised his or her privileges for a period of between 12 – 36 months, an applicant shall –

(a) have a satisfactory Cabin Crew Instructor assessment conducted by a Cabin Designated Examiner;

(b) attend an Authority held conference for Cabin Crew Instructors;

(c) have a satisfactory oversight assessment conducted by an authorised officer;

(d) complete the required application form; and

(e) pay the appropriate fee as prescribed in Part 187.

(13) Where a Cabin Crew Instructor has not exercised his or her privileges for a period of more than 36 months, an applicant shall follow the initial application process to become a Cabin Crew Instructor.

(14) A Cabin Crew Instructor over the age of 65 years old shall be designated for a period not exceeding 12 months.

(15) Designation as a Cabin Crew Instructor is a privilege and not a right and such designation or any consequent re-designation is exercised solely at the discretion of the Director.

(16) Where the Director declines an application for designation or re-designation, the Director shall provide an applicant with written reasons for the refusal.

(17) The Authority shall publish the names and contact details of all Cabin Crew Instructors on the Authority's website.";

(h) the substitution for Technical Standard 64.02.2 of the following Technical Standard:

"**64.02.2 TRAINING**

1. Aim of training course
2. **[Section 1]** Theoretical training for an initial cabin crew member licence
3. **[Section 3]** Practical training for an initial cabin crew member licence
4. Security awareness training for an initial cabin crew member licence
5. Dangerous goods awareness training for an initial cabin crew member licence
6. Cabin health and first aid training for an initial cabin crew member licence
7. Human performance training for an initial cabin crew member licence
8. Human trafficking awareness training for an initial cabin crew member licence

64.02.2 TRAINING

1. Aim of training course

(1) The aim of the cabin crew member training course is to train aspiring cabin crew members to the level of proficiency required for the issue of a cabin crew member licence and to ensure that each applicant acquires the competencies, knowledge and skills required to perform the tasks

related to the safety of passengers and flight during normal, abnormal and emergency situations.

(2) **[The training course is divided into two sections. On completion of section 1 of the cabin crew member training course, an applicant shall be required to complete an assessment with the Authority. Successful completion of the assessment shall result in the issuance of a cabin crew student licence]** The design and delivery of the training course shall be achieved by following a competency-based training model, that includes various training methods and resources to achieve the desired outcomes.

(3) **[An applicant may only undertake section 2 of the cabin crew member training course when that applicant is employed with an operator.]** The training course is divided into **[two sections]** the following components:

(a) Theory training for initial cabin crew member licence[.] ;

(b) Practical training for initial cabin crew member licence[.] ;

(c) Security awareness training for initial cabin crew member licence[.] ;

(d) Dangerous goods awareness training for initial cabin crew member licence[.] ;

(e) Cabin health and first aid training for initial cabin crew member licence[.] ;

(f) Human performance training for initial cabin crew member licence[.] ; and

(g) Human trafficking awareness training for initial cabin crew member licence.

(4) The course shall be conducted by the **[Authority approved]** Designated Cabin Crew Instructor or Cabin **[Designated]** Examiner. The required

skills test shall only be conducted by **[the Authority approved]** a Cabin Designated Examiner.

(5) **[Section one of the]** The initial training course for cabin crew members shall be conducted by an ATO.

(6) **Section two of the initial training course for cabin crew members may be conducted at an operator or an ATO that has a service level agreement to conduct the training on behalf of an operator.]** On completion of the components referred to in Technical Standard 64.02.2 subsections (2) and (3), an applicant shall be required to complete an examination with the Authority. Successful completion of the examination shall result in an applicant being able to undergo a skills test assessment, conducted by a Cabin Designated Examiner.

(7) An ATO shall ensure that the training syllabus reflects general industry practices and provides exposure to the full spectrum of **[practices]** duties and responsibilities that cabin crew members may encounter, irrespective of [the] an air service operator.

(8) Aircraft visits shall be conducted by designated Cabin Crew Instructors in accordance with the syllabus.

(9) Training resources shall include slide presentation, video, actual equipment and props relevant to a cabin crew environment, assignment, group work, role play, as well a traditional instruction methods.

2. Theoretical training for initial cabin crew member licence

(1) Theoretical training for an initial cabin crew member licence shall include the following modules:

(a) aviation indoctrination training;

(b) normal operations training; and

(c) abnormal and emergency situations training.

2.1 Aviation indoctrination training

(1) Aviation indoctrination training is defined as an introduction to the aviation environment.

(2) The goal of indoctrination training is to provide cabin crew students with general knowledge of basic aviation subjects so that they may have a more comprehensive understanding of aircraft operations. It allows cabin crew students to develop situation awareness and improves inter-crew communication, thus enhancing overall safety and improving the integration of cabin crew with the flight crew members and other aviation personnel.

(3) The knowledge imparted during indoctrination training serves to provide a general overview.

2.1.1 The aviation indoctrination training shall consist of the following subjects:

(1) regulatory overview;

(2) aviation terminology and communication;

(3) theory of flight and aircraft operations; and

(4) altitude physiology

2.1.2 Content of training syllabus

(1) Training objective

(a) A student shall be able to identify and describe the international and national aviation regulatory bodies and their operational powers.

(b) A student shall be able to identify and describe the specific regulations applicable to cabin crew members.

(2) Regulatory bodies

(a) A student shall be able to explain the history and origin of the international and national aviation regulatory bodies.

(b) Identify international regulatory and other relevant non-regulatory aviation organisations, within the Republic, Africa and global organisations such as ICAO, IATA, and EASA and describe-

(i) their objective and role in aviation especially as it relates to cabin crew members; and

(ii) how cabin crew members are required to comply with international regulations and penalties for breach of these regulations, such as organisation and individual liabilities.

(c) Identify the regulatory agencies that cabin crew members may come into contact with and describe their role in aviation, such as Customs, Police, Immigration, Health, Narcotics and Agriculture.

(d) Describe the objectives and roles played by national civil aviation entities such as authorities, including their inspectors and aerodrome licence holders; and

(e) Describe the regulatory system in the Republic and how it functions to draft regulations and standards, ensure compliance and investigate accidents and incidents.

(3) Civil aviation legislation

(a) Identify and describe the legislation governing flight crew in the Republic.

(b) Identify the trends in the industry, such as open skies, mergers and harmonisation.

(c) Identify historic legislation in cabin safety and describe its effect on aviation safety, such as fire protection and minimum crew.

(d) Identify the types of regulatory control the Authority exercises in areas of aviation safety.

(e) Identify other sources of regulatory guidance, such as technical directives, policy letters and compliance requirements.

(f) Identify and provide examples of air operator certificate (AOC) conditions and limitations.

(g) Identify and describe the specific regulations applicable to cabin crew members and cabin safety, including those for duty time limitations – flight crew, cabin crew and passenger safety.

(4) Civil aviation inspectors

(a) Outline the Authority inspectors to inspect various aviation-related operations.

(b) Describe the actions the inspectors may take if non-conformances are identified.

(c) Describe the types of inspectors that cabin crew may encounter during the course of their daily duties and activities.

(d) Describe the types of inspections that Authority inspectors may carry out.

(e) Describe the procedures to be followed whenever an inspector has identified himself or herself on board an aircraft.

(f) Describe the requirements for an Authority inspector to provide official identification.

(g) Describe the forms of identification that may be presented on the aircraft whenever a pre-flight or in-flight inspection is conducted.

(h) Identify the seating options and priority for an Authority inspector.

(5) An air service operator

(a) Identify and describe the specific roles and responsibilities of an air service operator, as prescribed.

(b) Describe the relationship between regulatory requirements and an operator's policies and procedures.

(c) Describe an air service operator's responsibility to conduct operations according to approved procedures and to ensure that any companies contracted by an air service operator also comply with these procedures.

(d) Identify the requirement to have an organisational chart with clearly defined responsibilities. Give examples of these and clearly outline the organisational links between pilots and cabin crew members.

(e) Identify the requirement for an air service operator to provide appropriate training ensuring cabin crew member competency in safety and emergency duties relating to the carriage of passengers.

(f) Define "operations manual" and describe an air service operator's responsibility to develop and maintain an operations manual. Describe an air service operator's responsibility to ensure that cabin crew members are familiar with the portions related to their duties.

(g) Identify the cabin crew manual as part of the operations manual and describe its contents. Describe the requirement to have a manual readily available during flight.

(h) Describe the means used to update, revise and amend the cabin crew manual and the requirements for cabin crew members to maintain an updated manual at all times.

(i) Describe the requirements for a senior cabin crew member on board an aircraft.

(j) Describe the minimum cabin crew requirements and exceptions to this TS.

(6) The cabin crew member

(a) Describe the responsibility of cabin crew members to maintain knowledge of all normal, abnormal and emergency procedures relating to their duties.

(b) Identify the requirement for cabin crew members to perform their duties in accordance with approved procedures.

(c) Describe the requirement to carry and maintain all documents reflecting competency.

(d) Describe the requirement to carry and maintain all documentation relative to flight duties, such as passport and security permit.

(e) Describe the responsibility of cabin crew members in reporting any on-board safety concerns to a PIC.

(f) Describe the responsibility of cabin crew members to successfully complete and maintain the required training and qualifications.

(g) Define the chain of command and describe the authority of a PIC and how this relates to maintaining flight safety.

(h) Describe the requirement to be aware of the duties and responsibilities of other cabin crew members and to be prepared to assume those duties, if necessary.

(i) Define what is meant by “person carried for the completion of non-safety-related duties”.

(j) Describe the function these persons would perform when assigned to a flight such as cabin crew members on familiarisation or line orientation flights, public relations function of cabin crew and a language specialist crew.

(k) Identify the importance of cabin crew members to be constantly alert and therefore be prepared to handle any abnormal or emergency situation that may occur.

(l) Describe the responsibility of a cabin crew member to comply with and enforce regulatory requirements.

2.1.3 Aviation terminology

(1) Training objective

(a) A student shall be able to define common industry terms of reference and be able to use them in an appropriate context.

(b) A student shall be able to describe and demonstrate the importance of effective communication in normal, abnormal (non-routine) and emergency situations.

(2) Terminology

(a) Identify and define terminology common in operations, including terms relating to airports, ground operations and flight operations.

(b) Describe the importance to flight safety of using correct terminology, amongst cabin crew members and when reporting to the flight crew in normal operations, as well as during abnormal and emergency situations.

(c) Identify and describe the phonetic alphabet in aviation-related communication, including providing examples of misunderstandings which may arise from improper use and its effect on flight safety.

(d) Identify and describe the 24-hour clock and its application in aviation.

(e) Identify and describe the changes of time with longitude, the meaning of coordinated universal time (UTC), time zones, the international date line and their application to aviation.

(f) List and identify examples of city codes for air service operator destinations, such as IATA city codes.

(g) Identify and describe the phases of flight as well as critical phases of flight.

(3) Communication

(a) Define “normal situations”, “abnormal situations”, and “emergency situations”.

(b) Define “communication”, “verbal communication” and “nonverbal communication”.

(c) Describe the differences in communication in different situations, including policies and procedures that may be used by different air service operators.

(d) Describe the importance of effective communication especially when dealing with abnormal and emergency situations, including the potential hazards to flight safety if communication is not effective.

(e) Describe effective communications techniques.

(f) Describe the importance of synchronized verbal and nonverbal communication.

(g) Identify how poor communication has contributed to aviation incidents and accidents and discuss ways to minimize these communication deficiencies.

(h) Describe the various tools of communication available to cabin crew members.

(i) Discuss the importance of listening to all announcements.

(j) Discuss the importance of being aware of passenger and crew non-verbal communication.

(k) Describe the various parties that a cabin crew member would be required to communicate with.

2.1.4 Theory of flight and aircraft operations

(1) Training objective

(a) A student shall be able to identify and describe the basic components of the theory of flight relating to the aircraft environment in which they will be operating.

(b) A student shall be able to identify and describe the specific regulations as applicable.

(c) A student shall be able to identify and describe the basic environment relating to aircraft operations.

(2) Theory of flight

(a) Identify the general components of an aircraft and describe their basic function both on the ground and in flight, including appropriate terminology, such as flaps, slats etc.

(b) Identify and describe the basic environment relating to aircraft operations, such as flight control surfaces and their function.

(c) Identify and describe the four forces acting on an aircraft in flight.

(d) Identify and describe the three axes of an aircraft and describe the aircraft movement around each axis.

(3) Aircraft operations

(a) Describe how lift is achieved and the factors which may adversely affect lift.

(b) Describe how a piston engine, turbine engine and jet engine functions, with relevant examples.

(c) Identify and describe aircraft critical surfaces and hazards to flight associated with the contamination of those surfaces.

(d) Define “surface contamination”.

(e) Describe conditions most likely to produce surface contamination and steps to take if suspected or identified.

(f) Describe the responsibilities of the cabin crew to report cases of suspected surface contamination to a PIC prior to the take-off roll.

(g) Describe the PIC's responsibilities in receiving reports of suspected surface contamination.

(h) Define "de-icing". Describe the procedures to be followed in the event of "de-icing".

(i) Describe the process of "de-icing" and the possible hazards associated with it.

(j) Describe how and when an aircraft is pressurised and how pressurisation is maintained, as applicable to the aircraft type.

(k) Describe the aerodynamic forces at work when aircraft engines fail in flight with specific reference to different aircraft types.

(l) Define what is meant by "aircraft attitude".

(m) Describe "weight and balance", passenger distribution and "centre of gravity" and their effect on aircraft controllability and stability.

(n) Identify the way that airspeed is measured and describe the conversion from knots to kilometres per hour.

(o) Describe what is meant by aircraft operating abnormalities which do not constitute an emergency, such as flap or landing gear failure, and visible fluid leaks.

(p) Describe the importance of timely communication of reporting observed deficiencies in the safe operation of an aircraft.

(4) Meteorology

(a) Describe the composition of the atmosphere – pressure, density and temperature.

(b) Describe types of common cloud formations and their effects on aircraft operations and cabin environment.

(c) Describe air masses and fronts and their effects on aircraft operations and cabin environment.

(d) Describe seasonal weather variations and their effects on aircraft operations and cabin environment.

(e) Describe the types of wind phenomena and their effects on aircraft operations and cabin environment, such as jet-stream, wind shear and turbulence.

(f) Identify and describe the hazards associated with volcanic ash and dust, ice formation on wings and control surfaces, the recognition and the importance of reporting such phenomena.

(g) Identify meteorological terms used in aviation which could be used during a crew briefing and require understanding by a cabin crew member.

(5) Air traffic control

(a) Define what is meant by VFR and IFR and identify the most common restrictions for an aircraft flying under VFR and IFR flight plans.

(b) Identify what is meant by air traffic control and who is responsible for ensuring aircraft separation under VFR and IFR conditions.

(c) Describe how an aircraft is controlled on the ground and in the air.

(d) Describe the various phases of air traffic control in relation to the various phases of flight.

2.1.5 Altitude physiology

(1) Training objective

(a) A student shall be able to identify and describe the most common physiological effects of flight in pressurised and non-pressurised aircraft, including likely causes, recognition and ways to minimise these effects.

(b) A student shall be able to identify and describe the specific regulations, as applicable.

(2) Altitude physiology

(a) Describe the difference between pressurised and non-pressurised aircraft cabins.

(b) Describe the physiology of respiration and circulation and the body's requirement for oxygen.

(c) Describe the physiological effects of pressure changes in the body (gases, cavities, sinuses and ears, etc.) including the difference between the physiological effects on adults and infants.

(d) Describe the physiological effects of cabin altitude on crew and passengers due to a significant reduction of available oxygen in the event of a cabin pressurisation problem or decompression, including the potential for crew member incapacitation, use of oxygen and oxygen masks.

(e) Describe the circumstances under which carbon monoxide poisoning may occur, signs and symptoms of poisoning and means of detecting and minimizing its effects.

(f) Describe decompression sickness and the physiological effects of pressure changes on gases in the body.

(g) Describe the physiological effects of scuba diving and cabin altitude on the body. Define "safe" times between scuba diving and flight.

(h) Define what is meant by "hypoxia", the hazards associated with it, including the persons most susceptible to the effects of hypoxia

and physiological effects of normal cabin altitude on occupants with medical conditions, signs and symptoms and means to detect and minimise its effects.

(i) Define “time of useful consciousness” at altitude, factors affecting time of useful consciousness, methods of protection (supplemental oxygen) and the importance of applying procedures in the case of loss of cabin pressure.

(j) Describe how to recognise and respond to passenger or crew member hyperventilation.

(k) Describe the most common physiological effects of altitude and the pressurised cabin, including but not limited to varicose veins, dehydration, effects of trapped gases and water retention.

(l) Describe the effects of altitude on night vision and the impact this has on flight safety and personal safety.

2.1.5 Normal operations training

(1) Normal operations training is defined as training which addresses procedures related to cabin crew members’ safety-related tasks during routine, day-to-day operations.

(2) The goal of normal operations training is to enable cabin crew members to competently carry out relevant tasks assigned to them during normal operations and actively contribute to a safe operation.

(3) Training includes the management of the cabin environment, the operation of equipment and aircraft systems relevant to cabin crew tasks, management of, and assistance to passengers, and coordination with flight crew, ground crew and other cabin crew members.

(4) Security procedures related to normal operations are included as part of this training. However, these may be covered during the approved aviation security awareness training alongside procedures for managing acts of unlawful interference such as hijacking.

(5) Procedures related to the operation of aircraft systems relevant to cabin crew tasks and equipment are included as part of this training. These should further be addressed during aircraft type training. However, they are included in the following section to provide a comprehensive overview of all the tasks accomplished by cabin crew members during normal operations.

2.1.6 Training syllabus

(1) The normal operations training shall consist of the following subjects:

(a) Phase of flight 1 -Ground and pre-flight operations;

(b) Phase of flight 2 -Pushback and taxi;

(c) Phase of flight 3 -Take-off;

(d) Phase of flight 4 -Climb;

(e) Phase of flight 5 -Cruise;

(f) Phase of flight 6 -Descent and approach;

(g) Phase of flight 7 -Landing; and

(h) Phase of flight 8 - post-landing and post-flight operations (including transit).

2.1.7 Contents of training syllabus

Phase of flight 1 - Ground and pre-flight operations

(1) Training objective

(a) A student shall be able to describe and perform all duties related to the period which commences when the cabin crew member reports for duty, prior to pushback or taxi, at the gate, ramp or

parking area, while the aircraft is stationary. These duties include the following:

(i) planning tasks;

(ii) flight crew and cabin crew briefings;

(iii) pre-flight checks; and

(iv) passenger boarding and pre-pushback tasks.

(2) Planning tasks

(a) Knowledge related to the performance of planning tasks is covered under the “Regulatory overview” topic.

(b) Identify and describe the components of flight crew coordination and its importance in achieving operational safety.

(c) Describe the importance of flight crew coordination when applying approved procedures.

(d) Describe the benefits of flight crew coordination on the working environment and morale and the effects this has on flight safety.

(e) Define “one crew concept” and identify ways this may be achieved.

(f) Describe the importance of flight crew coordination in abnormal and emergency situations, using examples of poor flight crew coordination and how this has contributed to aircraft accidents and incidents.

(3) Flight crew and cabin crew briefings

(a) Identify the importance of cabin crew briefings, including developing and enhancing cabin crew communication and coordination, establishing expectations and clarifying procedures.

(b) Describe when cabin crew briefings are required, including normal, abnormal and emergency situations.

(c) Describe the procedure regarding attending and participating in flight crew briefings.

(d) Describe the types of cabin crew briefings between a PIC and a senior cabin crew member or other cabin crew member, and between a senior cabin crew member and other cabin crew members.

(e) Describe the points to be covered in the different briefings.

(f) Identify the cabin crew member's responsibility to ask questions if all the required information has not been shared during the briefing or if the information is unclear.

(g) Describe the importance of sharing information with all cabin crew members.

(4) Pre-flight checks

(a) Describe the cabin crew responsibilities for conducting pre-flight checks, including when items are to be checked, which items are to be checked, how they are checked and who is responsible for checking them.

(b) Identify the importance of pre-flight checks and their impact on flight safety.

(c) Describe what is meant by the "minimum equipment list" and identify the cabin items which are included in it.

(d) Describe the types of conditions which may have airworthiness implications and the procedures to be taken to report this to the PIC such as cracked windows, damaged door seals, excessive water spills or leaks and obvious structural damage.

(e) Identify the logbooks required to be kept on an aircraft, including unserviceable tags.

(f) Describe the procedure for checking and recording information in the logbooks.

(g) Describe the procedures for reporting, removing and repairing unserviceable items.

(h) Describe the cabin crew responsibilities to ensure that all equipment is available and in good working order and properly secured when not in use.

(i) Define “safety and emergency equipment”.

(j) Describe each piece of safety and emergency equipment that is available on board an aircraft based on the following points:

(i) general description;

(ii) use(s);

(iii) location;

(iv) pre-flight serviceability check;

(v) removal from stowage;

(vi) operation;

(vii) conditions for operation;

(viii) operational limitations;

(ix) operation under adverse conditions, precautions for use; and

(x) care after use.

(k) The equipment and systems to be checked include but are not limited to:

(i) own seat and harness;

(ii) seat belts;

(iii) briefing cards;

(iv) fire extinguishers;

(v) oxygen bottles;

(vi) portable breathing equipment;

(vii) life jackets;

(viii) lavatory smoke detection systems;

(ix) fire prevention systems;

(x) emergency lighting; and

(xi) communication and passenger address systems.

(l) Describe the requirement to perform security checks and this includes but is not limited to the following:

(i) checking galleys, cabin, lavatories, remote areas, overhead bins and other compartments accessible to passengers and cargo compartment, when accessible from the cabin, for foreign objects, suspicious items or unauthorised persons;

(ii) completing any required documentation; and

(iii) communicating any observations to the senior cabin crew member or the flight crew members.

(5) Passenger boarding and pre-pushback tasks

(a) Describe the components of ramp safety, responsibilities for passenger movement on airport ramps and the procedures established to accomplish such safety.

(b) Describe hazards associated with airport ramps, such as aircraft, ground service traffic, noise, weather and foreign objects.

(c) Describe the hazards associated with traffic on the ramp, including aircraft movement, propellers, jet blast, vehicles and helicopters.

(d) Describe the coordination required between cabin crew members and ground staff to ensure passenger safety, such as stairs in position, propellers secured and ways to achieve this.

(e) Define “portable electronic devices” and identify the portable electronic devices most likely to be carried on board aircraft.

(f) Describe the safety concerns with the use of “headsets” during critical phases of flight, abnormal operations, boarding and disembarking across an open ramp.

(g) Describe the responsibility to notify passengers about the use of portable electronic devices on board aircraft.

(h) Describe cabin crew responsibilities for monitoring passengers to ensure that only acceptable portable electronic devices are accepted and used on board.

(i) Define “carry-on baggage” and describe –

(i) the safety implications of improperly stowed carry-on baggage;

(ii) the approved stowage locations for carry-on baggage including areas where carry-on baggage may not be stowed;

(iii) the requirement for placarding overhead bins, closets and drawers and the types of placarding that may be used;

(iv) the requirement to stow awkwardly shaped carry-on baggage such as strollers, musical instruments, canes, crutches, walking sticks and diplomatic mail;

(v) the cabin crew responsibilities for ensuring that all carry-on baggage is correctly stowed when required;

(vi) discuss the importance of cabin crew consistency in applying these requirements;

(vii) the cabin crew responsibility for monitoring carry-on baggage;

(viii) the effects of carry-on baggage on weight and balance.

(ix) the requirement to keep the exit areas clear and free from obstructions, such as carry-on baggage.

(x) the requirement to maintain clear access to emergency equipment.

(xi) the safety precautions to be taken when opening overhead bins and when handling items of carry-on baggage to prevent personal injury.

(j) Describe the non-smoking regulations and procedures for handling non-compliance.

(k) Describe the passenger boarding process –

(i) Describe the cabin crew responsibilities for passenger supervision while the aircraft is on the ground, including boarding, disembarking and station stops, including the minimum number of cabin crew members required to be present on the aircraft.

(ii) Describe the importance of safety duties over service duties during the passenger boarding process.

(iii) Describe the requirement for passengers to be in possession of a boarding pass at the time of boarding the aircraft.

(iv) Describe different types of boarding passes that may be encountered (digital, printed etc).

(v) Describe the cabin crew responsibility to check each passenger's boarding pass, such as. who is responsible for this, what shall be checked on a boarding pass, why it is important to check this information.

(vi) Describe the role that situational awareness and passenger observation during the boarding process plays in the

maintenance of safety and security on board the aircraft, including the recognition of signs of trafficking in persons.

(vii) Describe the policies pertaining to acceptance or denial of boarding to passengers and who is responsible for making this decision.

(l) Describe the regulatory requirements for refuelling with passengers on board and describe –

(i) the fuelling procedure and how this may occur such as over wing, with an engine running;

(ii) the potential hazards associated with fuelling aircraft while passengers are boarding or on board the aircraft;

(iii) the fuelling procedures that require passengers and crew to be disembarked from the aircraft and why this creates a greater hazard.

(iv) and define “designated evacuation exits during fuelling and associated procedures”;

(v) typical fuel leak or spill procedures, including the cabin crew responsibilities during this situation; and

(vi) typical fume detection procedures, including flight crew communication and the disembarkation of passengers.

(m) Define “service on the ground” and describe–

(i) the conditions under which service to passengers may be provided on the ground; and

(ii) the types of service which may be provided in normal situations and also in abnormal situations such as delays.

(n) Describe the pre-take-off passenger safety briefings and –

(i) the requirement for passenger safety briefings prior to departure; and

(ii) the intent and content of the mandatory announcements and when they shall be performed –

(aa) carry-on baggage;

(bb) pre-take off safety announcement and demonstration;

(cc) en route turbulence;

(dd) pre-landing;

(ee) post-landing;

(ff) special categories of passengers – individual pre-take off briefing; and

(gg) passengers seated at non-crewed exits – individual pre take off briefing;

(iii) the requirement to relay safety-related messages to passengers whenever flight conditions change or during abnormal or emergency situations;

(iv) the equipment required to accomplish the briefings;

(v) identify and describe the briefing requirements for special categories of passengers, including who briefs them, when the briefing occurs and the different briefing points for each type of passenger with special needs;

(vi) identify and describe the briefing requirements for passengers seated at non-crewed exits, including who briefs them, when the briefing occurs, who may be seated at a non-crewed exit and the different briefing points for the passenger seated at a non-crewed exit.

(o) Identify the different types of passengers that may be carried on board and describe the general handling considerations related to safety.

(p) Describe the requirement for passengers to comply with instructions of cabin crew.

(q) Describe the different types of passengers which may be carried, including special categories of passengers and special handling or seating requirements. This section should be covered in detail, with training provided on dealing with persons with disabilities, both physical and mental with a distinction between temporary and permanent disabilities, unaccompanied minors, parents with infants or pregnant women.

(r) Identify and describe the requirements and established procedures relating to onboard seating for passengers.

(s) Describe the requirement for each person to have his or her own seat with an individual safety belt.

(t) Describe the requirement for a passenger to be seated in his or her own seat for take-off, landing and whenever advised by a crew member.

(u) Describe the required positioning of seats for take-off and landing.

(v) Describe the different types of seat belts or harnesses found on passenger seats on different aircraft types and the correct method of operation of each, including a description of extension seat belts.

(w) Define “exit row” and describe policies and procedures regarding exit row seating, including relocation of passengers in compliance with exit row seating policies.

(x) Describe seating policies and procedures for passengers with special needs, including proximity to exits, use of supplemental oxygen, brace positions, ease of evacuation.

(y) Describe the seating restrictions regarding infants held in arms.

(z) Define “skycot” and “bassinet” and describe the procedures for the use of these devices, including restrictions regarding the occupant of the skycot or bassinet.

(Aa) Describe child restraint systems that are available for use on board an aircraft.

(Bb) Describe any placards or signage associated with passenger seating and describe the appropriate use thereof such as “Seat unserviceable” or “For Crew Use Only”.

(Cc) Describe the procedures for handling passengers who appear to be impaired due to alcohol or drugs, including cabin crew responsibilities in serving passengers who appear to be impaired.

(Dd) Identify and describe the requirements and established procedures relating to onboard seating for flight crew and describe:

(i) persons that are authorised to occupy the flight crew seats on board, including who has the authority to make decisions regarding occupation of flight crew seats on board;

(ii) persons that are authorised to occupy the observer seat(s) on the flight deck, including who has the authority to make decisions regarding the occupation of observer seat(s) on the flight deck;

(iii) the importance of ensuring serviceability of cabin crew seats, including whose responsibility it is to ensure this and when serviceability is checked;

(iv) the components of a pre-flight serviceability check for a cabin crew member seat such as “sit and fit” to enable quick access; and

(v) the procedures to follow and approve alternate seating in case of an unserviceable cabin crew member seat.

(Ee) Describe the procedures associated with closing aircraft doors, including the importance of complying with the signal and authorisation for door closing, ground communications and the availability of ground equipment.

(Ff) Describe the safety procedures required prior to take-off and landing of an aircraft and describe:

(i) the steps taken to secure the passenger cabin prior to taxi, take-off and landing;

(ii) the flight crew communication procedures prior to aircraft movement; and

(iii) the requirements and procedures for stowing equipment and securing galleys prior to take-off and landing.

(Gg) This topic shall be successfully completed when a student is able to describe the following tasks:

(i) check minimum crew complement;

(ii) apply procedures for ramp safety;

(iii) manage passenger boarding process;

(iv) apply procedures for refuelling with passengers on board, if applicable;

(v) monitor cabin;

(vi) reconcile or count passengers, if applicable;

(vii) check safe stowage of carry-on baggage;

(viii) brief passengers;

(ix) check that emergency exits and aisles are not obstructed;

(x) check condition of critical surfaces and report any contamination, if applicable;

(xi) secure galley;

(xii) secure cabin;

(xiii) close aircraft doors, if applicable; and

(xiv) check flight deck door is closed and secure.

2.1.8 Phase of flight 2 -Pushback and taxi

(1) Training objective

(a) A student shall be able to describe and perform all duties related to the period which commences when an aircraft begins to move in the gate, ramp or parking area, assisted by a tow vehicle, followed by the period when an aircraft moves on the aerodrome surface under its own power prior to take-off and these duties include “pushback and taxi tasks”.

(2) Pushback and taxi tasks

(a) Define “aircraft door” –

(i) Define “door status”, including the meaning of the terms “arm a door” and “disarm a door”.

(ii) Define “door status verification”, including the meaning of the terms “check” and “cross-check” doors.

(iii) Describe various aircraft door-closing procedures.

(b) Define “sterile flight deck”, including when it comes into effect and when it ends and describe:

(i) procedures associated with maintaining a sterile flight deck;

(ii) potential hazards to flight safety by violating the sterile flight deck rule; and

(iii) the conveying of safety-related information which may necessitate disregard of the “sterile flight deck” rule.

(c) Describe the safety demonstration and announcement.

(d) Describe the importance of gaining passenger attention for the safety demonstration and avoiding distractions related to the expanded use of portable electronic devices, when permitted.

(e) Describe the appropriate positioning of cabin crew members in the cabin during the safety demonstration.

(f) Describe the impact of conducting non-safety-related duties while the aircraft is taxing for take-off.

(g) Describe the required elements to be covered during a safety demonstration.

(h) Identify the equipment to be used during a passenger safety briefing.

(i) Describe how the safety demonstration shall be performed.

(j) Describe the importance of strong, positive body language during the performance of the safety demonstration, including the use of eye contact and synchronisation of actions with other cabin crew members.

(k) Describe the importance of clear, well-modulated announcements, including coordination of the announcement with demonstration actions.

(l) Describe the importance of checking that the cabin and galley are secure and describe:

(i) the hazards associated with unsecured equipment or items, and the risk of damage to the aircraft and injuries to aircraft occupants;

(ii) the procedure for checking passenger compliance with ordinance signs;

(iii) the procedures applied to complete cabin and passenger safety pre-take-off checks and their impact on flight safety, including exit row restrictions; and

(iv) the various areas on the aircraft that must be checked by the cabin crew member prior to take-off.

(m) Describe the importance of cabin crew members being in the assigned position with restraints secure during taxi and critical phases of flight and the consequences of non-compliance and define “crew station” .

(n) Identify when the crew station is to be occupied.

(o) Describe the signals used by the flight deck crew to advise cabin crew members that take-off or landing is imminent.

(p) Describe the requirements for cabin crew members to be seated with the restraint system secured for taxi, take-off, landing and whenever directed to do so by the PIC such as turbulence, if not performing safety-related duties.

(q) Describe the rationale behind the correct use of the seat belt and shoulder harness, including the hazards of improper use.

(r) Describe procedures for notifying the flight deck when the cabin is secure for take-off, or notification by cabin crew members to the flight deck crew if movement or take-off must be delayed.

(s) Identify the signals or verbal command(s) for cabin crew members to take up their assigned seats and secure themselves, including who is responsible for these signals.

(t) Describe the brace position for each cabin crew member:

(i) define “brace position”; and

(ii) describe the correct manner to occupy a cabin crew member seat such as forward, aft, side facing seats, including the preferred position for hands, feet, legs and head to ensure maximum protection.

(u) Perform the silent review:

(i) define “silent review”, including describing the components associated with it;

(ii) describe when the silent review must be performed and who is required to complete it; and

(iii) describe the importance of focusing on emergency procedures, situational awareness and limiting communications between cabin crew members to safety-related information during pushback and taxi.

(iv) Describe the safety procedures associated with aircraft movement on the ground and -

(i) describe the abnormal and emergency procedures relating to take-off such as runway excursion or inoperative exits in the event of an evacuation.

(ii) define “rejected take-off” and describe the associated procedures.

2.1.9 Phase of flight 3 -Take off

(1) Training objective

(a) A student shall be able to describe the tasks related to the period which commences when the flight deck crew apply take-off power, through rotation and to an altitude of 35 feet above runway elevation and these duties shall include the following:

(i) apply sterile flight deck procedure;

(ii) remain in appropriate safety seating position for take-off, including brace; and

(iii) perform silent review.

(2) Take-off tasks

(a) Knowledge related to the performance of take-off tasks is covered under the “Pushback and taxi” tasks.

2.1.10 Phase of flight 4 – Climb

(1) Training objective

(a) A student shall be able to describe the tasks related to the period which commences when the take-off phase ends through to arrival at the initial assigned cruise altitude and these duties include “perform climb tasks”.

(2) Climb tasks

(a) Describe the importance of being alert for any possible situation affecting flight safety and the safety of passengers and crew.

(b) Describe the responsibility and procedures to report any abnormality with the aircraft, its equipment or occupants to a PIC.

(c) Describe the importance of listening to all announcements if the announcement may contain emergency signals or information; and

(d) Describe the importance of monitoring operational aircraft systems relevant to cabin crew tasks for any abnormalities.

2.1.11 Phase of Flight 5 – Cruise

(1) Training objective

(a) A student shall be able to describe tasks related to the period which commences at any level flight segment after arrival at the initial cruise altitude until the start of the descent to the destination and these duties include the following:

(i) cruise tasks; and

(ii) security procedures.

(2) Cruise tasks

(a) Describe the hazards associated with turbulence and the procedures for ensuring passenger and cabin crew safety during periods of in-flight turbulence and define “turbulence”.

(b) Describe the different levels of turbulence such as light, moderate or severe and their effect(s) on persons and objects in the cabin.

(c) Describe the procedures for ensuring passenger safety during periods of turbulence, including ensuring that passengers comply with requirements and orders.

(d) Demonstrate an understanding of seat belt regulations, compliance and enforcement techniques and responsibilities.

(e) Describe the policies regarding cabin crew safety during periods of turbulence.

(f) Describe the procedures to stow service equipment during periods of turbulence.

(g) Identify the potential hazards to aircraft, cabin crew and passengers due to turbulence.

(h) Describe policies regarding communication with flight deck crew during turbulence, including the importance of crew coordination and communication.

(i) Describe the importance of proper cabin crew positioning during turbulence and proper use of a seat belt and harness.

(j) Describe the safety advice given to passengers during turbulence.

(k) Describe the policies for the safe operation of service equipment during flight.

(l) Describe the importance of being alert for any possible situation affecting the safety or security of the aircraft, passengers and crew, such as suspicious items or behaviours, smoking on board, safe stowage of service carts.

(m) Describe the requirement to report any abnormality with an aircraft, its equipment or occupants to a PIC.

(n) Describe the requirement for relaying critical safety information to flight deck crew members and other cabin crew members.

(o) Describe the regulatory requirements and cabin crew responsibilities regarding passengers who appear to be impaired due to psychoactive substances and, ability to recognise and differentiate symptoms related to the behaviour of a person impaired by psychoactive substances.

(p) Describe the regulatory requirements and cabin crew responsibilities regarding passengers smoking on board or tampering with smoke detection systems.

(q) Describe the procedure for the stowage of PEDs on board aircraft, including the effects of the use of PEDs on aircraft avionics during all phases of flight.

(r) Discuss the importance of recognising onboard medical events and associated procedures.

Note: *Knowledge of this topic is covered under "Cabin health and first aid"*

(s) Identify the physiological importance of oxygen.

(t) List the circumstances when additional oxygen may be required, i.e. loss of cabin pressure or medical emergencies.

(u) Describe the conditions under which oxygen is to be available for passengers and flight crew.

(v) Describe the requirement to brief passengers on the availability of oxygen.

(w) Describe, in general terms, the different types of oxygen available on different aircraft types, including fixed and portable systems.

(x) Describe the procedures for the use of the fixed cabin oxygen system.

(y) Describe the procedures for the use of the portable oxygen system.

(z) Describe procedures associated with using the flight deck oxygen system.

(Aa) Discuss the precautions to be taken when oxygen is being administered such as no open flame and monitor supply.

(Bb) Describe the flight crew communication procedures in each circumstance when oxygen is used.

(Cc) Describe the procedures for oxygen provided to passengers for continued medical use during flight.

(Dd) Describe the advice to be given to passengers during oxygen administration, including the person responsible for briefing passengers.

(Ee) Describe the regulatory requirements and cabin crew responsibilities related to passengers who appear to be intoxicated or appear to have consumed alcohol from their own supply.

(Ff) Describe the effects of altitude on alcohol and drug consumption.

(Gg) Describe the regulatory requirements and cabin crew responsibilities related to identifying and responding to suspected cases of trafficking in persons.

(Hh) Describe the flight deck protocol to be followed in-flight and describe:

(i) the safety implications of critical phases of flight and procedures associated with the concept of a sterile flight deck;

(ii) the flight crew communication and coordination procedures associated with flight deck visits;

(iii) the process associated with service to the flight deck crew while in flight;

(iv) the need for coordinating visits to the flight deck with the availability of oxygen masks;

(v) the need for cabin crew to be aware of pilots monitoring radio calls when entering the flight deck;

(vi) the requirement to brief supernumeraries on appropriate behaviour on the flight deck; and

(vii) the policy regarding serving alcohol in the flight deck.

(3) Security procedures

(a) Describe the procedures associated with entry to the flight deck, including PIC authority to give permission for access to the flight deck.

(b) Describe the policies for security of the flight deck door, including locking and unlocking procedures

(c) Define “clear zone”.

(d) Describe the need to supervise and monitor supernumeraries on the flight deck.

(e) Describe the procedures regarding recognition and management of the various security threats, including communication with the flight deck crew.

(f) Describe the levels of threat associated with unruly behaviour and procedures associated with each level.

Note: *This topic may be completed as part of the "Aviation security awareness" subject.*

2.1.12 Phase of flight 6 – Descent and approach

(1) A student shall be able to describe the tasks related to the period which commences when an aircraft leaves the level flight segment to start a controlled descent to the destination and ends with the beginning of the landing flare. These duties include "prepare cabin for landing".

(2) Prepare cabin for landing

(a) Describe the importance of securing the cabin and galley, the hazards associated with unsecured equipment or items and the risk of injuries to aircraft occupants.

(b) Describe the procedures applied to complete cabin and passenger safety pre-landing checks and their impact on flight safety, including verifying compliance with exit row seating restrictions and making a safety announcement, if applicable.

(c) Describe the sterile flight deck concept; when it comes into effect and when it ends, the importance of limiting communications with the flight deck crew to safety critical information once the sterile flight deck is in effect.

(d) Describe the importance of cabin crew members being in the assigned position with restraints secure during critical phases of flight and the consequences of non-compliance.

(e) Describe the procedures for notifying the flight deck crew when the cabin is secure for landing, or notification by cabin crew to flight deck crew if landing must be delayed.

(f) Describe the different types of pre-landing signals.

(g) Describe the importance of focusing on emergency procedures, of situational awareness and of limiting communications between cabin crew members to safety-related information during descent and approach.

(h) Describe the emergency procedures related to landing (go-around causes, effects on occupants and relevant procedures such as communication):

(i) define “missed approach” and describe the associated procedures; and

(ii) describe abnormal landing procedures such as no landing gear, partial landing gear, and burst or deflated tyres.

Note: *It shall be noted that many of the pre-landing tasks are similar to the pre-take-off tasks. The requirements will therefore not be repeated in this topic.*

2.1.13 Phase of Flight 7 – Landing

(1) Training objective

(a) A student shall be able to describe the tasks related to the period which commences when the landing flare begins until the aircraft exits the landing runway, comes to a stop on the runway, or when power is applied for take-off in the case of a touch-and-go landing and these duties include "perform landing tasks".

(2) Describe landing tasks

(a) describe the sterile flight deck procedure;

(b) remain in and demonstrate the appropriate safety seating position for landing, including the brace position;

(c) perform silent review

(d) describe the emergency procedures related to landing, such as touch-and-go landing, abnormal attitude landing, high-speed landing, cross-wind landing such as causes, effects on occupants and relevant procedures such as communication.

Note: *It should be noted that many of the landing tasks are similar to the pre-landing tasks. The requirements will therefore not be repeated in this topic.*

2.1.14 Phase of flight 8 – post-landing and post-flight operations

(1) Training objective

(a) A student shall be able to describe the tasks related to the period which commences when the aircraft exits the landing runway, continues upon arrival at the gate, ramp, apron or parking area when the aircraft ceases to move under its own power and ends when the cabin crew member completes his or her duties assigned for the flight and these duties include the following:

(i) post-landing and post-flight tasks; and

(ii) transit tasks.

(2) Post-landing and post-flight tasks

(a) Describe the importance of being alert for any possible situation affecting the safety of passengers and crew, and the responsibility to report any abnormality with the aircraft, its equipment or occupants to a PIC.

(b) Describe the importance of listening to all announcements in the event that the announcement may contain emergency signals or information.

(c) Describe the importance of monitoring operational aircraft systems relevant to cabin crew tasks for any abnormalities.

(d) Describe the requirement to comply with the signal and authorisation for door opening.

(e) Describe the requirement for ground communications and the availability of ground equipment after the door has been opened.

(f) Describe the precautions taken when opening aircraft doors and monitoring open doors if ground equipment is not available.

(g) Describe various aircraft door opening procedures, including the importance of complying with the signal and authorisation for door opening.

(h) Describe the importance of remaining at the assigned cabin crew station during the door opening and passenger disembarkation process.

(i) Describe the components of apron safety, the responsibilities and procedures established to facilitate passenger movement on aircraft aprons, air bridges, boarding using stairs, etc.

(j) Describe the importance of ensuring all passengers have disembarked the aircraft at flight termination.

(k) Describe the possibility of passengers remaining on board for transit purposes.

(l) Describe the importance of proper reporting, including the elements of good reporting techniques.

(m) Describe the importance of communication in instances of a cabin crew change, including the responsibility of the cabin crew to brief new cabin crew regarding any unserviceability, passengers with special needs or status, or any other safety-related matters pertinent to the flight.

(3) Transit tasks

(a) Describe the importance of being alert for any possible situation affecting the safety of passengers and crew, including procedures to report any abnormality with the aircraft, its equipment or occupants to a PIC.

(b) Describe the requirement to relay critical safety information to flight deck crew members and other cabin crew members.

(c) Describe the importance of listening to all announcements in the event that the announcement may contain emergency signals or information.

(d) Describe the requirement for a pre-flight briefing including crew coordination and communication, establishing expectations and clarifying procedures.

(e) Describe the minimum cabin crew complement during transit stops.

(f) Describe the components of apron safety, the responsibilities for passenger movement on airport aprons

and procedures established to facilitate passenger movement on airport aprons, air bridges, etc.

(g) Describe the cabin crew responsibilities for passenger supervision while the aircraft is on the ground, including seating restrictions, proper selection of passengers seated at emergency exit rows, relocation of passengers in compliance with seating procedures, and acceptance and use of child restraint devices.

Note: *Where the tasks to be completed are similar to those covered in other topics, they will not be repeated here.*

2.2 Abnormal and Emergency situations training

(1) Abnormal and emergency situations training is defined as training which addresses emergency procedures and focuses on the cabin crew members' tasks during these types of situations.

(2) "Emergency procedures" means all procedures established for abnormal and emergency situations. For this purpose, "abnormal" refers to a situation that is not typical or usual, deviates from normal operation and may result in an emergency.

(3) The goal of this training is to enable cabin crew members to immediately recognise an abnormal or emergency situation, rapidly gain awareness of situational dynamics, as required to initiate communication with the flight deck crew and take necessary measures to deal with the situation. The training should also enable cabin crew members to expect additional risks that may result from the actions they choose to take and mitigate them, if required.

2.2.1 Training syllabus

(1) Abnormal and emergency situations training shall consist of the following subjects:

(a) Firefighting;

(b) Smoke and fume events;

(c) Cabin pressurisation problems and decompression;

(d) Prepared and unprepared emergency landing or ditching;

(e) Evacuation and rapid disembarkation;

(f) Flight deck and cabin crew member incapacitation;

(g) Fuel dumping; and

(h) Propeller abnormalities

2.2.2 Contents of training syllabus

(1) Firefighting training objective

(a) A student shall be able to identify the types of fire, fire detection, firefighting systems and the established firefighting procedures.

(2) Firefighting

(a) Identify the threat to safety presented by inflight fires. Describe historic fire incidents and accidents and identify the safety lessons learned, including legislated requirements as a result.

(b) Describe the chemistry of fire, including the elements which must be present for a fire to occur.

(c) Describe the different classes of fire that may occur onboard an aircraft.

(d) Identify the different types of fire, means of fire detection, firefighting systems and established firefighting procedures.

(e) Describe the location, pre-flight check, chemical properties and use of firefighting and protective equipment on board different aircraft. This may include but is not limited to –

(i) smoke detectors;

(ii) portable extinguishers;

(iii) installed automatic extinguisher, such as lavatory;

(iv) crowbar;

(v) axe;

(vi) portable breathing equipment;

(vii) protective gloves; and

(viii) equipment specific to accessible cargo compartments or cargo aircraft.

(f) Describe various fire prevention techniques and this may include but is not limited to the following:

(i) maintaining situational awareness and responding immediately whenever an onboard fire or smoke situation is suspected;

(ii) monitoring smoking in the cabin and lavatories;

(iii) inspecting the integrity of automatic lavatory extinguishers;

(iv) checking that the lavatory waste bin cover flap is closed at all times;

(v) preventing ignited materials from being discarded in trash carts; and

(vi) identifying and eliminating hazardous flammable materials.

(g) Describe and demonstrate techniques and procedures for firefighting and this may include but is not limited to the following:

(i) immediate and aggressive approach to finding the source of the fire;

(ii) fighting the fire aggressively and effectively;

(iii) applying appropriate firefighting procedures to the type of fire;

(iv) type of extinguisher to be used based on the type of fire;

(v) additional firefighting equipment needed such as portable breathing equipment (PBE);

(vi) techniques for using extinguishers; and

(vii) communicating while using PBE.

(h) Describe and demonstrate firefighting procedures for specific types or locations of fires and this may include but is not limited to:

(i) galleys;

(ii) lavatories;

(iii) overhead bins;

(iv) electrical systems;

(v) ovens;

(vi) flammable liquids;

(vii) metal fires;

(viii) lithium battery fires;

(ix) upholstery;

(x) remote locations, e.g. crew rest or lower level galleys;

(xi) hidden fires; and

(xii) assisting with flight deck fires, if the flight deck crew requires assistance.

(i) Describe and demonstrate specific crew member responsibilities for firefighting and the importance of being prepared to apply specific firefighting procedures.

(j) Describe and demonstrate the importance of crew communication and coordination in fighting a fire and providing the flight deck crew with accurate updates on:

(i) fire source or location;

(ii) extent, severity of smoke or fire;

(iii) actions taken, including relocation of passengers and maintenance of breathing comfort;

(iv) notification of any injuries to passengers and crew members;

(v) types and the number of firefighting equipment used; and

(vi) current status of smoke or fire, as the situation progresses.

(k) Describe obstructions to firefighting onboard aircraft and his may include but is not limited to:

(i) limited visibility due to smoke or fumes;

(ii) firefighting in confined spaces;

(iii) difficulty in locating or accessing the source of the fire such as hidden fires; and

(iv) resources to fight the fire such as limited number of portable extinguishers.

(l) Describe the hazards associated with onboard fires and this may include but is not limited to:

(i) toxicity of smoke and fumes;

(ii) flammability of cabin materials; and

(iii) variety of combustible materials and volatility.

(m) Define “flashover” and “flashfire”. Describe the cause and dangers of each and conditions onboard an aircraft where this would be likely to occur.

(n) Identify different external fires such as engine fires, tailpipe fires, fuel spill or apron fires, fires on loading bridges, service vehicle fires, torching, etc. and describe the procedures established for such fire situations including recognition, communication and coordination, with both ground crew and flight deck crew.

(o) Describe the procedure for completing the applicable documentation, such as the incident report form.

(p) This topic shall be successfully completed when a student is able to perform the following tasks:

(i) detect and eliminate fire hazards;

(ii) locate source of smoke or fire;

(iii) identify the type of fire;

(iv) apply communication procedures;

(v) use appropriate firefighting equipment and protective equipment, as required;

(vi) fight fire;

(vii) manage passengers and cabin, as required;

(viii) apply post fire-fighting procedure; and

(viii) complete the applicable documentation.

2.2.3 Smoke and fume events

(1) Training objective

(a) A student shall be able to identify the hazards associated with fumes or smoke in the cabin, the potential sources and the

established procedures for dealing with these situations in the cabin, inflight or on the ground. These duties include the following:

(i) apply procedure for smoke events; and

(ii) apply procedure for fume events.

(2) Apply procedure for smoke and fume events –

(a) Define “smoke removal” and “smoke control”.

(b) Describe the possible sources of smoke in the cabin.

(c) Describe the possible sources and types of fumes in the cabin.

(d) Describe the potential hazards to the aircraft and its of smoke or fumes in the cabin.

(e) Describe the requirement for crew to be alert for smoke or fumes in the cabin, including the odour descriptors to recognise the presence of oil and hydraulic fluid fumes.

(f) Describe the associated procedures for dealing with smoke or fume events on different types of aircraft, including flight crew communication and advice to passengers.

(g) Describe the potential for crew member impairment, including a list of potential acute symptoms that may be experienced as a result of exposure to smoke, oil or hydraulic fluid fumes, and its impact on flight safety.

(h) Describe the authority of a PIC to relocate passengers if smoke or fumes are present in the cabin, and when this decision may be taken.

(i) Describe how to recognise condensation in the cabin, its similarity to smoke, the causes of this and the phases of flight when it is most likely to be visible.

(j) Describe the procedures for completing the applicable documentation, such as an incident report form.

(k) This topic shall be successfully completed when a student is able to complete the following tasks:

(i) identify and locate the source of the smoke;

(ii) identify the type and intensity of the smoke;

(iii) identify and locate the source of the fumes;

(iv) identify the type and intensity of the fumes;

(v) apply communication procedures;

(vi) manage passengers and cabin, as required;

(vii) apply post-event procedures; and

(ix) complete the applicable documentation.

2.2.4 Cabin pressurisation problems and decompression

(1) Training objective

(a) A student shall be able to recognise rapid decompression and cabin pressurisation problems and have knowledge of associated cabin crew responsibilities, and the established procedures for dealing with each situation. These duties include “manage cabin pressurisation problems or decompression”.

(2) Manage cabin pressurisation problems or decompression

(a) Define the following terms:

(i) hypoxia;

(ii) euphoria;

(iii) decompression; and

(iv) rapid decompression.

(b) Describe the elementary physiology of oxygen intake and utilisation.

(c) Describe the general effects of hypoxia, including the recognition and dangers associated with hypoxia's euphoric effect, aggravation by exertion, individual susceptibility in healthy persons, increased susceptibility in some medical conditions, altitude and time of useful consciousness (duration of consciousness without supplemental oxygen).

(d) Describe the effects of oxygen deficiency on human performance and identify the importance of recognising these signs and symptoms in other crew members.

(e) Describe body gas volume changes, including abdominal pain on cabin altitude descent and "blocked ears" on emergency descent of aircraft.

(f) Describe the effects on the human body of reduced atmospheric pressure.

(g) Describe the effects of rapid decompression on any unsecured objects or persons.

(h) Describe the conditions in the cabin and the potential threat to flight safety caused by rapid and slow decompressions.

(i) Describe the likely cabin altitude during rapid decompressions and cabin pressurisation problems, including what is meant by a "safe" altitude and the importance of reaching a safe altitude quickly.

(j) Describe the potential causes of rapid decompression such as fuselage failure, window or door blowout, air pack failure.

(k) Describe the potential causes of cabin pressurisation problems such as door seal leaks, cracked windows, system malfunctions.

(l) Describe the location, pre-flight check and use of portable oxygen devices.

(m) Describe the immediate actions to be taken in the event of rapid decompression or cabin pressure leaks for the safety of the passengers and the cabin crew.

(n) Describe the operation of passenger oxygen systems and the use of oxygen masks.

(o) Describe the procedures for crew and passenger communication and coordination during rapid decompression and cabin pressurisation problems, including identification of specific information to be relayed to the flight deck crew and back-up means of communication should normal systems be rendered inoperative such as structural damage.

(p) Describe the expected flight deck crew response such as emergency descent, and its effect on the cabin and its occupants.

(q) Identify the mechanical indications and safety measures in place onboard the aircraft in the event of a decompression such as blowout panels.

(r) Describe the need for cabin crew members to obtain oxygen first before attending to passengers' needs.

(s) Describe the post-decompression procedures, including who or what initiates the commencement thereof.

(t) Describe the procedures for completing applicable documentation, such as an incident report form.

(u) This topic shall be successfully completed when a student is able to complete the following tasks:

(i) recognise signs and symptoms of cabin pressurisation problems or decompression;

(ii) don the nearest oxygen mask, if installed;

(iii) secure self and occupy the nearest seat, if available;

(iv) apply communication procedures;

(v) apply post-decompression procedures; and

(vi) complete the applicable documentation.

2.2.5 Emergency landing or ditching

(1) Training objective

(a) A student shall be able to identify the types of evacuations, cabin crew responsibilities and procedures relating to the different types of emergency situations and this includes –

(i) apply procedures for an anticipated or a prepared emergency landing or ditching; and

(ii) apply procedures for an unanticipated or unprepared emergency landing or ditching.

(2) Apply procedures for an anticipated or a prepared emergency landing or ditching:

(a) where the tasks to be completed are similar to those covered in other topics, they will not be repeated here;

(b) identify the verbal and nonverbal signals and/or commands indicating an emergency situation;

(c) describe the importance of gathering information from the flight deck crew and what this briefing shall include:

(i) a person responsible for conducting the briefing;

(ii) when and where to conduct the briefing;

(iii) information that is required;

(iv) time available, special instructions; and

(v) the manner in which the briefing is to be conducted.

(d) describe the method of communicating the briefing to the other cabin crew members;

(e) describe the importance of applying the appropriate procedures and checklist during an anticipated or a prepared emergency landing in a sequence to ensure that priority items are identified and accomplished first;

(f) describe and demonstrate examples of the preparation for emergency evacuation on land and on water and this may include but is not limited to:

(i) cabin crew tasks;

(ii) brace position;

(iii) appropriate commands;

(iv) precautions and adaptations for passenger management;

(v) element of time and time management;

(vi) donning of life jackets; and

(vii) various possible aircraft attitudes and associated evacuation procedures;

(g) describe the responsibility of cabin crew members to provide effective leadership during the preparation for an emergency and during an evacuation;

(h) describe the responsibility of cabin crew members to prepare passengers and the cabin in an anticipated or a prepared emergency situation, including the effect of time constraints;

(i) define “Able-Bodied Passenger (ABP)”;

(j) describe the type of a person a cabin crew member would select to be an ABP, including the assistance they could provide during the emergency preparation and the evacuation;

(k) describe the importance of assigning, relocating and briefing ABP, as required, as well as the items to cover in the briefing;

(l) describe the different types of passenger behaviour and identify effective ways of managing passenger behaviour while preparing for an emergency landing and during an evacuation;

(m) define “brace position”;

(n) describe the effect of seat pitch on preferred brace positions;

(o) describe and demonstrate the brace position(s), including the importance of assuming the preferred brace position to minimise injury;

(p) identify the signal typically given for assuming the brace position in emergency situations, including when it is given, who is responsible for giving the signal and the crew's responsibilities when the brace signal has been given. Identify when cabin crew members should assume the brace position when no signal has been given;

(q) describe and demonstrate the appropriate brace commands;

(r) describe the components and importance of performing a silent review in preparation for an evacuation;

(s) describe the requirement for completing the applicable documentation, such as the incident report form;

(t) this topic shall be successfully completed when a student is able to complete the following tasks:

(i) recognise emergency signal from the flight deck crew;

(ii) obtain briefing from the flight deck crew on the situation;

(iii) stow service-related items and stand-by for further instructions;

(iv) brief cabin crew on the situation;

(v) brief passengers;

(vi) don life jacket, in case of ditching;

(vii) assign, relocate and brief able-bodied passengers, as required;

(viii) secure cabin;

(ix) check galley;

(x) check cabin;

(xi) check lavatory;

(xii) check crew rest area, if applicable;

(xiii) check remote area, if applicable;

(xiv) confirm “cabin readiness” to flight deck crew;

(xv) comply with signal from the flight deck crew;

(xvi) take assigned station or seat;

(xvii) check door status, if applicable;

(xviii) perform silent review;

(xix) comply with flight deck crew emergency communication;

(xx) take brace position;

(xxi) shout brace commands; and

(xxii) complete the applicable documentation.

(3) Apply procedures for an unanticipated or an unprepared emergency landing or ditching:

(a) where the tasks to be completed are similar to those covered in other topics, they will not be repeated here;

(b) identify the verbal and nonverbal signals and commands indicating an emergency situation;

(c) describe the procedure to take the assigned cabin crew station or seat;

(d) describe the procedure to follow if the cabin crew seat is occupied or the cabin crew member is unable to secure him or herself in the nearest available seat, and remain secured at the assigned station or seat;

(e) describe the importance of checking the door status;

(f) describe the importance of performing the silent review;

(g) describe the elements of the silent review, including:

(i) brace position;

(ii) emergency notification procedures;

(iii) location and operation of exits;

(iv) location of safety and emergency equipment and removal of equipment designated to the cabin crew station;

(v) passenger management and the visual identification of potential able-bodied passengers who may be able to assist in an emergency, number of passengers on board the aircraft, and special categories of passengers;

(vi) brace commands;

(vii) interior and exterior evacuation commands;

(viii) protective position while commanding the evacuation; and

(ix) brace and shout brace commands (with appropriate tone, pitch, volume and pace) once the flight deck crew signal is

received. This may include the use of the commands for the appropriate scenario (land vs ditching).

(h) this topic shall be successfully completed when a student is able to complete the following tasks:

(i) recognise an emergency signal from the flight deck crew;

(ii) take assigned station or seat;

(iii) check door status, if applicable;

(iv) perform silent review;

(v) comply with flight deck crew emergency communication;

(vi) take brace position;

(vii) shout brace commands; and

(viii) complete the applicable documentation.

2.2.6 Evacuation and rapid disembarkation

(1) Training objective

(a) A student shall be able to describe the different types of evacuation(s) and rapid disembarkation, cabin crew responsibilities and procedures relating to the different types of evacuation(s) and this includes:

(i) evacuation; and

(ii) rapid disembarkation.

(2) Evacuation

(a) Define “evacuation”.

(b) Describe historic incidents and accidents involving evacuation.

(c) Identify the types of emergencies which may require evacuation or rapid disembarkation, including –

(i) who is responsible for this decision;

(ii) the factors to be considered when making this decision;

(iii) the different types of emergency landings, that is anticipated or prepared and unanticipated or unprepared;

(iv) difference between a “ditching” and “unanticipated or unprepared water landing”;

(v) the different attitudes possible as a result of incidents or accidents and how this may affect exit usability such as gear collapse, for aircraft off the runway, shift in the centre of gravity;

(vi) the effect of environmental conditions in evacuations such as strong winds, terrain or snow or ice; and

(vii) management of an uncommanded evacuation.

(d) Identify the verbal and nonverbal signals and commands to initiate an evacuation and crew coordination.

(e) Describe scenarios when cabin crew members may initiate an evacuation.

(f) Describe the importance of checking exit status and assessing exits before opening.

(g) Describe the potential internal and external hazards.

(h) Describe the importance of identifying alternate exits and using all available exits and identify the evacuation procedures for each type of exit such as doors, windows, hatches, ventral exits and tailcones.

(i) Describe the emergency evacuation procedure of passengers for each of the following types of evacuation, including the applicable escape routes –

(i) land evacuation – anticipated or prepared and unanticipated or unprepared;

(ii) ditching evacuation – anticipated or prepared and unanticipated or unprepared;

(iii) evacuation at an airport gate or ramp jetway.

(j) Describe the differences in shouted commands for each type of evacuation and describe the rationale behind each of the commands, including ways to increase the effectiveness of commands, such as vocal tone, pace, volume, diction, body language and phraseology.

(k) Describe potential passenger problems in an evacuation, including –

(i) recognising and managing the different types of passenger behaviour (passive, aggressive, hysterical);

(ii) redirecting passengers, as necessary;

(iii) avoiding panic;

(iv) imparting confidence; and

(v) using verbal and nonverbal commands, adapted to the situation.

(l) Describe the importance of time management in an evacuation, how time affects survivability and other factors affecting survivability, including:

(i) fire, smoke or fumes;

(ii) water;

(iii) human behaviour;

(iv) fuselage damage; and

(v) any other danger.

(m) Describe the importance of the ability to respond in a hostile environment smoke, fire or darkness).

(n) Describe the responsibility of crew members to assist passengers, including the procedures to be applied with regards to special categories of passengers and injured occupants, and incapacitated fellow crew members in an evacuation and conditions when crew members should evacuate themselves in life-threatening situations.

(o) Describe the importance of situational awareness, as well as awareness of cabin crew member's own duties, the duties of other cabin crew members and the need to take over duties of fellow crew members when required.

(p) Describe the flotation characteristics of different aircraft and identify the factors which could adversely affect aircraft flotation in a water landing such as structural damage, weight, centre of gravity, and outside conditions.

(q) Describe different slide, slide raft and life raft operations with examples, including:

(i) activation and deployment of slide or slide rafts;

(ii) exit status appropriate to the evacuation;

(iii) methods for automatic and manual activation of exits, including alternate procedures if initial inflation fails and if the inflation fails during the course of the evacuation;

(iv) slide raft operation, boarding, supplementary survival kits, canopy installation, disconnection of slides or slide rafts, time management and seaworthiness;

(v) removal of life rafts from stowage points and positioning at exits, time management, harness attachment, attachment of static lines, raft buoyancy, raft release mechanism, danger of premature inflation of the life raft, distribution of supplementary survival kits, ejection of life rafts, inflation, boarding and seaworthiness;

(vi) transfer of slide raft from unusable exit to usable exit; and

(vii) identify the inflation times for the different evacuation aids, i.e. slides, ramps, slide or slide rafts, including how to recognise if an evacuation device is fully inflated.

(r) Describe the importance of checking the cabin, flight deck and lavatories after all passengers have been evacuated and describe how and under what conditions this shall be accomplished.

(s) Describe the cabin crew's responsibilities for the removal of equipment when they evacuate the aircraft, especially those that would enhance survivability, and under what conditions this should be accomplished.

(t) Describe the cabin crew members' responsibility after an evacuation (such as grouping passengers, assisting with first aid), including liaison with the airport emergency services and cooperating with local authorities. Include the following:

(i) first aid;

(ii) survival priorities;

(iii) survival equipment; and

(iv) signalling and recovery techniques.

(u) Describe the use of emergency signalling devices, including the importance of transmitting signals at the time of sunrise or sunset or moonrise or moonset as an aid in establishing position –

(i) emergency locator transmitter;

(ii) radio locator beacon; and

(iii) survival equipment.

(v) Describe the type of assistance that may be available at the various airports following an evacuation. Include ways cabin crew can manage the evacuation to coordinate their actions with the ground rescue services personnel.

(w) Describe post-evacuation procedures to increase survivability under all conditions, including general survival techniques, in:

(i) sea, including general aquatic survival techniques and physiological limitations in water;

(ii) jungle;

(iii) desert;

(iv) polar regions; and

(v) mountainous areas.

(x) Describe the following post-evacuation events and procedures:

(i) completion of applicable documentation such as incident report form;

(ii) dealing with different groups such as media, legal and accident investigators that will attempt to solicit information from cabin crew members; and

(iii) accident investigation, including the official groups tasked with accident investigation, internationally and nationally.

(3) Rapid disembarkation

(a) Define “rapid disembarkation”.

(b) Describe scenarios when a rapid disembarkation can be used, versus an evacuation, including historic incidents and accidents involving rapid disembarkation.

(c) Describe safety considerations when a rapid disembarkation is carried out on the apron;

(d) Describe the expected cooperation with local authorities such as airport emergency services and airport security.

(e) Describe the procedures for completing the applicable documentation, such as an incident report form.

2.2.7 Flight deck and cabin crew member incapacitation

(1) Training objective

(a) A student shall be able to identify and demonstrate the procedures for dealing with an incapacitated flight crew member and this includes:

(i) flight deck crew member incapacitation;

(ii) cabin crew member incapacitation; and

(iii) single cabin crew member incapacitation.

(2) Flight deck crew member incapacitation

(a) Define “incapacitated” as it relates to a flight deck crew member and identify possible causes such as illness, injury, physical and mental incapacitation, food poisoning, and death.

(b) Describe the impact on flight safety of an incapacitated flight deck crew member.

(c) Describe the preferred locations for relocating incapacitated flight deck crew members on different aircraft, if possible.

(d) Describe how and where to secure an incapacitated flight deck crew member for landing or during periods of in-flight turbulence.

(e) Describe the flight deck crew communication procedures to advise of flight deck crew member incapacitation.

(f) Describe the assistance cabin crew members shall be required to provide in the flight deck.

(g) Describe and demonstrate the procedures for assisting an incapacitated flight deck crew member.

(h) Describe and demonstrate the procedures for administering first aid oxygen to an incapacitated flight deck crew member.

(i) Describe the procedures for removing an incapacitated flight deck crew member from the flight deck, where manoeuvrability on the flight deck allows this.

(j) This topic shall be successfully completed when the student is able to perform the following tasks:

(i) respond to a call from the flight deck crew;

(ii) move the incapacitated flight deck crew member away from the controls;

(iii) secure the incapacitated flight deck crew member;

(iv) administer first aid;

(v) assist the remaining flight deck crew or PIC as instructed; and

(vi) complete the applicable documentation.

(3) Cabin crew member incapacitation

(a) Define “incapacitated” as it relates to a cabin crew member and identify possible causes such as illness, injury, physical and mental incapacitation, food poisoning and death.

(b) Describe the impact on flight safety of an incapacitated cabin crew member.

(c) Describe the preferred locations for relocating incapacitated cabin crew members on different aircraft, if possible.

(d) Describe the flight crew coordination procedure to ensure that the safety and emergency duties of the incapacitated cabin crew member are assumed and identify the person responsible for this decision.

(e) Describe and demonstrate the procedures for assisting incapacitated cabin crew members, including procedures for dealing with more than one incapacitated cabin crew member at a time.

(f) Describe and demonstrate the procedures for administering first aid oxygen to an incapacitated cabin crew member.

(g) This topic shall be successfully completed when a student is able to perform the following tasks:

(i) notify the flight deck crew immediately;

(ii) secure the incapacitated cabin crew member;

(iii) administer first aid;

(iv) assign an able-bodied passenger to assist the cabin crew member; and

(vi) complete the applicable documentation.

(4) Single cabin crew member incapacitation

(a) Describe preventive measures in case of any doubt of own fitness to perform tasks, including informing flight deck crew, selecting an able-bodied passenger and providing the necessary briefing.

(b) Describe the procedures associated with single cabin crew member incapacitation.

(c) Describe the procedures for administering first aid on oneself such as self-Heimlich manoeuvre.

(d) Describe the procedures for completing the applicable documentation, such as an incident report form.

2.2.8 Fuel dumping

(1) Training objective

(a) A student shall be able to recognise the characteristics associated with fuel dumping and be able to follow established procedures.

(2) Fuel dumping

(a) Define “fuel dumping”.

(b) Describe the conditions under which fuel dumping may occur.

(c) Describe the need for flight deck crew communication during fuel dumping and the responsibility of cabin crew members to report any unusual conditions to a PIC.

(d) Describe the advice to passengers regarding fuel dumping and the person responsible for this advice.

2.2.9 Propeller abnormalities

(1) Training objective

(a) A student shall be able to identify the characteristics of an over speeding propeller and be aware of the procedures associated with these situations.

(2) Propeller abnormalities

(a) Define “over speeding or runaway propeller”.

(b) Describe the emergencies that may occur as a result.

(c) Describe how to recognise propeller malfunctions and their effect on flight characteristics.

(d) Describe the cabin crew procedures associated with these propeller abnormalities.

3. Practical training for initial cabin crew member licence

(1) Scenario-based training allows an ATO to simulate realistic cabin conditions where errors may occur.

(2) Scenario-based training allows students the opportunity to look at specific situations under certain conditions and aims to recreate, to the extent possible, those conditions and situations that cabin crew members could encounter on the line.

(3) Scenario-based training allows students to apply knowledge and skills in the context of performing their actual tasks.

(4) The cabin crew instructor shall demonstrate the drill(s) to the students prior to their participation in the drill(s) and this shall allow a student to witness theory being put into practice.

(5) The practical training shall be conducted in an environment similar to the assessment environment and representative of the operating environment.

(6) Except for live firefighting, training for drills and assessment of drills may not take place on the same day.

3.1 Training syllabus

(1) The practical training syllabus shall consist of the following aspects:

(a) normal operations practical drills; and

(b) abnormal and emergency procedures practical drills.

(2) The practical training syllabus shall further consist of the following subjects, at a minimum:

(a) public address announcements;

(b) safety demonstration;

(c) passenger briefings;

(d) safety equipment pre-flight checks;

(e) safety equipment use;

(f) pre-take off checks;

(g) pre-landing checks;

(h) post landing duties;

(i) anticipated or prepared emergency landing or ditching;

(j) unanticipated or unprepared emergency landing or ditching;

(k) live firefighting;

(l) simulated firefighting;

(m) wet ditching;

(n) pilot incapacitation; and

(o) cabin crew member incapacitation.

3.2 Contents of training syllabus

3.2.1 Public address announcements

(1) Training objective

(a) A student shall deliver an announcement demonstrating effective use of the voice and vocal techniques, such as volume, pace, tone, inflection and resonance.

(b) A student shall deliver the mandatory announcements demonstrating familiarity with the content and knowledge of the appropriate time to deliver such announcements.

(c) A student shall convey a message while being cognisant of the importance of vocal quality in effective communication.

(2) Performance criteria

(a) A student shall demonstrate communication techniques on a public address system and deliver at least one published announcement.

(b) A student shall demonstrate communications techniques on a public address system and perform the following:

(i) remove the microphone from its stowage;

(ii) activate the PA system, and, if applicable, verify that it is activated;

(iii) deliver at least one published safety or emergency announcement;

(iv) deactivate or reset the system after use; and

(v) restow the microphone after use.

(c) A drill shall be successfully completed when a student completes the following tasks competently:

(i) correct announcement selected;

(ii) appropriate use of terminology;

(iii) correct pronunciation of words;

(iv) appropriate use of volume;

(v) appropriate use of pace;

(vi) appropriate use of tone;

(vii) appropriate use of inflection;

(viii) appropriate use of pitch and resonance;

(ix) message clearly delivered; and

(x) message clearly received by listener.

3.2.2 Safety demonstration

(1) Training objective

(a) A student shall perform a full passenger pre-flight safety demonstration, such as seat belts, exits, oxygen, life jacket, floor level lighting, signs and safety features card.

(2) Performance criteria

(a) Demonstrate how to use equipment representative of the equipment used on aircraft, during the safety demonstration.

(b) A student shall perform the safety demonstration showing correct usage and simulation of the operation of each item of demonstration equipment.

(c) A drill shall be successfully completed when the student completes the following tasks competently:

(i) displays confidence and leadership during the demonstration;

(ii) uses appropriate eye contact and body language;

(iii) synchronises demonstration with announcement; and

(iv) correctly uses and simulates the operation of each item of demonstration equipment.

3.2.3 Passenger briefings

(1) Training objective

(a) A student shall deliver briefings to different types of passengers on board an aircraft.

(2) Performance criteria

(a) A student shall deliver a pre-flight safety briefing to a special category passenger such as person with disability, unaccompanied minor, parent with infant or pregnant woman.

(b) A student shall deliver a pre-flight safety briefing to a passenger seated at an exit row.

(c) A drill shall be successfully completed when a student completes the following tasks competently:

(i) identify the correct briefing to be completed;

(ii) complete each briefing correctly, including all relevant points;

(iii) correctly modify the briefing according to the individual passenger's knowledge, requirements and needs;

(iv) use communication techniques effectively (absence of jargon, clear and precise communication);

(v) appropriate use of body language, gestures and eye contact;

(vi) appropriate simulation of the operation of relevant equipment;

(vii) verifies understanding of briefing points; and

(viii) demonstrates an ability to answer questions.

3.2.4 Safety equipment pre-flight checks

(1) Training objective

(a) A student shall perform pre-flight checks correctly on safety equipment found on board an aircraft.

(2) Performance criteria

(a) Each student shall perform the applicable safety equipment checks to ensure that all equipment is available and serviceable.

(b) The following equipment shall be checked appropriately –

(i) portable oxygen;

(ii) first aid kit;

(iii) flashlight;

(iv) crew life jacket;

(v) extra life jackets – adult;

(vi) extra life jackets – infant;

(vii) fire extinguisher;

(viii) Portable Breathing Equipment (PBEs);

(ix) fire gloves; and

(x) fire axe.

(c) The drill shall be successfully completed when the student completes the following tasks competently:

(i) identify the correct piece of equipment; and

(ii) correctly complete the pre-flight checks for each piece of equipment.

3.2.5 Safety equipment use

(1) Training objective

(a) A student shall correctly use the safety equipment found on board an aircraft.

(2) Performance criteria

(a) A student shall physically demonstrate the use of the applicable safety equipment.

(b) The use of the following safety equipment shall be demonstrated:

(i) Portable oxygen –

(aa) portable oxygen bottle(s) used shall be representative of the type(s) typically used on aircraft;

(bb) a student shall:

(Aa) remove the bottle from the bracket stowage;

(Bb) retrieve the oxygen mask and hose and attach it to the high flow outlet;

(Cc) approach a passenger while carrying the portable oxygen bottle, using the carrying strap;

(Dd) prepare the passenger for receiving oxygen;

(Ee) turn on the oxygen and test for flow then position and secure the mask to the passenger's face;

(Ff) secure the oxygen bottle and position it to monitor the supply;

(Gg) recognise when oxygen is no longer required and apply procedures for shutting off the supply and restowing the oxygen mask and bottle.

(ii) Flashlight:

(aa) a student shall demonstrate the use of a flashlight in dark conditions; and

(bb) a student shall demonstrate the use of a flashlight in smoke-filled conditions.

(iii) Crew life jacket –

(aa) a student shall:

(Aa) don a life jacket, representative of the type typically used on aircraft;

(Bb) inflate the life jacket using the oral mouth piece;

(Cc) deflate the life jacket;

(Dd) locate and review the light activation;

(Ee) locate the whistle;

(Ff) fit an adult life jacket on a child or mannequin of representative size; and

(Gg) an adult life jacket used shall be representative of the type typically found on board aircraft.

(iv) An infant life jacket:

(aa) an infant life jacket used shall be representative of the type typically found on board aircraft;

(bb) a student shall demonstrate the fitting of an infant life jacket to a mannequin of representative size.

(v) Fire extinguisher:

(aa) a fire extinguisher used shall be representative of the type typically found on board aircraft;

(bb) a student shall:

(i) remove the bottle from the bracket stowage;

(ii) simulate the breaking of the seal used on the fire extinguisher; and

(iii) simulate the procedure used to release the extinguishant.

(vi) PBEs –

(aa) portable breathing equipment used shall be representative of the type(s) typically found on board aircraft;

(bb) a student shall:

(i) remove the PBE from its casing;

(ii) identify all features of the PBE;

(iii) don the PBE and secure it correctly to the body;

(iv) demonstrate the ability to communicate while wearing the PBE;

(v) demonstrate the removal of the PBE from the body;

(vi) don at least two different types of PBE as part of practical training; and

(vii) view videos of the use of any PBEs that they have not personally donned.

(vii) Fire gloves –

(aa) a student shall demonstrate the use of the fire gloves.

(viii) Megaphone –

(aa) megaphone used shall be representative of the type typically found on board aircraft;

(bb) a student shall:

(c) identify all features of the megaphone;

(d) demonstrate the method of communicating using the megaphone; and

(e) demonstrate the method of volume control on the megaphone.

3.2.6 Pre-take off checks

(1) Training objective

(a) A student shall perform a cabin check prior to take off of an aircraft.

(2) Performance criteria

(a) A student shall verbally describe the ability to perform a cabin check prior to take-off.

(b) A drill shall be successfully completed when a student verbally describe the following tasks competently –

(i) seat belts fastened;

(ii) seat backs in upright position;

(iii) tray tables stowed;

(iv) arm rests down;

(v) cabin baggage correctly stowed;

(vi) overhead bins closed;

(vii) exit rows free of obstruction;

(viii) parents with infants seated correctly;

(ix) electronic devices in the correct mode;

(x) foot rests stowed;

(xi) special categories of passengers briefed;

(xii) non-crewed exit rows briefed;

(xiii) cabin doors correctly closed and armed;

(xiv) cabin lighting set;

(xv) galley equipment secured;

(xvi) music system switched off;

(xvii) toilets clear and locked;

(xviii) window blinds open;

(xix) passenger head count completed; and

(xx) flight deck crew advised that the cabin is sterile.

3.2.7 Pre-landing checks

(1) Training objective

(a) a student shall perform a cabin check prior to landing of an aircraft.

(2) Performance criteria

(a) a student shall verbally describe the ability to perform a cabin check prior to take off.

(b) a drill shall be successfully completed when a student verbally describe the following tasks competently:

(i) seat belts fastened;

(ii) seat backs in upright position;

(iii) tray tables stowed;

(iv) arm rests down;

(v) cabin baggage correctly stowed;

(vi) overhead bins closed;

(vii) exit rows free of obstruction;

(viii) parents with infants seated correctly;

(ix) electronic devices in the correct mode;

(x) foot rests stowed;

(xi) non-crewed exit rows briefed;

(xii) cabin doors correctly closed and armed;

(xiii) cabin lighting set;

(xiv) galley equipment secured;

(xv) music system switched off;

(xvi) toilets clear and locked;

(xvii) window blinds open; and

(xviii) flight deck crew advised that the cabin is sterile.

3.2.8 Post landing duties

(1) Training objective

(a) a student shall perform duties after the aircraft has landed and turned off the active runway.

(2) Performance criteria

(a) a student shall verbally describe the ability to perform duties after an aircraft has landed and the flight has ended.

(b) a drill shall be successfully completed when a student verbally describes the following tasks competently:

(i) remain in assigned station or seat and remain secure in required position;

(ii) comply with ordinance signs and instructions from the flight deck crew;

(iii) check passenger compliance with ordinance signs and instructions;

(iv) monitor cabin;

(v) follow procedure for disarming, checking and opening of aircraft doors, as applicable;

(vi) manage passenger disembarkation process;

(vii) perform security checks, if applicable; and

(vii) complete the applicable documentation.

3.2.9 Unanticipated or Unprepared emergency landing or ditching

(1) Training objective

(a) a student shall perform at least one unanticipated or unprepared landing and unanticipated or unprepared ditching simulated emergency.

(2) Performance criteria

(a) To ensure understanding of operational differences, a drill shall be performed with cabin crew members in a multi-crew environment and also single cabin crew member environment.

(b) Where the multi-crew drill is performed, the number of cabin crew members that could participate at any time shall be appropriate to the cabin simulator configuration.

(c) A student shall assume an actual crew position and shall perform the designated evacuation responsibilities for that position.

(d) Where a double cabin crew member seat is available and would normally be occupied by two crew members the drill shall be conducted to reflect this reality.

(e) A drill variables may include but are not limited to:

(i) unserviceable exits;

(ii) inflation devices that fail or only partially inflate;

(iii) aircraft attitude which necessitates a decision to use a particular exit or redirect passengers;

(iv) poor visibility such as darkness or smoke;

(v) incapacitated flight crew members;

(vi) exits which become unusable during the evacuation;

(vii) passengers in panic;

(viii) failure of aircraft emergency systems such as lighting, evacuation and communication signal;

(ix) decompression; and

(x) situation requiring altering of commands.

(f) A drill shall be successfully completed when a student completes the following tasks competently:

(i) secures himself or herself in a cabin crew member seat;

(ii) recognises that an emergency situation is developing and responds appropriately to the scenario;

(iii) applies all applicable commands;

(iv) responds appropriately to the “Brace” command or signal;

(v) recognises when and how to respond to the “Evacuate” command or signal;

(vi) activates the emergency lights (if applicable);

(vii) assesses conditions inside and outside the exit to determine exit usability throughout the evacuation;

(viii) locates and dons life jacket, as applicable;

(ix) commands passengers to prepare for evacuation;

(x) prepares and opens exit;

(xi) secures exit in fully open position;

(xii) assumes appropriate protective position;

(xiii) initiates passenger evacuation;

(xiv) controls passenger flow throughout evacuation;

(xv) performs final cabin and flight deck checks;

(xvi) removes necessary safety equipment;

(xvii) exits aircraft or simulator correctly.

3.2.10 Anticipated or Prepared emergency landing or ditching

(1) Training objective

(a) A student shall perform at least one anticipated or prepared land and one anticipated or prepared water ditching simulated scenario.

(2) Performance criteria

(a) To ensure an understanding of operational differences, the drill shall be performed with students in a multi-crew environment and also a single cabin crew member environment.

(b) Where the multi-crew drill is performed, the number of students that could participate at any time shall be appropriate to the cabin simulator configuration.

(c) A student shall assume an actual crew position and shall perform the designated evacuation responsibilities for that position.

(d) Where a double cabin crew member seat is available and would normally be occupied by two crew members the drill shall be conducted to reflect this reality.

(e) A drill variables may include but are not limited to:

(i) unserviceable exits;

(ii) inflation devices that fail or only partially inflate;

(iii) aircraft attitude which necessitates a decision to use a particular exit or redirect passengers;

(iv) poor visibility, i.e. darkness or smoke;

(v) incapacitated flight crew members;

(vi) exits which become unusable during the evacuation;

(vii) passengers in panic;

(viii) failure of aircraft emergency systems such as lighting, evacuation and communication signal;

(ix) decompression; and

(x) situation requiring altering of commands.

(f) A drill shall be successfully completed when a student completes the following tasks competently:

(i) recognises emergency signal from the flight deck crew;

(ii) obtains briefing from the flight deck crew on the situation;

(iii) stow service-related items and stands-by for further instructions;

(iv) briefs cabin crew on the situation;

(v) briefs passengers;

(vi) dons life jacket, in case of ditching;

(vii) assign, relocate and brief able-bodied passengers, as required;

(viii) secure cabin;

(ix) check galley;

(x) check cabin;

(xi) check lavatory;

(xii) check crew rest area, if applicable;

(xiii) check remote area, if applicable;

(xiv) confirm “cabin readiness” to the flight deck crew;

(xv) comply with signal from the flight deck crew;

(xvi) take assigned station or seat;

(xvii) check door status, if applicable;

(xviii) perform silent review;

(xix) comply with flight deck crew emergency communication;

(xx) take brace position;

(xxi) shout brace commands;

(xxii) simulate the evacuation of the aircraft successfully; and

(xxiii) complete the applicable documentation.

3.2.11 Simulated firefighting

(1) Training objective

(a) A student shall extinguish simulated fires using the relevant equipment, firefighting techniques and procedures.

(2) Performance criteria

(a) A cabin crew member’s ability to successfully respond to different fire situations shall enhance his or her level of confidence and ability to deal with fire in-flight.

(b) Fire extinguishers used for simulated firefighting shall be representative of the actual fire extinguishers found on board an aircraft.

(c) A training PBE does not have to be operational but shall be representative of the actual smoke hoods used by operators in the Republic.

(d) Fire gloves used for simulated firefighting shall be similar to or the same as those found on board an aircraft.

(e) Simulated firefighting drills shall be conducted using furnishings representative of those found on an aircraft, such as seats, galley units, panels and waste bins.

(f) Simulated firefighting drills, from any of the known fire classes, shall be conducted in each of the following locations:

(i) cabin area – under seat or seat, if electrically operated, overhead bin or closet; and

(ii) galley area – garbage bin, upper electrical panel or oven; and

(iii) confined area – lavatory waste bin; and

(iv) hidden area – behind panels

(g) A drill shall be successfully completed when a student competently completes the following tasks:

(i) recognises or identifies the problem;

(ii) correctly locates the source of the fire, using the appropriate technique and equipment;

(iii) uses effective communication, and coordination procedures throughout the drill such as notifying fellow flight crew members of the situation, establishing and maintaining communication with the flight deck crew, providing clear, concise information to a PIC and relocating passengers;

(iv) follows the correct procedures for communication and coordination throughout the drill;

(v) effectively demonstrates the use of an actual fire extinguisher, while wearing the relevant and applicable PBE and gloves;

(vi) follows appropriate extinguishing and post fire monitoring procedures; and

(vii) completes documentation correctly.

3.2.12 Live firefighting

(1) Training objective

(a) A student shall extinguish live fire using the relevant equipment and firefighting techniques.

(2) Performance criteria

(a) A cabin crew member's ability to successfully respond to different fire situations shall enhance his or her level of confidence and ability to deal with in-flight fire.

(b) Fire extinguishers used for live firefighting shall be charged with an environmentally friendly agent.

(c) A training PBE does not have to be operational but shall be representative of an actual smoke hood.

(d) Firefighting drills shall be conducted using furnishings representative of those found on an aircraft, such as seats, galley units, panels, waste bins.

(e) Live firefighting drills, from any of the known fire classes, shall be conducted in each of the following locations:

(i) cabin area – under seat, seat (if electrically operated), overhead bin or closet; and

(ii) galley area – garbage bin, upper electrical panel or oven;

(iii) confined area – lavatory waste bin; and

(iv) hidden area – behind panels.

(f) A drill shall be successfully completed when a student competently completes the following tasks –

(i) recognises or identifies the problem;

(ii) correctly locates the sources of the fire using the appropriate technique and equipment;

(iii) uses effective communication and coordination procedures throughout the drill such as notifying fellow flight crew members of the situation, establishing and maintaining communication with the flight deck crew, providing clear, concise information to a PIC, relocating passengers;

(iv) effectively uses an actual fire extinguisher, correctly applied to an actual fire, while wearing PBE;

(v) correctly uses firefighting equipment consistent with the type of fire, location of the fire and maximum effective position of the fire extinguisher; and

(vi) follows appropriate extinguishing and post fire monitoring techniques.

3.2.13 Wet ditching

(1) Training objective

(a) A student shall protect and sustain his or her safety in water, while assisting passengers to do the same.

(2) Performance criteria

(a) A student shall identify the pouch that a life jacket is stowed in.

(b) Life jackets used for this drill shall be representative of the type typically found on board an aircraft.

(c) A student shall identify the container or carrier that a life raft is stowed in.

(d) A student shall participate in the following:

(i) examine all features of a fully inflated life raft;

(ii) identify the inflation lanyard;

(iii) identify the quick release mechanism while verbally describing the procedure to release the life raft from an aircraft;

(iv) examine the life raft survival kit and review the operation of all components;

(v) witness the launching, inflating and disconnecting of the life raft and this may be either actual or by video;

(vi) effective life raft management such as distribution of passengers, deploying sea anchor, erecting the canopy, assigning duties to passengers, maintaining the life raft;

(e) A drill shall be successfully completed when each student performs the following tasks competently:

(i) don a life jacket and secure it to the body correctly;

(ii) inflate the life jacket using the manual inflation tube;

(iii) enter the water within 5 seconds of being given the command to do so;

(iv) assume the individual Heat Escape Lessening Posture for a minimum of 10 seconds in water;

(v) assume the group huddle position for a minimum of 15 seconds in water;

(vi) move in water for a minimum distance of 15 metres. This distance shall be covered in no longer than 2 minutes; and

(vii) board the raft, from water, without any assistance, within 10 minutes of being given the command to do so.

3.2.14 Pilot incapacitation

(1) Training objective

(a) A student shall apply the procedures relating to an incapacitated pilot.

(2) Performance criteria

(a) The exercise shall be performed using either an actual flight deck crew seat or one that is representative of a flight deck crew seat with all the required control mechanisms.

(b) A drill shall be successfully completed when the student performs the following tasks competently:

(i) pull a pilot away from the flight controls;

(ii) correctly fasten and lock the restraint system;

(iii) position a pilot seat using the controls either in horizontal, vertical, recline;

(iv) administer first aid as necessary; and

(v) apply crew co-ordination and communication procedures to assist the remaining flight deck crew member.

3.2.15 Cabin crew member incapacitation

(1) Training objective

(a) A student shall apply the procedures relating to an incapacitated cabin crew member in a multi-crew and single cabin crew environment.

(2) Performance criteria

(a) The exercise shall be performed using either an actual aircraft seat or one that is representative of an aircraft seat with all the required control mechanisms.

(b) The exercise shall be performed for a multi-crew environment.

(c) The exercise shall be described and discussed for a single cabin crew environment, to ensure that the cabin crew student is exposed to different operating environments.

(d) A drill shall be successfully completed when a student performs the following tasks competently:

(i) administer first aid;

(ii) secure the incapacitated cabin crew member;

(iii) inform the flight deck crew;

(iv) reassign required cabin crew stations, if applicable; and

(v) complete the applicable documentation.

4 Security awareness training for an initial cabin crew member licence

(1) A security awareness training programme addresses procedures related to cabin crew members' security-related tasks.

(2) The goal of security awareness training is to enable cabin crew members to identify and respond appropriately to various security threats to prevent and minimise the consequences of acts of unlawful interference.

(3) A student shall be trained in the requirements commensurate with his or her responsibilities, as provided in these Technical Standards and in terms of Part 109 of the Regulations.

4.1 Training syllabus

(1) The security awareness training programme shall consist of the following aspects:

(a) general security awareness;

(b) preventive measures during normal operations; and

(c) response to acts of unlawful interference.

(2) The security awareness training programme shall further include the following subjects, as a minimum:

(a) aviation legislation and security programmes, including international, national, airport and aircraft operator requirements;

(b) determination of the seriousness of any occurrence;

(c) crew communication and coordination;

(d) appropriate self-defence responses;

(e) use of non-lethal protective devices assigned to crew members;

(f) new terrorist profiles;

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

(h) live situational training exercises regarding various threat conditions;

(i) procedures for aircraft security checks and/or searches;

(j) flight crew compartment procedures to protect the aircraft;

(k) aircraft search procedures and guidance on least-risk bomb locations where practicable; and

(l) procedures in handling passengers who have been the subject of judicial or administrative proceedings.

4.2 Contents of training syllabus

4.2.1 General security awareness

(1) Training objective

(a) A student shall describe the requirement to comply with minimum aviation security standards prescribed by the Authority.

(2) General

(a) Describe the history of the development of ICAO Annex 17 with respect to aviation security.

(b) Describe the role and responsibilities of aerodrome operators, police and other agencies in the management of a security incident.

(c) Define the following terms used in security:

(i) the Act;

(ii) act of unlawful interference;

(iii) bomb threat;

(iv) explosive disposal expert;

(v) firearm;

(vi) hijacking;

(vii) inadmissible person;

(viii) juvenile delinquent;

(ix) peace officer;

(x) prisoner;

(xi) sabotage;

(xii) sterile area;

(xiii) stowaway; and

(xiv) weapon.

(d) Discuss the importance of situational awareness in maintaining security both on the ground and onboard an aircraft.

(e) Discuss the importance of situational awareness in maintaining discretion both privately and professionally.

(f) Discuss the requirement to report incidents.

(g) Describe and practise the information required at the time of reporting a security related incident.

4.2.2 Preventive measures during normal operations

(1) Describe the responsibility of holders of airport restricted areas passes, including the requirement to challenge persons in restricted areas who are not wearing passes.

(2) Discuss the measures in place to protect and identify cabin crew members' personal belongings.

(3) Discuss the measures in place to protect the air service operator's property manuals, permits, uniforms and other documents or items.

(4) Discuss the communication protocol regarding any incidents involving the air service operator.

(5) Describe the measures in place related to screening and transportation of passengers, baggage, cargo, mail, equipment, catering, stores and supplies intended for carriage on an aircraft.

(6) Identify the differences between pre-flight safety checks and pre-flight security checks of the cabin or galley equipment and monitoring of passengers during the boarding process.

(7) Describe the measures to prevent unauthorised access to the fight deck while in flight.

(8) Describe the measures to prevent unauthorised access to an aircraft not in service.

(9) Describe the cabin post-flight checks and inspections of an aircraft after landing.

(10) Discuss the importance of communication between flight crew members regarding possible threats to security.

4.2.3 Response to acts of unlawful interference

(1) Management of unruly passengers

(a) Discuss the importance of communication with the flight deck crew during an act of unlawful interference and the type of information that should be conveyed such as threat level, number of perpetrators, any weapons, physical description of a perpetrator and assigned seat number;

(b) Discuss the different threat levels that are prevalent in industry and practice appropriate crew responses;

(c) Describe the means of identifying and procedures for managing different passenger behaviours which may interfere with the normal operation of the aircraft and threaten the safety and well-being of passengers and crew members. This may include conflict management and conflict resolution, de-escalation techniques, as well as examples of unruly behaviour, such as harassment, verbal abuse, physical assault, intimidating behaviour, intoxicated and disorderly conduct, disregard of smoking regulations, consuming own “carry on” alcoholic beverages, refusal to follow instructions of the crew and endangering the safety of an aircraft;

(d) Describe and practise the relevant documentation to be completed such as reports, witness statements and notification cards to unruly passengers;

(e) Discuss and practice appropriate self-defence responses;

(f) Discuss and practice the use of non-lethal protective devices assigned to crew members;

(g) Discuss and practise the use of able-bodied passengers, their roles and responsibilities in relation to cabin crew during an incident.

(2) Bomb threat or bomb on board in flight or on the ground

(a) Demonstrate an understanding of the components of an explosive device and the different types of explosives;

(b) Discuss the evolution of improvised explosive devices, including awareness of threat evolution;

(c) Describe the necessity of being vigilant for security concerns such as thorough and frequent checks of any accessible compartments, including non-crewed galleys, cabin and lavatories;

(d) Discuss the awareness of other available resources in the event of suspicious items or a bomb discovered on board;

(e) Describe the possible procedures for the handling of suspicious items on board while an aircraft is in flight;

(f) Describe the possible procedures for the handling of bomb threat or bomb on board during a flight;

(g) Describe the various procedures for notifying the flight deck crew of an act of unlawful interference inside the cabin, including the presence of suspicious items;

(h) Describe the checklists for an aircraft search and how to use them;

(i) Discuss the possible passenger reactions to security incidents;

(j) Describe the possible procedures for rapid disembarkation and evacuation; and

(k) Describe the various procedures for completing the applicable documentation, such as an incident report form.

(3) Bomb threat or bomb on board on ground

(a) Describe the possible procedures for the handling of suspicious items on board while an aircraft is on the ground.

(b) Describe the possible procedures for the handling of a bomb threat or bomb on board on the ground.

(c) Describe the possible procedures for notifying the flight deck crew of an act of unlawful interference inside the cabin, including the presence of suspicious items.

(d) Describe the various procedures for the application of security checks.

(e) Describe the various procedures for rapid disembarkation and evacuation.

(f) Describe the possible procedures for completing the applicable documentation, such as incident report form.

(4) Apply procedures in case of hijacking

(a) Describe the importance of situational awareness and of being vigilant and observant when security concerns are suspected.

(b) Describe the procedures for dealing with hijackers and understanding their intentions and expected behaviours.

(c) Describe the techniques for managing distressed passengers.

(d) Discuss the importance of monitoring the cabin for additional threats.

(e) Describe the symptoms and behaviours associated with situations of captivity, such as a hijacking such as Stockholm syndrome.

(f) Describe the procedures related to flight deck door and flight crew actions.

(g) Discuss the use of resources during security-related emergencies.

(h) Discuss the different means of communications with the ground.

(i) Discuss the procedures for hijack resolution.

(j) Describe and practise the procedures for completing the applicable documentation, such as an incident report form.

(5) Apply procedures for chemical, biological or radiological incidents.

(a) Describe the signs and symptoms of chemical, biological and radiological (CBR) agent exposure.

(b) Discuss the importance of cabin surveillance to detect suspicious behaviour or items.

(c) Describe the distinction between handling dangerous goods, explosive devices and CBR agents, and associated procedures.

(d) Describe the importance of containing the CBR agents' aerosol potential before it spreads.

(e) Describe and practice the procedures for in-flight CBR incidents.

(f) Describe and practice the procedures for completing the applicable documentation, such as an incident report form.

(6) Dangerous goods awareness training for an initial cabin crew member licence

(a) Dangerous goods training focuses on the successful application of regulations concerning the transport of dangerous goods and the achievement of their objectives, which are greatly dependent on the appreciation of the risks involved and of a detailed understanding of Part 92 of the regulations.

(b) Students shall be trained in the requirements commensurate with their responsibilities, as detailed in Part 92 of the regulations.

(7) Cabin health and first aid training for an initial cabin crew member licence.

(a) Cabin crew members are required to manage medical events and administer first aid to passengers and crew members.

(b) Cabin crew training shall also include procedures for the universal precaution kit (UPK), signs and symptoms, and action required

when dealing with a suspected or actual case of a communicable disease.

(c) Cabin crew members shall have a basic understanding of the human anatomy and physiology.

(d) First aid training shall include the management of commonly occurring medical conditions and cardiopulmonary resuscitation (CPR).

(e) Cabin crew members shall recognise a medical emergency and provide first aid until trained medical help is available, from on-board health professionals, ground-based support teams (remote assistance) or from care providers after landing.

(f) Cabin crew members shall be competent in the content and appropriate use of any first aid equipment that is carried.

(g) Cabin crew members shall be familiar with the contents of the first aid kit carried on an aircraft and support a health care professional who volunteers assistance.

(h) Cabin crew members shall also understand the basic principles of on-board hygiene.

(i) In order for cabin crew members to perform their tasks, they require an understanding of the potential stresses and health risks associated with their work, such as the effect of altitude and fatigue.

5. Training syllabus

(1) Cabin health and first aid training shall include the following topics:

(a) principles of first aid;

(b) management of on-board medical events;

(c) food safety;

(d) cabin disinsection;

(e) altitude physiology (covered in Normal Operations training); and

(f) fatigue (covered in Section 2, Human Performance training).

6. Contents of training syllabus

6.1 Principles of first aid

(1) Training objective

(a) A cabin crew member shall identify and demonstrate the principles of first aid required to effectively handle an in-flight medical emergency situation.

(2) This topic shall be successfully completed when a cabin crew member understands the following:

(a) the three objectives of first aid –

(i) to preserve life;

(ii) to prevent the condition from worsening; and

(iii) to promote recovery

(b) definitions –

(i) **"anatomy"** – what the body consists of;

(ii) **"barotraumas"** – trauma involving changes in air pressure;

(iii) **"brachial"** – artery on upper inner arm or brachial pressure point;

(iv) **"cardiac arrest"** – a heart that has stopped;

(v) **"CPR"** – cardio pulmonary resuscitation;

(vi) **"carotid"** – artery in the neck on either side of airway;

(vii) **"cervical vertebrae"** -neck

(viii) **"distal"** – a point on an extremity further away from the trunk;

(ix) **"fracture"** – break in the bone;

(x) **"femoral"** – artery in the groin or femoral pressure point;

(xi) **"gastric"** – stomach;

(xii) **"history"** – what happened before, or to cause the problem;

(xiii) **"physiology"** – how the body works;

(xiv) **"radial pulse"** – wrist pulse;

(xv) **"respiration"** – breathing;

(xvi) **"signs"** – what you see on the person; and

(xvii) **"symptoms"** – what the person feels and describes.

(c) responsibility of cabin crew members when providing first aid;

(d) difference between a sign and a symptom;

(e) first aid equipment and material available on board an aircraft;

(f) location, pre-flight check and use of first aid and medical equipment;

(g) potential aviation-associated health risks –

(i) cosmic radiation; and

(ii) cabin air quality.

6.2 Management of on-board medical events

(1) Training objective

(a) A cabin crew member shall define and demonstrate the in-flight medical emergency scheme management required to effectively handle an in-flight medical emergency situation.

(b) A cabin crew member shall understand and recognise the following:

(i) common signs and symptoms of passenger illness in-flight;

(ii) signs and symptoms of immediate life-threatening medical events such as signs of choking, collapse, unconsciousness, severe allergic reactions (anaphylaxis);

(iii) signs and symptoms of hyperventilation;

(iv) signs and symptoms of panic attack;

(v) signs and symptoms of drug use combined with alcohol intoxication;

(vi) main signs and symptoms of communicable diseases;

(vii) regulations concerning communicable diseases;

(viii) procedures for specific on-board medical events, including managing assistance from on-board volunteer health professionals;

(ix) specific crew member responsibilities for on-board medical events and the importance of being prepared to apply appropriate procedures;

(x) importance of crew communication and co-ordination in responding to on-board medical events and communication with the flight deck crew members, qualified on-board health professionals and ground-based medical assistance providers;

(xi) actions to assess and manage potential communicable disease, including using universal precautions such as personal protective equipment, cleaning up spilled body fluids;

(c) This topic shall be successfully completed when the cabin crew member is able to complete the following tasks competently:

(i) monitor the cabin to identify ill or injured passengers;

(ii) recognise an on-board medical event;

(iii) determine if the event is life-threatening;

(iv) respond immediately to a life-threatening on-board medical event;

(v) respond to other non-life-threatening events using appropriate first-aid techniques;

(vi) assess and manage suspect cases of communicable disease;

(vii) apply communication procedures;

(viii) apply procedures for seeking ground-based medical and on-board volunteer health professional assistance;

(ix) use first aid and medical equipment, as appropriate;

(x) manage assistance from an on-board volunteer health professional, if available; and

(xi) support the on-board volunteer health professional, as appropriate.

6.3 Food safety

(1) Training objective

(a) A cabin crew member shall take appropriate actions to minimise or prevent the contamination of food and related service items.

(b) A cabin crew member shall understand and recognise the following:

(i) general principles of food contamination prevention;

(ii) signs of food contamination;

(iii) signs and symptoms of food poisoning;

(iv) criteria by which food poisoning can be suspected such as multiple passengers becoming ill after eating the same meal choice;

(v) principles of first aid to manage suspected food poisoning;

(vi) details of food poisoning protocol; and

(vii) procedures for completing the applicable documentation, such as an incident report form.

(c) This topic shall be successfully completed when the cabin crew member is able to complete the following tasks competently:

(i) minimise or prevent the contamination of food and related service items;

(ii) ensure safe practices for food safety;

(iii) manage suspected food poisoning; and

(iv) complete the applicable documentation.

6.4 Cabin disinsection

(1) Training objective

(a) A cabin crew member shall carry out disinsection procedures, as appropriate.

(2) A cabin crew member shall understand and recognise the following:

(a) definition of disinsection and the difference between disinsection and disinfection;

(b) reasons for disinsection of aircraft cabins;

(c) who sets the requirements for disinsection such as national authorities;

(d) health complaints that may be caused by disinsection procedures; and

(e) description of ways in which crew or passengers can limit their exposure to chemical disinsectants.

(3) This topic shall be completed successfully when the cabin crew member completes the following tasks competently:

(a) advise passengers on disinsection procedures; and

(b) carry out disinsection of the aircraft cabin.

7. Human performance training for an initial cabin crew member licence

(1) Human performance is defined as the human capabilities and limitations which have an impact on the safety and efficiency of aeronautical operations.

(2) Human performance training focuses on relationships between people and equipment, systems, procedures, and the environment, as well as personal relationships between individuals and groups it encompasses, and the overall performance of cabin crew members while they carry out their duties.

(3) The goal of this training is to optimise human performance and manage human error. It encompasses human factors principles, crew resource management, and the development and application of competencies.

(4) Human performance training should be oriented towards recognising and solving practical problems.

7.1 Training syllabus

(1) Human performance training shall include the following topics:

(a) human factors in aviation;

(b) human error;

(c) cabin crew competencies;

(d) crew resource management;

(e) threat and error management;

(f) fatigue management; and

(g) human performance in relation to SMS.

(2) Training shall include the following case studies:

(a) contributing role that cabin crew members have played in the chain of events leading to an incident or accident;

(b) the importance of cabin crew member actions towards increasing the survivability of aircraft occupants during an evacuation or unlawful interference; and

(c) accidents or incidents relevant to cabin operations, including an evacuation, unlawful interference, in-flight smoke, pressurisation malfunctions, and positive examples of how cabin crew members contribute to preventing accidents or incidents, or increasing survivability once they occur.

7.2 Human factors in aviation

(1) The following topics shall be included:

(a) human factors modelling, such as the SHELL model, which explains the relationship between individuals and their operational environment;

(b) the role of the human in complex systems, such as aviation, and interactions with other humans, hardware, software, and the environment, including the human's contribution to safety and the human operational performance necessary to achieve the established goal;

(c) the concept of human performance as a contributing factor to aircraft accidents; and

(d) case studies of accidents or incidents where human factors were identified as a contributing factor.

7.3 Human error

(1) The following topics shall be included:

(a) general aspects of human physiology and psychology related to aviation;

(b) understanding human performance. This may include aspects of aviation physiology such as limitations of the sense, disorientation, and aviation psychology including workload, information processing, attitudinal factors, judgment and decision-making, stress, operational pressure and corporate pressure;

(c) processes and outcomes such as operational errors, normalised deviations, causes and consequences;

(d) distinction between errors and violations;

(e) the concept of an organisational accident, which includes the interaction between organisational processes, workplace conditions, latent conditions, active failures and defences, and how these can result in an accident. This may include understanding errors and their root cause in an operational context. Accident causation such as Reason's "Swiss Cheese" model which may include the error chain, namely the notion of accident causation, including error, deviation and amplification, and how humans contribute to accidents and incidents;

(f) organisational factors and their impact on safety and on-time performance; and

(g) defence strategies to prevent or control operational errors, including error prevention, detection and recovery of management techniques. This may include strategies, such as error reduction, error capturing and error tolerance.

7.4 Cabin crew competencies

(1) The following competencies shall be demonstrated throughout the initial cabin crew member licensing training programme:

(a) application of policies and procedures;

(b) communication;

(c) leadership and teamwork;

(d) passenger management;

(e) problem solving and decision-making;

(f) situational awareness and management of information; and

(g) workload management.

(2) These cabin crew competencies shall be observed and rated throughout a cabin crew member initial licensing training programme as their development is crucial to the ability to function as a competent cabin crew member.

7.5 Crew resource management training (CRM) for cabin crew members

(1) The goal and objective of CRM training is to improve flight safety through the understanding of the human factor in aviation accidents or incidents.

(2) CRM training is primarily concerned with the effective use of all available resources for flight crew to assure a safe and efficient operation, reducing error, avoiding stress and increasing efficiency.

(3) Training shall include, but is not limited to, the following topics:

(a) CRM concepts, general principles and processes during operations;

(b) use of CRM as a tool to prevent accidents or incidents through improved crew co-ordination, enhanced crew performance and safety awareness;

(c) CRM specific to different aircraft types such as single or multi-deck aircraft, narrow or wide body aircraft, single or multi crew operations;

(d) the need for individual commitment to CRM principles;

(e) benefits of joint CRM training, if applicable;

(f) interaction between crew members and other individuals involved with operation of the aircraft;

(g) competencies that foster CRM, including the components of the relevant competencies;

(h) understanding one's own role and impact on the operation;

(i) the concept of synergy;

(j) cultural differences, diversity awareness and their impact on individual and team performance;

(k) the statutory responsibility and accountability of the PIC as the commander;

(l) the role of the in-charge cabin crew member as the team leader;

(m) "team required" versus "individual" tasks -the notion that some problems require a team solution while others may be solved through individual effort;

(n) awareness of behaviours that affect crew effectiveness;

(o) competencies needed for effective team leaders and team members;

(p) decision-making processes;

(q) resources available - identification and use;

(r) resources for continued self-improvement, as applicable; and

(s) describe and practice how to write an accident or incident report.

7.6 Threat and error management

(1) The following topics shall be included:

(a) the Threat and Error Management (TEM) model, and its components, relevant o cabin operators;

(b) examples of different threats, errors and undesired states, relevant to cabin operators that impact on safety; and

(c) threat, error and undesired state management techniques such as detecting threats, trapping errors, relevant to cabin operations.

(2) The examples used for threats, errors and undesired states should be specific to cabin operations, and differ from those used during flight crew training or training for other operational personnel.

7.7 Fatigue management training

(1) A student shall understand the causes and consequences of fatigue and how to manage them.

(2) A cabin crew member shall understand his or her individual responsibility, and that of the State and an air service operator in managing fatigue.

(3) The following topics shall be included:

(a) definition of fatigue;

(b) definition of fatigue risk management;

(c) consequences of fatigue on cabin crew performance, such as:

(i) physical effects;

(ii) cognitive effects;

(iii) emotional effects; and

(iv) operational implications

(v) the scientific principles on which fatigue management is based, such as:

(aa) sleep as a psychological need; and

(bb) the different types and stages of sleep

(v) factors that affect the sleep of an individual on a particular occasion;

(vi) the body clock, circadian rhythms and circadian influences on sleep;

(vii) physical vs cognitive demands of tasks being performed;

(viii) environmental factors that influence fatigue;

(ix) the regulatory requirements for fatigue management as contained in the regulations and technical standards for ensuring that an operator is managing fatigue-related risks to achieve an acceptable level of safety performance;

(x) operator responsibility for:

(aa) providing fatigue management training;

(bb) implementing work schedules that enable individual cabin crew members to perform their duties safely;

(cc) identifying and following limitations and scheduling rules that allow opportunities for adequate rest and restorative sleep; and

(dd) having processes for monitoring and managing fatigue hazards, including managing operational risks within the constraints of the prescriptive regulations as part of their SMS.

(xi) individual cabin crew member responsibilities related to:

(aa) arriving fit for duty;

(bb) pursuing personal and operational mitigation strategies appropriately while on duty; and

(cc) identifying and reporting fatigue hazards, including "non-fitness to fly".

(xii) personal fatigue management strategies, at home and in-flight; and

(xiii) workload management.

7.8 Human performance training in relation to SMS

(1) The following topics shall be included:

(i) the importance of cabin crew reporting as part of an operator's SMS; and

(ii) how cabin crew reporting of safety information, including the proactive identification of hazards, contributes to the overall achievement of the SMS objectives.

8. Human trafficking awareness training for initial cabin crew member licence

(1) Trafficking in persons refers to the process through which individuals are placed or maintained in an exploitative situation for economic gain.

(2) As aviation is one of the modes of transportation utilised by traffickers, it is likely that crew members would encounter a situation of trafficking on the ground or in flight.

8.1 Training objective

(1) The objective of this training is to enable crew members to recognise the indicators of suspected trafficking and how to report cases.

8.2 Contents of training syllabus

(1) Training shall include but is not limited to the following topics:

(a) general information on trafficking in persons;

(b) elements of trafficking;

(c) why trafficking happens;

(d) types of trafficking;

(e) general indications of trafficking;

(f) trafficking indicators for cabin crew members;

(g) concept of "Do no harm"; and

(h) the Palermo Protocol.";

(i) the substitution of Technical Standard 64.02.3 for the following Technical Standard:

"64.02.3 THEORETICAL KNOWLEDGE EXAMINATION

1. Examination
2. Retesting after failure
3. **[Maintenance of currency of student cabin crew member licence]** Revalidation of competency of skills for unemployed cabin crew licence holders.

64.02.3 THEORETICAL KNOWLEDGE EXAMINATION

1. Examination

1.1 An applicant for a **[student]** cabin crew member licence shall pass a theoretical knowledge examination with the Authority on subjects and topics specified in **[Section 1 of]** the initial cabin crew member licensing programme, including –

(a) aviation indoctrination training;

(b) normal operations training;

(c) abnormal and emergency situations training;

(d) security awareness training;

(e) dangerous goods awareness training;

(f) cabin health and first aid training;

(g) **[CRM training]** human performance training; and

(h) **[identifying and responding to trafficking in persons]** human trafficking awareness training.

1.2 The examinations shall be provided in the English language only, using abbreviations common to aviation, where applicable.

1.3 The examination shall first be attempted within 30 days of completing the theoretical training specified in technical standard 64.02.2.

1.4 A booking for an examination shall **[not]** only be confirmed **[unless all of the requirements have been met.]** on receipt of proof of having completed all components of the training programme, at least 48 hours prior to the date of the examination.

1.5 In a case where a candidate has not received confirmation of a booking, it is his or her responsibility to confirm that the booking has been successful.

1.6 A candidate shall be present at the examination centre, at least 45 minutes before the scheduled time of commencement of the examination, with the following documents –

(a) an acceptable form of identification such as South African identity document or passport;

(b) confirmation of booking; and

(c) proof of payment.

1.7 A candidate who fails to provide the documents referred to in section **[1.7]** 1.6 or to be present at the required time shall not be permitted to attempt the examination and shall forfeit the fee paid for that subject.

1.8 In addition to the offences listed in Part 185 of the Regulations, the following examination-related actions or conduct are specifically defined as offences –

(a) any dishonest or fraudulent behaviour, including cheating;

(b) using any electronic recording instrument, camera, communication device or any electronic device with a playback function during an examination. This includes, but is not limited to, a mobile phone, smart phone, iPad, iPod, Mp3 player, pager and electronic game device;

(c) for a candidate to have any object referred to in sub-paragraph (b) in his or her possession during an examination, irrespective of whether the device is switched on or not;

(d) wearing any headgear or earphones during an examination without the written approval of the Director, with the exception of a hearing aid worn for medical purposes;

(e) passing any object to another candidate;

(f) communicating in any manner with another candidate;

(g) behaving in an inappropriate manner;

(h) tampering with or damaging the Authority's examination equipment;

(i) any unauthorised accessing, copying or storing of examination data from the official Authority's examination database;

(j) disobeying any lawful instruction of the examination invigilator or an enforcement officer; or

(k) looking at the work of another candidate.

1.9 The Director shall not enter into discussion or correspondence with a candidate on the subject of their examination results but a candidate may apply for a paper to be re-marked with specific reference to subsection (2) of this Technical Standard.

2. Retesting after failure

2.1 The pass mark for any written examination referred to in CAR 64.02.3 is 75%.

2.2 A candidate who fails with a mark of between 71% and 74%, may apply in writing for a re-mark within 30 days from the date of receiving the examination results, on payment of the appropriate fee. If the re-mark is successful, the fee shall be refunded.

2.3 A candidate may not apply to rewrite an examination until he or she has received the official result notification.

2.4 A candidate may not rewrite any examination subject in respect of which a re-mark has been requested and for which he or she has not been notified of the official result. Failure to comply with this condition shall result in the premature re-write being invalidated and the applicable examination fee forfeited.

2.5 A candidate who has failed an examination conducted by the Authority may not, in the case of a first or second failure, rewrite the applicable examination subject within a period of 7 calendar days after the date of failure.

2.6 A candidate who has failed an examination conducted by the Authority may not, in the case of a third or subsequent failure, rewrite the applicable examination subject within a period of 60 calendar days after the date of failure.

2.7 A candidate who has failed an examination conducted by the Authority, with a score of less than 50%, whether first or subsequent attempt, may not rewrite the applicable examination subject within a period of 60 calendar days after the date of failure.

2.8 In exceptional circumstances and at the discretion of the Director, the period of 7 calendar days referred to in subsection 2.5 may be shortened, after written application by a candidate and with the written approval of the Director.

3. Revalidation of competency of skills for unemployed cabin crew licence holders

3.1 A holder of a cabin crew member licence that has not been employed by a South African air service operator shall undergo a revalidation of competency check within 12 months from the date of initial issue and thereafter within a period of 12 months calculated from –

(a) the date of issue; or

(b) the beginning of the month following the date of:

(i) the expiry of the competency, if such competency is revalidated within 90 days immediately prior to expiry; or

(ii) revalidation of such competency, if revalidated prior to the period referred to in subparagraph (i).

3.2 A holder of a cabin crew member licence, that has not been employed by a South African air service operator, shall submit the following documentation to the Authority to ensure revalidation of competency:

(a) duly completed application form;

(b) revalidation of competency skills test report form conducted by a cabin designated examiner; and

(c) proof of payment of appropriate fee as per Part 187.

3.3 A holder of a cabin crew member licence who has not maintained competency by passing a revalidation of competency skills test within the 12 months, issue or revalidation of competency of such licence shall comply with the following requirements:

(a) in the case of a holder of a cabin crew member licence where the competency has lapsed by more than 12 months but not more than 36 months, a licence holder shall:

(i) undergo sufficient training at an approved ATO to reach the standard required for the revalidation of competency skills test; and

(ii) pass a revalidation of competency skills test, conducted by a cabin designated examiner.

(b) in the case of a holder of a cabin crew member licence where the competency has lapsed by more than 36 months, a licence holder shall –

(i) undergo initial training for a cabin crew member licence at an approved ATO; and

(ii) pass an initial skills test, conducted by a cabin designated examiner.";

(j) the substitution of Technical Standard 64.02.4 for the following Technical Standard:

"**64.02.4 SKILL TEST**

1. Procedures

2. Skills test for **[Section 1]** initial cabin crew member licence

3. Skills test for **[Section 2]** revalidation of competency of cabin crew member licence.

64.02.4 SKILL TEST

1. Procedures

The procedures referred to in regulation 64.02.4 are the drills and checks contained in this Technical Standard.

1.1 The aim of a skills test is to:

(a) assess skills, knowledge and attitude relevant to a licence or rating;

(b) determine whether the candidate can:

(i) apply his or her knowledge to real life events;

(ii) make the appropriate decisions; and

(iii) apply acceptable risk management;

(c) promote learning

1.2 The drills for the skills test for the initial issue of a cabin crew member licence shall be performed on successful completion of the examination with the Authority.

1.3 The drills for the skills test for revalidation of competency of a cabin crew member licence shall be performed on successful completion of the examination with an ATO.

1.4 Drills are assessed as being either “Competent” or “Not yet competent”.

1.5 A drill is assessed as “Competent” when the candidate meets all of the evaluation criteria comfortably and confidently.

1.6 A skills test is divided into various drills and assessment of each drill shall be completed before feedback is given to the candidate on the outcome of that drill.

1.7 A drill is performed once, assessed once and scored accordingly.

1.8 A drill may be repeated only in the following circumstances:

(a) legitimate instances when a candidate is not able understand a cabin designated examiner’s request to perform a specific task. It should be noted that a candidate’s failure to understand the nature of a specified task being requested does not justify repeating a skills test item or drill;

(b) in the event of a finding of “Not yet competent” after the first attempt; and

(c) if the skills test or drill is not completed due to circumstances beyond a candidate or cabin designated examiner's control, the subsequent skills test shall be completed within 30 days of the original event.

1.9 A drill is assessed as "Not yet competent" under the following circumstances:

(a) the aim of the task or duty is not achieved;

(b) the candidate is unable to meet the evaluation criteria or the candidate meets the criteria through coaching and leading;

(c) the performance of an item includes errors or deviations that are repeated or that are not recognised or corrected in a timely manner;

(d) a candidate does not demonstrate the level of technical proficiency or knowledge necessary;

(e) a candidate has lapses in situational awareness that are not identified or corrected;

(f) a candidate's management skills are ineffective;

(g) the safety of a flight could be compromised by the action or inaction of the candidate;

(h) a candidate performs the drill in an illogical sequence or in a manner that would have catastrophic consequences in real life.

1.10 A Cabin Designated Examiner shall evaluate all items of a particular drill prior to announcing a failure and stopping the assessment.

1.11 A candidate shall be required to competently perform all drills to complete a skills test.

1.12 A skills test is failed when a candidate –

(a) is unsuccessful in 3 or more drills;

(b) consistently demonstrates lack of knowledge or understanding in one area, irrespective of the drill being performed; or

(c) consistently demonstrates lack of the level of technical proficiency necessary to carry out the functions of the licence or rating.

1.13 In the case of an unsuccessful skills test, the candidate shall undergo remedial training with a cabin crew instructor, other than a person who conducted such skills test, before resubmitting himself or herself for a re-test provided that no re-test may be conducted within 72 hours of an unsuccessful skills test.

1.14 The drills that form part of the skills test for the initial issue of a cabin crew member licence are:

(a) public address announcements;

(b) passenger briefings;

(c) safety equipment pre-flight checks;

(d) safety equipment use;

(e) pre-take off checks;

(f) pre-landing checks;

(g) unanticipated or unprepared emergency landing or ditching;

(h) anticipated or prepared emergency landing or ditching;

(i) simulated fire fighting;

(j) live fire fighting;

(i) wet ditching;

(j) pilot incapacitation; [and]

(k) cabin crew member incapacitation; and

(g) post landing duties.

1.15 The drills that form part of the skills test for revalidation of competency of a cabin crew member licence are:

(a) public address announcements;

(b) safety demonstration;

(c) interphone use;

(d) passenger briefings;

(e) safety equipment pre-flight checks;

(f) safety equipment use;

(g) pre-take off checks

(h) pre-landing checks

(i) post landing duties

(j) anticipated or prepared emergency landing or ditching

(k) unanticipated or unprepared emergency landing or ditching;

(l) simulated fire fighting;

(m) live fire fighting every 3 years;

(n) wet ditching every 3 years;

(o) pilot incapacitation; and

(p) cabin crew member incapacitation.

2. Skills test for **[Section 1]** initial issue of a cabin crew member licence

2.1 Public address announcements evaluation criteria

(a) **[Each]** A candidate shall demonstrate effective communication techniques on a public address system and deliver at least one published announcement.

(b) **[The]** A cabin designated examiner shall issue a candidate with a list of announcements that may be assessed.

(c) **[The]** A device used for the assessment shall be similar to or the same as the one used for practical training.

(d) **[The]** A cabin designated examiner shall select an announcement and advise a candidate of such.

(e) Where there is more than one candidate, different announcements shall be used as part of the assessment variable.

(f) **[The]** A cabin designated examiner shall evaluate **[the**] a candidate based on the following:

(i) selection of the correct announcement;

(ii) appropriate use of terminology;

(iii) correct pronunciation of words;

(iv) appropriate use of volume;

(v) appropriate use of pace;

(vi) appropriate use of tone;

(vii) appropriate use of inflection;

(viii) appropriate use of resonance; and

(ix) clarity of message.

2.2 Safety demonstration evaluation criteria

(a) A candidate shall perform a full passenger pre-flight safety demonstration.

(b) A cabin designated examiner shall evaluate the candidate on:

(i) proper use of eye contact and body language;

(ii) correct use and simulation of the operation of each piece of demonstration equipment; and

(iii) display of confidence and leadership.

2.3 Passenger briefings evaluation criteria

(a) **[The]** A candidate shall deliver briefings to different types of passengers on board an aircraft.

(b) **[The]** A cabin designated examiner shall issue a candidate with a list of [special attention] special categories of passengers that may be briefed for the purpose of assessment.

(c) **[The]** A cabin designated examiner shall select a **[special attention]** special category passenger type and advise a candidate of such.

(d) Where there is more than one candidate, different **[special attention passenger types]** special categories of passenger examples shall be used as part of the assessment variable.

(e) **[The]** A cabin designated examiner shall evaluate the candidate based on the following for the briefing of a **[special attention]** special category of passenger –

(i) identify the correct briefing to be completed;

(ii) completeness of briefing content such as all relevant points included;

(iii) effective use of communication techniques such as clarity, comprehension and absence of jargon;

(iv) correctly modified in accordance with requirements of the individual to whom the briefing is delivered;

(v) proper use of eye contact and body language;

(vi) correct use and simulation of the operation of each piece of demonstration equipment;

(vii) display confidence and ability to answer questions; and

(viii) the cabin designated examiner verifies that briefing points were understood.

(f) **[The]** A cabin designated examiner shall evaluate **[the]** a candidate based on the following for the briefing of a passenger seated at **[an unstaffed]** a non-crewed exit row –

(i) identify the correct briefing to be completed;

(ii) completeness of briefing content such that all relevant points are included;

(iii) effective use of communication techniques such as clarity, comprehension and absence of jargon;

(iv) **[correctly modified in accordance with requirements of the individual to whom the briefing is delivered]** ability of **[the]** an individual to understand English is confirmed;

(v) proper use of eye contact and body language;

(vi) correct use and simulation of the operation of [each piece of demonstration equipment] the emergency ;

(vii) display confidence and ability to answer questions; and

(viii) **[the]** a cabin designated examiner verifies that briefing points were understood.

[2.3] 2.4 Safety equipment pre-flight checks evaluation criteria

(a) **[Each]** A candidate shall perform the applicable safety equipment checks to ensure that all equipment is available and serviceable.

(b) **[Each]** A candidate shall demonstrate the pre-flight checks of each of the following items of equipment –

(i) portable oxygen;

(ii) first aid kit;

(iii) flashlight;

(iv) crew life jacket;

(v) extra life jackets – adult;

(vi) extra life jackets – infant;

(vii) fire extinguisher – [with hose fitted and without hose fitted] all types fitted on aircraft;

(viii) PBEs – **[a minimum of two (2) different types commonly used on board aircraft]** all types fitted on aircraft;

(ix) fire gloves;

(ix) fire axe; and

(x) megaphone.

(c) **[The]** A cabin designated examiner shall issue a candidate with a list of safety equipment to be assessed.

(d) **[The]** A cabin designated examiner shall select the order in which the safety equipment is to be assessed and shall advise a candidate of such.

(e) Each item of equipment shall be assessed separately and each item of equipment shall be considered a single drill.

(f) **[The]** A cabin designated examiner shall evaluate the candidate on the following for each item of equipment –

(i) identify the correct item of equipment; and

(ii) correctly complete the pre-flight checks for each item of equipment.

[2.4] 2.5 **Safety equipment use evaluation criteria**

(a) **[Each]** A candidate shall demonstrate the correct use of identified safety equipment.

(b) **[Each]** A candidate shall physically demonstrate the use of each of the following items of equipment –

(i) portable oxygen;

(ii) flashlight;

(iii) crew life jacket;

(iv) fitting an adult life jacket to a child;

(v) fitting of an infant life jacket;

(vi) fire extinguisher – at least one (1) type with hose fitted and one (1) type with no hose fitted, excluding the water extinguisher;

(vii) PBEs – a minimum of two (2) different types commonly used on board an aircraft; and

(ix) megaphone

(c) **[The]** A cabin designated examiner shall issue a candidate with a list of safety equipment to be assessed.

(d) All safety equipment shall be representative of the type typically used on aircraft.

(e) **[The]** A cabin designated examiner shall select the order in which the use of the safety equipment is to be assessed and shall advise a candidate of such.

(f) Each item of equipment shall be assessed separately and each item of equipment shall be considered a single drill.

(g) **[The]** A cabin designated examiner shall evaluate [the] a candidate on the following for the use of the portable oxygen and a candidate shall –

(i) **[Each candidate shall]** retrieve an oxygen mask and hose and attach it to the high flow outlet;

(ii) **[Each candidate shall]** approach a passenger while carrying the portable oxygen bottle, using the carry strap;

(iii) **[Each candidate shall]** prepare the passenger for receiving oxygen;

(iv) **[Each candidate shall]** turn on the oxygen and simulate or test for flow then position and secure the mask to the passenger's face;

(v) **[Each candidate shall]** secure the oxygen bottle and position it to monitor the supply; and

(vi) **[Each candidate shall]** recognise when oxygen is no longer required and apply procedures for shutting off the supply and restowing the oxygen mask and bottle.

(h) **[The]** A cabin designated examiner shall evaluate **[the]** a candidate on the following for the use of the flashlight and a candidate shall–

(i) **[Each candidate shall]** demonstrate the use of a flashlight in dark conditions;

(ii) **[Each candidate shall]** demonstrate the use of a flashlight in smoke-filled conditions.

(i) **[The]** A cabin designated examiner shall evaluate **[the]** a candidate on the following for the use of the crew life jacket and a candidate shall–

(i) **[Each candidate shall]** don a life jacket, representative of the type, typically used on an aircraft;

(ii) **[Each candidate shall]** inflate the life jacket using the oral mouth piece;

(iii) **[Each candidate shall]** deflate the life jacket;

(iv) **[candidate shall Each]** locate and review the light activation; and

(v) **[Each candidate shall]** locate the whistle.

(j) **[The]** A cabin designated examiner shall evaluate the candidate on the following for the fitting of an adult life jacket to a child –

(i) The adult life jacket used shall be representative of the type typically found on board an aircraft.

(ii) **[Each]** A candidate shall demonstrate how to fit an adult life jacket on a child by fitting the life jacket to a mannequin of representative size.

(k) **[The]** A cabin designated examiner shall evaluate the candidate on the following for the fitting of an infant life jacket –

(i) The infant life jacket used shall be representative of the type typically found on board an aircraft.

(ii) **[Each]** A candidate shall demonstrate how to fit an infant life jacket to a mannequin of a representative size.

(iii) **[Each]** A candidate shall locate the tape for the adult to hold onto.

(l) **[The]** A cabin designated examiner shall evaluate the candidate on the following for the use of the halon fire extinguisher –

(i) The fire extinguisher used shall be representative of the type typically found on board an aircraft.

(ii) **[Each]** A candidate shall simulate the breaking of the seal used on the fire extinguisher;

(iii) **[Each]** A candidate shall simulate the procedure used to release the extinguisher, that is squeezing the handle to start deployment of the extinguishing agent;

(iv) **[Each]** A candidate shall demonstrate the correct manner to hold the extinguisher while fighting a fire;

(v) **[Each]** A candidate shall demonstrate the procedure for spraying the extinguisher at the base of the simulated fire;

(vi) **[Each]** A candidate shall identify the types of fire best suited for using a halon extinguisher; and

(vii) **[Each]** A candidate shall describe the precautions to be considered when using a halon fire extinguisher.

(m) **[The]** A cabin designated examiner shall evaluate [the] a candidate on the following for the use of a water fire extinguisher –

(i) The fire extinguisher used shall be representative of the type typically found on board an aircraft.

(ii) **[Each]** A candidate shall simulate the puncturing of the cartridge used in the fire extinguisher;

(iii) **[Each]** A candidate shall demonstrate the correct manner to hold the extinguisher while fighting a fire;

(iv) **[Each]** A candidate shall demonstrate the procedure for spraying the extinguisher at the base of the simulated fire; and

(v) **[Each]** A candidate shall identify the types of fire best suited for using a water extinguisher.

(n) **[The]** A cabin designated examiner shall evaluate [the] a candidate on the following for the use of the PBE –

(i) The PBE or smokehoods used shall be representative of the type typically found on board an aircraft.

(ii) **[Each]** A candidate shall demonstrate the use of at least two (2) different types of PBEs found on board an aircraft.

(iii) **[Each]** A candidate shall remove the PBE from its casing;

(iv) **[Each]** A candidate shall identify all features of the PBE;

(v) **[Each]** A candidate shall don the PBE and secure it correctly to the body;

(vi) **[Each]** A candidate shall ensure that any long hair is tucked into the PBE;

(vii) **[Each]** A candidate shall demonstrate the ability to communicate while wearing the PBE;

(viii) **[Each]** A candidate shall demonstrate the brace position to be considered when wearing the PBE;

(ix) **[Each]** A candidate shall demonstrate the removal of the PBE from the body; and

(x) **[Each]** A candidate shall describe the safety considerations after removing the PBE.

(o) **[The]** A cabin designated examiner shall evaluate [the] a candidate on the [following] for the use of the megaphone and a candidate shall demonstrate –

(i) **[Each candidate shall demonstrate]** the means to activate and speak into the microphone housing of the megaphone; and

(ii) **[Each candidate shall demonstrate]** the method of volume control on the megaphone.

[2.5] 2.6 Pre-take off checks evaluation criteria

(a) **[Each]** A candidate shall verbally describe **[demonstrate]** the pre-take off checks to be conducted when on board an aircraft.

(b) The device used for assessment shall be similar to or the same as the one used for practical training.

(c) **[Each]** A candidate shall be able to verbally describe **[demonstrate]** checks of the following:

(i) seat belts fastened;

(ii) seat backs in upright position;

(iii) tray tables stowed;

(iv) arm rests down;

(v) cabin baggage correctly stowed;

(vi) overhead bins closed;

(vii) exit rows free of obstruction;

(viii) parents with infants seated correctly;

(ix) electronic devices in the correct mode;

(x) foot rests stowed;

(xi) **[special attention]** special categories of passengers briefed;

(xii) **[unmanned]** non-crewed exit rows briefed;

(xiii) cabin doors correctly closed and armed;

(xiv) cabin lighting set;

(xv) galley equipment secured;

(xvi) music system switched off;

(xvii) toilets clear and locked;

(xviii) window blinds open;

(xix) passenger head count completed; and

(xx) flight crew advised that the cabin is sterile.

[2.6] 2.7 Pre-landing checks evaluation criteria

(a) **[Each]** A candidate shall verbally describe **[demonstrate]** the pre-landing checks to be conducted when on board an aircraft.

(b) The device used for assessment shall be similar to or the same as the one used for practical training.

(c) **[Each]** A candidate shall verbally describe **[ensure]** the following –

(i) seat belts fastened;

(ii) seat backs in upright position;

(iii) tray tables stowed;

(iv) arm rests down;

(v) cabin baggage correctly stowed;

(vi) overhead bins closed;

(vii) exit rows free of obstruction;

(viii) parents with infants seated correctly;

(ix) electronic devices in the correct mode;

(x) foot rests stowed;

(xi) [unmanned] non-crewed exit rows briefed;

(xii) cabin doors correctly closed and armed;

(xiii) cabin lighting set;

(xiv) galley equipment secured;

(xv) music system switched off;

(xvi) toilets clear and locked;

(xvii) window blinds open; and

(xviii) flight deck crew advised that the cabin is sterile.

[2.7] 2.8 Post landing checks evaluation criteria

(a) A candidate shall verbally describe **[demonstrate]** the post landing cabin checks to be conducted after landing of the aircraft.

(b) The device used for assessment shall be similar to or the same as the one used for practical training by an ATO.

(c) A cabin designated examiner shall evaluate each candidate on verbally describing the following:

(i) delivering the post landing announcement

(ii) ensuring passengers remain seated;

(iii) activating cabin lights prior to disembarking passengers;

(iv) following procedures for doors to be opened; and

(v) ensuring that procedures are in place for passengers to be disembarked.

2.9 Anticipated or Prepared emergency landing and ditching evaluation criteria

(a) A candidate shall perform at least one anticipated or prepared land and one anticipated or prepared water ditching simulated emergency.

(b) To ensure understanding of operational differences, the assessment shall be performed with candidates in a multi-crew environment and also single cabin crew member environment.

(c) Where the multi-crew drill is performed, the number of candidates that could participate at any time shall be appropriate to the cabin simulator configuration.

(d) A candidate shall assume an actual crew position and shall perform the designated evacuation responsibilities for that position;

(e) Where a double cabin crew member seat is available and would normally be occupied by two crew members the assessment shall be conducted to reflect this reality.

(f) The assessment variables shall include –

(i) unserviceable exits;

(ii) inflation devices that fail or only partially inflate;

(iii) aircraft attitude which necessitates a decision to use the exit or redirect passengers;

(iv) poor visibility caused by darkness or smoke;

(v) incapacitated flight crew members;

(vi) exits which become unusable during the evacuation;

(vii) passengers in panic;

(viii) failure of aircraft emergency systems such as lighting, evacuation and communication signal;

(ix) decompression; and

(x) situation requiring altering of commands.

(g) A cabin designated examiner shall evaluate each candidate on the following –

(i) recognising the in-flight emergency signal from the flight deck and reacting according to procedures;

(ii) preparing passengers, cabin and self according to procedures and scenario;

(iii) selecting and briefing ABP to assist as required, including opening unstaffed exits, removing and launching life rafts, crowd control, assisting passengers with special needs, assisting outside the aircraft and directing people away from the aircraft or onto rafts;

(iv) applying all applicable commands, using the appropriate terminologies with clear, positive, authoritative communication techniques, appropriate for the assessment scenario;

(v) responding appropriately to the “Brace” command or signal;

(vi) recognising when and how to respond to the “Evacuate” command or signal;

(vii) activating the cabin emergency lights, where applicable;

(viii) assessing conditions inside and outside the exit to determine exit usability, throughout the evacuation;

(ix) commanding passengers to prepare for evacuation;

(x) preparing and opening the exit;

(xi) securing the exit in the fully open position;

(xii) assuming the appropriate protective position;

(xiii) initiating a passenger evacuation;

(xiv) controlling passenger flow throughout the evacuation;

(xv) performing final cabin and flight deck checks;

(xvi) removing the necessary safety equipment;

(xvii) exiting the aircraft or simulator correctly;

(xviii) demonstrating the duties and responsibilities to be completed following the evacuation scenario

(h) A candidate shall correctly apply procedures as related to the scenario; and

(i) A candidate shall identify the consequences of errors in the scenario.

2.10 Unanticipated or Unprepared emergency landing or ditching evaluation criteria

(a) **[Each]** A candidate shall perform at least one unanticipated or unprepared land and one unanticipated or unprepared water ditching simulated emergency;

(b) To ensure understanding of operational differences, the assessment shall be performed with **[cabin crew members]** candidates in a multi-crew environment and also single cabin crew member environment;

(c) Where the multi-crew drill is performed, the number of **[cabin crew members]** candidates that could participate at any time shall be appropriate to the cabin simulator configuration;

(d) **[Each]** A candidate shall assume an actual crew position and shall perform the designated evacuation responsibilities for that position;

(e) Where a double cabin crew member seat is available and would normally be occupied by two crew members the assessment shall be conducted to reflect this reality.

(f) The assessment variables may include but are not limited to –

(i) unserviceable exits;

(ii) inflation devices that fail or only partially inflate;

(iii) aircraft attitude which necessitates a decision to use the exit or redirect passengers;

(iv) poor visibility caused by darkness or smoke;

(v) incapacitated flight crew members;

(vi) exits which become unusable during the evacuation;

(vii) passengers in panic;

(viii) failure of aircraft emergency systems, such as lighting, evacuation and communication signal;

(ix) decompression; and

(x) situation requiring altering of commands

(g) **[The]** A cabin designated examiner shall evaluate each candidate on the following –

(i) securing himself or herself in a cabin crew member seat using the correct mechanism and restraint system;

(ii) recognising that an emergency situation is developing and responding appropriately to the scenario;

(iii) applying all applicable commands, using the appropriate terminologies with clear, positive, authoritative communication techniques, appropriate for the assessment scenario;

(iv) responding appropriately to the “Brace” command or signal;

(v) recognising when and how to respond to the “Evacuate” command or signal;

(vi) activating the cabin emergency lights, where applicable;

(vii) assessing conditions inside and outside the exit to determine exit usability, throughout the evacuation;

(viii) locating and donning the life jacket during the anticipated or prepared ditching assessment;

(ix) commanding passengers to prepare for evacuation;

(x) preparing and opening the exit;

(xi) securing the exit in the fully open position;

(xii) assuming the appropriate protective position;

(xiii) initiating a passenger evacuation;

(xiv) controlling passenger flow throughout the evacuation;

(xv) performing final cabin and flight deck checks;

(xvi) removing the necessary safety equipment; and

(xvii) exiting the aircraft or simulator correctly.

(h) **[Each]** A candidate shall correctly apply procedures as related to the scenario; and

(i) **[Each]** A candidate shall identify the consequences of errors in the scenario.

[2.8] 2.11 Simulated fire fighting evaluation criteria

(a) A candidate shall participate in a simulated fire fighting drill using the relevant equipment and simulated fire fighting techniques.

(b) The furnishings used shall be similar to or the same as those found on board aircraft and these are to include seats, galley units, panels, waste bins and overhead bins.

(c) Fire extinguishers used for simulated fire fighting shall be similar to or the same as those found on board aircraft, with respect to weight, dimensions, controls and operations.

(d) Portable breathing equipment used for simulated fire fighting shall be similar to or the same as those found on board aircraft.

(e) A PBE used for training does not have to be operational but shall be representative of an actual smokehood.

(f) Fire gloves used for simulated fire fighting shall be similar to or the same as those found on board aircraft.

(g) Simulated fire fighting assessments, from any of the known fire classes, shall be conducted in each of the following locations :

(i) cabin area – under seat, seat when electrically operated, overhead bin or closet;

(ii) galley area – garbage bin, upper electrical panel or oven;

(iii) confined area – lavatory waste bin;

(iv) hidden area – behind panels.

(h) A cabin designated examiner shall evaluate the candidate on the following:

(i) recognising or identifying the problem;

(ii) correctly locating the source of the simulated fire using the appropriate technique and equipment;

(iii) effective use of communication and coordination procedures throughout the drill by notifying the fellow flight deck crew members of the situation, establishing and maintaining

communication with the flight deck crew, providing clear, concise information to the PIC and relocating passengers;

(iv) responding in a timely manner;

(v) effectively using or simulating the use of the necessary emergency equipment; and

(vi) following appropriate extinguishing and post fire monitoring techniques.

2.12 Live fire fighting evaluation criteria

(a) **[Each]** A candidate shall extinguish live fires using the relevant equipment and fire fighting techniques.

(b) Fire extinguishers used for live fire fighting shall be charged with an environmentally friendly agent.

(c) A PBE used for training does not have to be operational but shall be representative of an actual smokehood.

(d) Live fire fighting assessments, from any of the known fire classes, shall be conducted in each of the following locations:

(i) cabin area –under seat, on seat when electrically operated, overhead bin or closet; and

(ii) galley area – garbage bin, upper electrical panel or oven; and

(iii) confined area – lavatory waste bin; and

(iv) hidden area – behind panels.

(e) **[Each]** A candidate shall recognise or identify the problem;

(f) **[Each]** A candidate shall correctly locate the source of the fire using the appropriate technique and equipment;

(g) **[Each]** A candidate shall use effective communication and coordination procedures throughout the drill, such as notifying fellow cabin crew members of the situation, establishing and maintaining communication

with the flight crew, providing clear, concise information to the PIC and relocating passengers;

(h) **[Each]** A candidate shall respond in a timely manner;

(i) **[Each]** A candidate shall effectively use an actual fire extinguisher, correctly applied to an actual fire, while wearing PBE and gloves ;

(j) **[Each]** A candidate shall correctly use fire fighting equipment consistent with the type of fire, location of the fire and maximum effective position of the fire extinguisher;

(k) **[Each]** A candidate shall follow appropriate extinguishing and post fire monitoring techniques.

[2.9] 2.13 Wet ditching evaluation criteria

(a) **[Each**] A candidate shall protect and sustain his or her safety in water, while assisting passengers to do the same.

(b) Life jackets used for this drill shall be representative of the type typically found on board an aircraft.

(c) Life rafts used for this drill shall be representative of the type typically found on board an aircraft.

(d) **[Each]** A candidate shall correctly identify the inflation lanyard for the life raft.

(e) **[Each]** A candidate shall identify the quick release mechanism while verbally describing the procedure to release the raft from the aircraft.

(f) **[Each]** A candidate shall don a life jacket and secure it to the body correctly.

(g) **[Each]** A candidate shall inflate the life jacket using the manual inflation tube.

(h) **[Each]** A candidate shall enter the water within 5 seconds of being given the command to do so.

(i) **[Each]** A candidate shall assume the individual heat escape lessening posture for a minimum of 10 seconds in water.

(j) **[Each]** A candidate shall assume the group huddle position for a minimum of 15 seconds in water.

(k) **[Each]** A candidate shall move in water for a minimum distance of 15 metres.

(l) **[Each]** A candidate shall cover the required distance in no longer than 2 minutes.

(m) **[Each]** *A* candidate shall board the raft, from water, without any assistance, within **[1 minute]** 10 minutes of being given the command to do so.

(n) **[Each]** A candidate shall deflate the life jacket manually.

[2.10] 2.14 Pilot incapacitation evaluation criteria

(a) **[Each]** A candidate shall apply the procedures relating to an incapacitated pilot.

(b) The assessment shall be performed using either an actual flight crew seat or one that is representative of a flight crew seat with all the required control mechanisms.

(c) A cabin designated examiner shall evaluate each candidate on the following –

(i) moving the pilot away from the flight controls;

(ii) correctly fastening and locking the restraint system;

(iii) positioning the pilot seat correctly, using the controls in a horizontal, vertical and recline position;

(iv) administering first aid, as necessary;

(v) demonstrating the use of the oxygen system on the flight deck; and

(vi) applying crew coordination and communication procedures to assist the remaining flight deck crew member.

[2.15 Cabin crew member incapacitation evaluation criteria

(a) [Each] A candidate shall apply the procedures relating to an incapacitated cabin crew member in the environment that the cabin crew member would operate in when onboard the [operator's] aircraft [such as] in a multi-crew [and single cabin crew] environment, if applicable.

(b) The exercise shall be performed using either an actual cabin crew seat or one that is representative of a cabin crew seat with all the required control mechanisms.

(c) [The] A cabin designated examiner shall evaluate the candidate on the following [–]:

(i) identifying or responding to the problem;

(ii) effective securing of the incapacitated cabin crew member;

(iii) administering first aid, as required;

(iv) informing the flight crew; and

(v) reassigning of cabin crew stations, if applicable.]"

3. Skills test for revalidation of competency of a cabin crew member licence

3.1 Public address announcements evaluation criteria

(a) The PA system used for the assessment shall be similar to or the same as the PA system on board **[the]** aircraft **[in the operator's fleet].**

(b) **[Each]** A candidate shall demonstrate effective communication techniques on the PA system and deliver at least one published announcement.

(c) **[The]** A cabin designated examiner shall issue a candidate with a list of announcements that may be assessed.

(d) **[The]** A cabin designated examiner shall select an announcement and advise a candidate of such.

(e) Where there is more than one candidate, different announcements shall be used as part of the assessment variable.

(f) **[The]** A cabin designated examiner shall evaluate the candidate on –

(i) correct operation of the system;

(ii) selection of the correct announcement;

(iii) message clarity; and

(iv) appropriate use of terminology; **[and**

(v) correctly following the operator's procedures for use of the PA system.]

3.2 Safety demonstration evaluation criteria

(a) **[Each]** A candidate shall perform a full passenger pre-flight safety demonstration.

(b) **[The]** A cabin designated examiner shall evaluate the candidate on –

(i) proper use of eye contact and body language;

(ii) correct use and simulation of the operation of each piece of demonstration equipment; and

(iii) display of confidence and leadership.[; **and**

(iv) following of the operator's procedures correctly for the safety demonstration.]

3.3 Interphone use evaluation criteria

(a) The interphone system used for the assessment shall be similar to or the same as the interphone system on board the aircraft in the operator's fleet.

(b) **[The]** A cabin designated examiner shall evaluate the candidate on –

(i) correct operation of the system; and

(ii) appropriate use of terminology; **[and**

(iii) correctly following the operator's procedures for use of the interphone system.]

3.4 Passenger briefings evaluation criteria

(a) **[Each]** A candidate shall perform a pre-flight briefing for a passenger seated at [an unstaffed] a non-crewed exit row.

(b) **[The]** A cabin designated examiner shall evaluate the candidate based on the following for the briefing of a passenger seated at **[an unstaffed]** a non-crewed exit row –

(i) identify the correct briefing to be completed;

(ii) completeness of briefing content;

(iii) effective use of communication techniques such as clarity, comprehension and absence of jargon;

(iv) briefing correctly modified in accordance with requirements of the individual to whom the briefing is delivered;

(v) proper use of eye contact and body language;

(vi) correct use and simulation of the operation of the emergency exit;

(vii) displays confidence and ability to answer questions; and

(viii) the cabin designated examiner verifies that briefing points were understood.

(c) **[Each]** A candidate shall perform a pre-flight briefing for a special category passenger [with special needs].

(d) **[The]** A cabin designated examiner shall issue a candidate with a list of special categories of passengers **[with special needs]** that may be briefed for the purpose of the assessment.

(e) **[The]** A cabin designated examiner shall select from the list of passengers referred to in paragraph (d) above, a special category passenger **[with special needs]** to be briefed and advise the candidate of such.

(f) Where there is more than one candidate, different special category passengers **[with special needs]** shall be used as part of the assessment variable.

(g) **[The]** A cabin designated examiner shall evaluate the candidate based on the following for the briefing of a special category passenger **[with special needs]** –

(i) identify the correct briefing to be completed;

(ii) completeness of briefing content;

(iii) effective use of communication techniques such as clarity, comprehension and absence of jargon;

(iv) briefing correctly modified in accordance with requirements of the individual to whom the briefing is delivered;

(v) proper use of eye contact and body language;

(vi) correct use and simulation of the operation of demonstration equipment;

(vii) displays confidence and ability to answer questions; and

(viii) the cabin designated examiner verifies that briefing points were understood.

3.5 Safety equipment pre-flight checks evaluation criteria

(a) **[Each]** A candidate shall perform the applicable safety equipment pre-flight checks to ensure that all equipment is available and serviceable.

(b) **[The]** A cabin designated examiner shall issue a candidate with a list of safety equipment to be assessed.

(c) The stowage method used shall be similar to or the same as that on board **[the]** aircraft **[in the operator's fleet**].

(d) The equipment used shall be similar to or the same as that on board **[the]** aircraft [in the operator's fleet].

(e) **[The]** A cabin designated examiner shall select the order in which the safety equipment is to be assessed and shall advise a candidate of such.

(f) Each item of equipment shall be assessed separately and each item of equipment shall be considered a single drill.

(g) **[Each]** A candidate shall demonstrate the ability to remove the following items of equipment from their stowages and return them afterwards –

(i) portable oxygen bottle;

(ii) first aid kit;

(iii) flashlight;

(iv) fire extinguisher – at least one; either with hose fitted or without, excluding the water extinguisher;

(v) PBE; and

(vi) megaphone.

(h) **[Each]** A candidate shall perform the serviceability checks on the following items of equipment:

(i) portable oxygen bottle;

(ii) first aid kit;

(iii) flashlight;

(iv) crew life jacket;

(v) fire extinguisher – at least one; either with hose fitted or without, excluding the water extinguisher;

(vi) PBE;

(vii) fire gloves; and

(viii) megaphone.

(i) **[The]** A cabin designated examiner shall evaluate the candidate on the following for each item of equipment –

(i) identify the correct item of equipment;

(ii) correctly remove the item of equipment from its stowage;

(iii) correctly replace the item of equipment in its stowage; and

(iv) correctly complete the pre-flight checks for each item of equipment.

3.6 Safety equipment use evaluation criteria

(a) **[Each]** A candidate shall demonstrate the correct use of identified safety equipment.

(b) **[Each] A** candidate shall physically demonstrate the use of each of the following items of equipment –

(i) portable oxygen;

(ii) flashlight;

(iii) crew life jacket;

(iv) fitting an adult life jacket to a child;

(v) fitting of an infant life jacket;

(vi) fire extinguisher – at least one (1) type, excluding the water extinguisher;

(vii) PBEs – at least one (1) type commonly used on board an aircraft; and

(ix) megaphone

(c) A cabin designated examiner shall issue a candidate with a list of safety equipment to be assessed.

(d) All safety equipment shall be representative of the type typically used on aircraft.

(e) A cabin designated examiner shall select the order in which the use of the safety equipment is to be assessed and shall advise a candidate of such.

(f) Each item of equipment shall be assessed separately and each item of equipment shall be considered a single drill.

(g) A cabin designated examiner shall evaluate the candidate on the following for the use of the portable oxygen:

(i) A candidate shall retrieve an oxygen mask and hose and attach it to the high flow outlet;

(ii) Each candidate shall approach a passenger while carrying the portable oxygen bottle, using the carry strap;

(iii) A candidate shall prepare the passenger for receiving oxygen;

(iv) A candidate shall turn on the oxygen and simulate or test for flow then position and secure the mask to the passenger’s face;

(v) A candidate shall secure the oxygen bottle and position it to monitor the supply;

(vi) A candidate shall recognise when oxygen is no longer required and apply procedures for shutting off the supply and restowing the oxygen mask and bottle.

(h) A cabin designated examiner shall evaluate the candidate on following for the use of the flashlight:

(i) **[Each]** A candidate shall demonstrate the use of a flashlight in dark conditions;

(ii) **[Each]** A candidate shall demonstrate the use of a flashlight in smoke-filled conditions.

(i) **[The]** A cabin designated examiner shall evaluate the candidate on the following for the use of the crew life jacket and a candidate shall –

(i) don a life jacket, representative of the type, typically used on an aircraft;

(ii) inflate the life jacket using the oral mouth piece;

(iii) deflate the life jacket;

(iv) locate and review the light activation; and

(v) locate the whistle.

(j) A cabin designated examiner shall evaluate the candidate on the following for the fitting of an adult life jacket to a child –

(i) The adult life jacket used shall be representative of the type typically found on board an aircraft.

(ii) A candidate shall demonstrate how to fit an adult life jacket on a child by fitting the life jacket to a mannequin of representative size.

(k) A cabin designated examiner shall evaluate a candidate on the following for the fitting of an infant life jacket –

(i) The infant life jacket used shall be representative of the type typically found on board an aircraft.

(ii) A candidate shall demonstrate how to fit an infant life jacket to a mannequin of a representative size.

(iii) A candidate shall locate the tape for the adult to hold onto.

(l) A cabin designated examiner shall evaluate a candidate on the following for the use of the halon fire extinguisher:

(i) The fire extinguisher used shall be representative of the type typically found on board an aircraft.

(ii) A candidate shall simulate the breaking of the seal used on the fire extinguisher;

(iii) A candidate shall simulate the procedure used to release the extinguisher, that is squeezing the handle to start deployment of the extinguishing agent;

(iv) A candidate shall demonstrate the correct manner to hold the extinguisher while fighting a fire;

(v) A candidate shall demonstrate the procedure for spraying the at the base of the simulated fire;

(vi) A candidate shall identify the types of fire best suited for using a halon extinguisher; and

(vii) A candidate shall describe the precautions to be considered when using a halon fire extinguisher.

(m) A cabin designated examiner shall evaluate the candidate on the following for the use of a water fire extinguisher, if applicable:

(i) The fire extinguisher used shall be representative of the type found on board an aircraft;

(ii) A candidate shall simulate the puncturing of the cartridge used in the fire extinguisher;

(iii) A candidate shall demonstrate the correct manner to hold the extinguisher while fighting a fire;

(iv) A candidate shall demonstrate the procedure for spraying the extinguisher at the base of the simulated fire; and

(v) A candidate shall identify the types of fire best suited for using a water extinguisher.

(n) A cabin designated examiner shall evaluate the candidate on the following for the use of the PBE –

(i) The PBE or smokehoods used shall be representative of the type typically found on board an aircraft.

(ii) A candidate shall demonstrate the use of at least one (1) type of PBE found on board an aircraft.

(v) A candidate shall remove the PBE from its casing;

(iv) A candidate shall identify all features of the PBE;

(v) A candidate shall don the PBE and secure it correctly to the body;

(vi) A candidate shall ensure that any long hair is tucked into the PBE;

(vii) A candidate shall demonstrate the ability to communicate while wearing the PBE;

(viii) A candidate shall demonstrate the brace position to be considered when wearing the PBE;

(ix) A candidate shall demonstrate the removal of the PBE from the body; and

(x) A candidate shall describe the safety considerations after removing the PBE.

(o) A cabin designated examiner shall evaluate the candidate on the following for the use of the megaphone:

(i) A candidate shall demonstrate the means to activate and into the microphone housing of the megaphone; and

(ii) A candidate shall demonstrate the method of volume control on the Pre-take off checks evaluation criteria.

(p) A candidate shall verbally describe the pre-take off checks to be conducted when on board an aircraft.

(q) A candidate shall be able to verbally describe the following:

(i) seat belts fastened;

(ii) seat backs in upright position;

(iii) tray tables stowed;

(iv) arm rests down;

(v) cabin baggage correctly stowed;

(vi) overhead bins closed;

(vii) exit rows free of obstruction;

(viii) parents with infants seated correctly;

(ix) electronic devices in the correct mode;

(x) foot rests stowed;

(xi) special categories of passengers briefed;

(xii) non-crewed exit rows briefed;

(xiii) cabin doors correctly closed and armed;

(xiv) cabin lighting set;

(xv) galley equipment secured;

(xvi) music system switched off;

(xvii) toilets clear and locked;

(xviii) window blinds open;

(xix) passenger head count completed; and

(xx) flight crew advised that the cabin is sterile.

3.7 Pre-landing checks evaluation criteria

(a) A candidate shall verbally describe the pre-landing checks to be conducted when on board an aircraft.

(b) A candidate shall verbally describe the following –

(i) seat belts fastened;

(ii) seat backs in upright position;

(iii) tray tables stowed;

(iv) arm rests down;

(v) cabin baggage correctly stowed;

(vi) overhead bins closed;

(vii) exit rows free of obstruction;

(viii) parents with infants seated correctly;

(ix) electronic devices in the correct mode;

(x) foot rests stowed;

(xi) non-crewed exit rows briefed;

(xii) cabin doors correctly closed and armed;

(xiii) cabin lighting set;

(xiv) galley equipment secured;

(xv) music system switched off;

(xvi) toilets clear and locked;

(xvii) window blinds open; and

(xviii) flight deck crew advised that the cabin is sterile.

3.8 Post landing check evaluation criteria

(a) **[Each]** A candidate shall **[demonstrate]** verbally describe the post landing cabin checks to be conducted after landing of the aircraft.

[(b) The device used for assessment shall be similar to or the same as the one used for practical training by the operator]

[(c) The cabin designated examiner shall evaluate each candidate on the following] (b) A candidate shall verbally describe the following:

(i) delivering the post landing announcement;

(ii) ensuring passengers remain seated;

(iii) activating cabin lights prior to disembarking passengers;

(iv) following procedures for doors to be opened; and

(v) ensuring that procedures are in place for passengers to be disembarked.

3.9 Anticipated or prepared emergency landing and ditching evaluation criteria

(a) **[Each]** A candidate shall perform at least one anticipated or prepared land **[and]** or one anticipated or prepared water ditching simulated emergency.

(b) To ensure understanding of operational differences, the assessment shall be performed with candidates in a multi-crew environment and also single cabin crew member environment, as applicable.

(c) Where the multi-crew drill is performed, the number of candidates that could participate at any time shall be appropriate to the cabin simulator configuration.

(d) **[Each]** A candidate shall assume an actual crew position and shall perform the designated evacuation responsibilities for that position;

(e) Where a double cabin crew member seat is available and would normally be occupied by two crew members the assessment shall be conducted to reflect this reality.

(f) The assessment variables shall include –

(i) unserviceable exits;

(ii) inflation devices that fail or only partially inflate;

(iii) aircraft attitude which necessitates a decision to use the exit or redirect passengers;

(iv) poor visibility caused by darkness or smoke;

(v) incapacitated flight crew members;

(vi) exits which become unusable during the evacuation;

(vii) passengers in panic;

(viii) failure of aircraft emergency systems such as lighting, evacuation and communication signal;

(ix) decompression; and

(x) situation requiring altering of commands.

(g) **[The]** A cabin designated examiner shall evaluate each candidate on the following **[–]**:

(i) recognising the in-flight emergency signal from the flight deck and reacting according to procedures;

(ii) preparing passengers, cabin and self-according to procedures and scenario;

(iii) selecting and briefing ABP to assist as required, including opening unstaffed exits, removing and launching life rafts, crowd control, assisting passengers with special needs, assisting outside the aircraft and directing people away from the aircraft or onto rafts;

(iv) applying all applicable commands, using the appropriate terminologies with clear, positive, authoritative communication techniques, appropriate for the assessment scenario;

(v) responding appropriately to the “Brace” command or signal;

(vi) recognising when and how to respond to the “Evacuate” command or signal;

(vii) activating the cabin emergency lights, where applicable;

(viii) assessing conditions inside and outside the exit to determine exit usability, throughout the evacuation;

(ix) commanding passengers to prepare for evacuation;

(x) preparing and opening the exit;

(xi) securing the exit in the fully open position;

(xii) assuming the appropriate protective position;

(xiii) initiating a passenger evacuation;

(xiv) controlling passenger flow throughout the evacuation;

(xv) performing final cabin and flight deck checks;

(xvi) removing the necessary safety equipment;

(xvii) exiting the aircraft or simulator correctly;

(xviii) demonstrating the duties and responsibilities to be completed following the evacuation scenario

(h) **[Each]** A candidate shall correctly apply procedures as related to the scenario; and

(i) **[Each]** A candidate shall identify the consequences of errors in the scenario.

[3.8] 3.10 Unanticipated or unprepared emergency landing and ditching evaluation criteria

(a) **[Each]** A candidate shall perform at least one unanticipated or unprepared land **[and]** or one unanticipated or unprepared water ditching simulated emergency.

(b) To ensure understanding of operational differences, the shall be performed with candidates in a multi-crew environment and also single

cabin crew member environment. The only exception to this will be for candidates that are employed with an operator that uses only a one cabin crew operating environment.

(c) Where the multi-crew drill is performed, the number of candidates that could participate at any time shall be appropriate to the cabin simulator configuration.

(d) **[Each]** A candidate shall assume an actual crew position and shall perform the designated evacuation responsibilities for that position.

(e) Where a double cabin crew member seat is available and would normally be occupied by two crew members the assessment shall be conducted to reflect this reality.

(f) The assessment variables shall include –

(i) unserviceable exits;

(ii) inflation devices that fail or only partially inflate;

(iii) aircraft attitude which necessitates a decision to use the exit or redirect passengers;

(iv) poor visibility caused by darkness or smoke;

(v) incapacitated flight crew members;

(vi) exits which become unusable during the evacuation;

(vii) passengers in panic;

(viii) failure of aircraft emergency systems, such as lighting, evacuation and communication signal;

(ix) decompression; and

(x) situation requiring altering of commands

(g) **[The]** A cabin designated examiner shall evaluate each candidate on the following:

(i) securing himself or herself in a cabin crew member seat using the correct mechanism and restraint system;

(ii) recognising that an emergency situation is developing and responding appropriately to the scenario;

(iii) applying all applicable commands, using the appropriate terminologies with clear, positive, authoritative communication techniques, appropriate for the assessment scenario;

(iv) responding appropriately to the “Brace” command or signal;

(v) recognising when and how to respond to the “Evacuate” command or signal;

(vi) activating the cabin emergency lights, where applicable;

(vii) assessing conditions inside and outside the exit to determine exit usability, throughout the evacuation;

(viii) locating and donning the life jacket during the anticipated or prepared ditching assessment;

(ix) commanding passengers to prepare for evacuation;

(x) preparing and opening the exit;

(xi) securing the exit in the fully open position;

(xii) assuming the appropriate protective position;

(xiii) initiating a passenger evacuation;

(xiv) controlling passenger flow throughout the evacuation;

(xv) performing final cabin and flight deck checks;

(xvi) removing the necessary safety equipment; and

(xvii) exiting the aircraft or simulator correctly.

(h) **[Each]** A candidate shall correctly apply procedures as related to the scenario; and

(i) **[Each]** A candidate shall identify the consequences of errors in the scenario.

[3.9]3.11 Simulated fire fighting evaluation criteria

(a) **[Each]** A candidate shall participate in a simulated fire fighting drill using the relevant equipment and simulated fire fighting techniques.

(b) The furnishings used shall be similar to or the same as those found on board the aircraft [in the operator's fleet] and these include seats, galley units, panels, waste bins and overhead bins.

(c) Fire extinguishers used for simulated fire fighting shall be similar to or the same as those found on board the aircraft [in the operator's fleet], with respect to weight, dimensions, controls and operations.

(d) Portable breathing equipment used for simulated fire fighting shall be similar to or the same as those found on board the aircraft [in the operator's fleet].

(e) A PBE used for training does not have to be operational but shall be representative of an actual smokehood.

(f) Fire gloves used for simulated fire fighting shall be similar to or the same as those found on board the aircraft **[in the operator's fleet].**

(g) Simulated fire fighting assessments, from any of the known fire classes, shall be conducted in at least two [each] of the following locations **[–]**:

(i) cabin area – under seat, seat when electrically operated, overhead bin or closet;

(ii) galley area – garbage bin, upper electrical panel or oven;

(iii) confined area – lavatory waste bin; **[and]**

(iv) hidden area – behind panels.

(h) **[The]** A cabin designated examiner shall evaluate the candidate on the following **[–]**:

(i) recognising or identifying the problem;

(ii) correctly locating the source of the simulated fire using the appropriate technique and equipment;

(iii) effective use of communication and coordination procedures throughout the drill by notifying fellow flight crew members of the situation, establishing and maintaining communication with the flight crew, providing clear, concise information to the PIC and relocating passengers;

(iv) responding in a timely manner;

(v) effectively using or simulating the use of the necessary emergency equipment; and

(vi) following appropriate extinguishing and post fire monitoring techniques.

[3.10] 3.12 Live fire fighting evaluation criteria

(a) Every 36 months, a candidate shall extinguish live fires using the relevant equipment and fire fighting techniques.

(b) Fire extinguishers used for live fire fighting shall be charged with an environmentally friendly agent.

(c) A PBE used for training does not have to be operational but shall be representative of an actual smokehood.

(d) Live fire fighting assessments, from any of the known fire classes, shall be conducted in at least two of the following locations –

(i) cabin area –under seat, on seat when electrically operated, overhead bin or closet;

(ii) galley area – garbage bin, upper electrical panel or oven;

(iii) confined area – lavatory waste bin;

(iv) hidden area – behind panels.

(e) A candidate shall recognise or identify the problem;

(f) A candidate shall correctly locate the source of the fire using the appropriate technique and equipment;

(g) A candidate shall use effective communication and coordination procedures throughout the drill, such as notifying fellow cabin crew members of the situation, establishing and maintaining communication with the flight crew, providing clear, concise information to the PIC and relocating passengers;

(h) A candidate shall respond in a timely manner;

(i) A candidate shall effectively use an actual fire extinguisher, correctly applied to an actual fire, while wearing PBE and gloves;

(j) A candidate shall correctly use fire fighting equipment consistent with the type of fire, location of the fire and maximum effective position of the fire extinguisher; and

(k) A candidate shall follow appropriate extinguishing and post fire monitoring techniques.

3.13 Wet ditching evaluation criteria

(a) Every 36 months, a candidate shall protect and sustain his or her safety in water, while assisting passengers to do the same.

(b) Life jackets used for this drill shall be representative of the type typically found on board an aircraft.

(c) Life rafts used for this drill shall be representative of the type typically found on board an aircraft.

(d) A candidate shall correctly identify the inflation lanyard for the life raft.

(e) A candidate shall identify the quick release mechanism while verbally describing the procedure to release the raft from the aircraft.

(f) A candidate shall don a life jacket and secure it to the body correctly.

(g) A candidate shall inflate the life jacket using the manual inflation tube.

(h) A candidate shall enter the water within 5 seconds of being given the command to do so.

(i) A candidate shall assume the individual heat escape posture for a minimum of 10 seconds in water.

(j) A candidate shall assume the group huddle position for a minimum of 15 seconds in water.

(k) A candidate shall move in water for a minimum distance of 15 metres.

(l) A candidate shall cover the required distance in no longer than 2 minutes.

(m) A candidate shall board the raft, from water, without any assistance, within 10 minutes of being given the command to do so.

(n) A candidate shall deflate the life jacket manually.

3.14 Pilot incapacitation evaluation criteria

(a) **[Each]** A candidate shall apply the procedures relating to an incapacitated pilot.

(b) The assessment shall be performed using either an actual flight deck seat or one that is representative of a flight crew seat with all the required control mechanisms, as used on the aircraft **[in the operator's fleet]**.

(c) **[The]** A cabin designated examiner shall evaluate the candidate on the following **[–]**:

(i) moving the pilot away from the flight controls;

(ii) correctly fastening and locking the restraint system;

(iii) positioning the pilot seat correctly, using the controls in a horizontal, vertical and recline position.

(iv) administering first aid as necessary;

(v) demonstrating the use of the oxygen system on the flight deck; and

(vi) applying crew co-ordination and communication procedures to assist the remaining flight crew member.

[3.15 Cabin crew member incapacitation evaluation criteria

(a) [Each] A candidate shall apply the procedures relating to an incapacitated cabin crew member in the environment that the cabin crew member would operate in when onboard the [operator's] aircraft [such as] in a multi-crew [and single cabin crew] environment, if applicable.

(b) The exercise shall be performed using either an actual cabin crew seat or one that is representative of a cabin crew seat with all the required control mechanisms.

(c) [The] A cabin designated examiner shall evaluate the candidate on the following [–]:

(i) identifying or responding to the problem;

(ii) effective securing of the incapacitated cabin crew member;

(iii) administering first aid, as required;

(iv) informing the flight crew; and

(v) reassigning of cabin crew stations, if applicable.]";

(k) the deletion of technical standards 64.01.11 and 64.01.12.

AMENDMENT OF SA-CATS 66

4. Document SA-CATS 66 is hereby amended by the substitution of technical standard 66.01.9 of the following technical standard:

"**66.01.9 VALIDATION OF LICENCE ISSUED BY APPROPRIATE AUTHORITY**

(1) Requirements and conditions

(a) The Director may recognise an AME licence and rating issued by an appropriate authority of a Contracting State if the standard of such foreign licence or rating is deemed to be equivalent to the standard required for issuance of a South African licence or rating, subject to the following:

(i) A licence or training from another Contracting State that has a significant safety concern or falls below the world average effective implementation in the areas of licensing, organisation or legislation, as determined by an ICAO Universal Safety Oversight audit or Mandatory Information Request, may not be accepted by the Director; and

(ii) an applicant has successfully completed a Civil Aviation Regulations and SA-CATS examination written at the offices of the Authority if, such an applicant has undergone training at an approved ATO.

(b) The period of effectiveness of the validation shall not extend beyond the date of expiry of the appropriate authority licence or for a period of 12 months, whichever comes first.

(2) Renewal of validation

(a) The circumstances and conditions, referred to in CAR 66.01.9(5), for the renewal of a validation, are the following:

(i) for maintenance carried out within the borders of South Africa, a validation is renewed only once;

(ii) the Director may grant consent for a second revalidation renewal period, only in instances where an applicant satisfies the Director

that he or she is in possession of a permanent residence permit and holds a work permit.

(iii) an applicant shall apply for a South African AME licence after the expiry of a second validation renewal period.

(b) In the case of validation of a foreign aircraft maintenance engineer licence, where a holder of such licence will be responsible for maintaining a South African registered aircraft in a foreign country, a validation may be reissued annually, provided that−

(i) the maintenance is performed exclusively outside the borders of the Republic;

(ii) the period of effectiveness of the validation shall not extend beyond the date of expiry of the appropriate authority licence or for a period of 12 months, whichever comes first; and

(iv) the application is accompanied by proof of employment stating that the applicant will solely be working outside of the borders of the Republic.".

AMENDMENT OF SA-CATS 67

5. Document SA-CATS 67 is hereby amended by –

(a) the substitution for Schedule 14 of the SA-CATS 67 of the following Schedule:

"**SCHEDULE 14: PROTOCOL ON DIAGNOSED ADDISON'S DISEASE**

1.1 APPLICABILITY

(1) This protocol applies to applicants or holders of Class 1, 2, 3, and 4 medical certificates.

1.2 RESTRICTIONS

(1) An applicant or holder who applies for Class 1 shall be limited to OML restriction.

(2) An applicant or holder who applies for Class 2 shall be restricted to a safety pilot or a multi-crew environment whenever carrying passengers, provided that corticosteroids are carried and available for use whilst exercising the privileges of the applicable licence.

(3) ATC Restrictions - Under supervision.

(4) Class 4 applications shall be assessed on a case-by-case basis.

1.3 GENERAL INITIAL MEDICAL REQUIREMENTS

(1) An applicant or holder of a medical certificate with Addison's disease must be aware that in the context of the illness, particularly diarrhoea and vomiting where absorption of corticosteroids is not reliable, they may be in danger of developing an adrenal crisis.

(2) An applicant or holder of a medical certificate with Addison's disease may need supplementary I.V. corticosteroid cover if unwell and if corticosteroids cannot be kept in due to illness, medical assistance should be obtained immediately.

(3) An applicant or holder of a medical certificate diagnosed with Addison's disease is unfit on diagnosis for a period of 3 months and shall be referred to the Medical Assessor for consideration by the AMC.

(4) An applicant or holder of a medical certificate with Addison's disease may be assessed as medically fit, provided that corticosteroids are carried and available for use whilst exercising the privileges of the applicable licence.

(5) An applicant or holder of a medical certificate with Addison's disease needs 'sick day' rules, during any illness, the dosage of corticosteroids shall be temporarily doubled until well.

(6) An applicant or a holder of a medical certificate with Addison's disease shall wear a medical alert bracelet at all times.

(7) An applicant or a holder of a medical certificate with Addison's disease must readily remove themselves from duty, when they feel unwell.

(8) An applicant or a holder of a medical certificate shall submit the following:

(a) Urea and Creatinine (U& E);
(b) Full Blood Count (FBC);
(c) Adrenocorticotropic Hormone; (ACTH);
(d) If available from time of diagnosis: cortisol levels (prior to medical therapy);
(e) ACTH levels, results of Synachten stimulation test; and
(f) Any imaging/testing done to investigate the cause.

(9) An applicant or holder of a medical certificate shall submit an annual Endocrinologist or Specialist Physician report, which shall include−

(a) the patient's symptoms;
(b) the presence of other coexisting autoimmune diseases autoimmune Polyglandular Syndrome (APS2); and
(c) the patient's blood pressure and testing for orthostatic hypotension (BP) that is taken at least twice, standing and lying.

(10) An applicant must supply the dosage of medications used including any side effects experienced.

(11) If the chronic corticosteroid dose is more than an equivalent of Prednisone 20mg per day, an applicant shall be assessed as temporarily medically unfit.

1.4 FOLLOW- UP REPORTS

(1) An applicant or holder of a medical certificate shall submit an annual Endocrinologist or Specialist Physician report, which shall include-

(a) the patient's symptoms,

(b) the presence of other coexisting autoimmune diseases, and

(c) the patient's blood pressure and testing for orthostatic hypotension (BP taken at least twice standing and lying);

(2) The dosage of medications used shall be supplied, including any side effects, if experienced.

(3) If the chronic corticosteroid dose is more than the equivalent of Prednisone 20mg per day, the applicant must be assessed as temporarily medically unfit.

(4) An applicant or a holder of a medical certificate shall submit U&E, FBC, ACTH.";

(b) the substitution of Schedule 21 for the following Schedule:

"**SCHEDULE 21: PROTOCOL ON OPHTHALMIC CONDITIONS**

1. CATARACT

1.1 APPLICABILITY

(a) This protocol applies to an applicant or holder of Class 1, 2, 3 and 4 medical certificates.

1.2 GENERAL AND INITIAL REPORTS

(a) An applicant or holder of a medical certificate who has undergone cataract surgery shall be deemed to be medically unfit.

(b) A medically fit assessment may be considered 6 weeks post-surgery unless an applicant underwent complex surgery.

(c) An applicant or holder of a medical certificate shall submit an Ophthalmology assessment report, declaring complete recovery and to ensure achievement of acceptable visual acuity with lens implant, spectacles or contact lenses.

(d) The final decision in these cases is based on the ophthalmology report and will be reviewed on a case–by–case basis by a Medical Assessor.

1.3 FOLLOW-UP REPORTS

(a) An applicant or holder of a medical certificate shall submit an optometrist or ophthalmologist report in a year after certification or after he or she has been declared medically fit.

(b) Thereafter, screening by DAME during aviation medical examination shall be conducted.

2. GLAUCOMA

2.1 APPLICABILITY

(a) This protocol applies to applicants and holders of Class 1, 2, 3 and 4 medical certificates.

2.2 GENERAL INFORMATION AND INITIAL REPORTS

(a) An applicant or holder of a medical certificate with Glaucoma caused by secondary or underlying disease such as anterior uveitis, shall treat the underlying disease before consideration.

(b) Primary Open Angle Glaucoma is chronic and incurable but can be controlled.

(c) An applicant or holder of a medical certificate diagnosed with closed angle Glaucoma, should not be passed until the condition has been surgically corrected.

(d) The medical fitness for flying of an applicant or holder of a medical certificate shall depend on the medications they are taking to control the disease and the medication side effects.

(e) An applicant or holder of a medical certificate shall submit a comprehensive Ophthalmologist report which shall include information on the following:

(i) best corrected visual acuity,

(ii) intra-ocular pressures,

(f) evaluation of the optic discs,

(g) visual field studies; and

(h) assessment of side effects of the medications.

(i) The following medications are acceptable in aviation for the treatment of Glaucoma:

(i) topical drops of Carbonic Anhydrase Inhibitors;

(ii) topical Beta blockers;

(iii) topical prostaglandin analogues; and

(iv) alpha agonists.

2.3 FOLLOW-UP REQUIREMENTS

(a) An applicant or holder of a medical certificate shall submit a comprehensive Ophthalmologist report annually.

(b) The report referred to in paragraph (a) shall include information on the following:

(i) best-corrected visual acuity;

(ii) intra-ocular pressures;

(i) evaluation of the optic discs;

(ii) visual field studies; and

(iii) assessment of side effects of the medications.

(c) An applicant or holder of a medical certificate who presents with Open Angle Glaucoma controlled with drugs shall submit an annual ophthalmological review, including perimetry or 6 monthly reviews, if severe.

3. GLAUCOMA SURGERY AND LASER PROCEDURES FOR GLAUCOMA

3.1 APPLICABILITY

(a) This protocol applies to an applicant and holders of Class 1, 2, 4 and 4 medical certificates.

3.2 INITIAL REPORTS

(a) An applicant or holder of a medical certificate shall submit an Ophthalmologist report including a report on the procedure, full details of the treatment carried out, current management, post-operation near and distant visual acuities, visual fields, and intraocular pressures, to a Medical Assessor.

(b) Restrictions that were imposed by the AMC shall be reviewed on a case-by-case basis.

3.3 FOLLOW-UP REPORTS

(a) An applicant or holder of a medical certificate shall submit an annual ophthalmologist report.

4. RETINAL DETACHMENT AND RETINAL DETACHMENT SURGICAL PROCEDURES

4.1 APPLICABILITY

(a) This protocol applies to an applicant and holder of Class 1, 2, 3 and 4 medical certificates.

4.2 GENERAL REQUIREMENTS AND AEROMEDICAL CONSIDERATIONS

(a) An applicant or holder of a medical certificate with a medical history of retinal surgery will be deemed medically unfit.

(b) All cases shall be referred to the AMC for review and the cases will be assessed on a case-by-case basis.

(c) An applicant or holder of a medical certificate who has recently had a retinal detachment treated by injecting gas into the eyeball will be at risk of adverse effects on vision if exposed to low atmospheric pressure at high altitude.

(d) An applicant or holder of a medical certificate who has undergone a retinal detachment surgical procedure shall avoid air travel until the gas bubble resorbs. This applies to all applicants, regardless of the type of aircraft being operated (pressurised or non-pressurised).

(e) In all cases of retinal detachment, once the condition is stabilized, a comprehensive ophthalmologist report and a computerized visual field plot are mandatory before considering an applicant for return to aviation duties. The assessed applicant or holder of a medical certificate shall retain a copy of the plot for future comparison. The Ophthalmologist report shall confirm the presence or absence of post-operative ocular motility issues (except with vitrectomy) or incorporate an orthoptic report.

(f) An applicant or holder of a medical certificate with a medical history of Retinal Detachment shall be assessed as medically unfit until the underlying condition has been addressed and treated.

(g) A medically fit assessment may be considered 6 months after successful retinal detachment surgical intervention.

(h) A medically fit assessment may be considered earlier for an applicant who has undergone retinal laser therapy. An applicant or a holder of a medical certificate may be considered after a minimum of 6 weeks period post laser therapy if there are no retinal breaks or detachments.

(i) Should an applicant or holder of a medical certificate present with any ophthalmic pathology reflecting a serious systemic disease (e.g. diabetic or hypertensive retinopathy), all pertinent medical information and status reports on the systemic disease will be required.

(j) An applicant or holder of a medical certificate who presents with macular involvement indicates a poor prognosis and should be considered on a case-by-case basis by AMC.

4.3 INITIAL MEDICAL REPORTS REQUIRED

(a) An applicant or holder of a medical certificate with a history of retinal detachment shall submit an Ophthalmologist report containing the following:

(i) full recovery from successful treatment and detailing the underlying aetiology;

(ii) the management of the condition;

(iii) the ophthalmic surgical procedure (whether silicon oil or gas); and

(iv) visual fields and comment on whether the condition is unilateral or bilateral.

(b) The Ophthalmologist report shall either confirm the absence of post-operative ocular motility challenges (except with vitrectomy) or incorporate an orthoptic report.

(c) An applicant or holder of a medical certificate shall submit all pertinent medical information and current status reports from the treating physician

where an applicant's ophthalmic pathology reflects a systemic disease such as diabetic and hypertensive retinopathy.

4.4 FOLLOW-UP MEDICAL REPORTS

(a) An applicant or holder of a medical certificate who has undergone retinal detachment surgery will be dealt with on a case-by-case- basis (as there are multiple causes, types and classifications of retinal detachments and they carry different prognosis).

5. KERATOCONUS

5.1 APPLICABILITY

(a) This protocol applies to an applicant or a holder of Class 1 2, 3 and 4 medical certificates.

5.2 GENERAL INFORMATION AND AEROMEDICAL CONSIDERATIONS

(a) Keratoconus is a progressive disease and an applicant or holder diagnosed with keratoconus shall be declared medically unfit on diagnosis and shall be assessed on a case-by-case basis.

(b) It must be noted that if the principal meridians are not at right angles, the astigmatism is called irregular. Irregular astigmatism occurs when there has been corneal scarring from any cause and in the developmental abnormality keratoconus.

5.3 INITIAL MEDICAL REPORTS REQUIRED

(a) An applicant or holder of a medical certificate with a history of keratoconus shall submit an Ophthalmologist report which shall include refractive errors and phorias.

5.4 FOLLOW-UP REPORTS

(a) An applicant or holder of a medical certificate with a history of keratoconus shall be dealt with on a case -by-case basis.

6. CORNEAL CROSS-LINKING

6.1 APPLICABILITY

(a) This protocol applies to an applicant or a holder of Class 1, 2, 3 and 4 medical certificates.

6.2 GENERAL INFORMATION AND INITIAL REPORTS

(a) Collagen cross-linking is a minimally invasive procedure used to prevent the progression of corneal ectasia such as keratoconus and post-LASIK ectasia.

(b) Due to the risk of corneal haze following this procedure and assessment for dysphotopsia is required.

(c) It takes approximately one year for the visual acuity to stabilize following corneal cross-linking.

(d) An applicant or holder of a medical certificate may apply for recertification at 12 months post cross-linking procedure.

6.3 INITIAL MEDICAL REPORTS REQUIRED

(a) An applicant or holder of a medical certificate shall provide an ophthalmology assessment conducted at 6 months post-operation and at 12 months post-operation.

(b) The Ophthalmologist report must include−

(i) corneal topography;

(ii) refractive status;

(iii) visual acuity; and

(iv) assessment for dysphotopsia (due to the risk of corneal haze following corneal crosslinking procedure).

(c) An applicant or holder of a medical certificate shall submit all pertinent medical information and current medical status report from the treating physician where the applicant's ophthalmic pathology reflects a systemic disease or underlying medical condition.

6.4 FOLLOW-UP REPORTS

(a) An applicant or holder of a medical certificate shall submit 6 monthly Ophthalmologist reports.

7. EYE INJURIES

7.1 APPLICABILITY

(a) This protocol applies to an applicant or holder of Class 1, 2, 3 and 4 medical certificates.

7.2 GENERAL AND INITIAL REPORTS

(a) An applicant or holder who sustained eye injuries shall, post recovery be referred to the Medical Assessor for review. Severe or significant eye injuries will be referred to the AMC for review.

(b) An applicant or holder of a medical certificate who sustained eye injury should be assessed for any dysphotopsia symptoms before they undergo a fitness assessment and may be asked to undergo an objective assessment of contrast sensitivity and glare sensitivity if there are concerns.

7.3 INITIAL REPORTS REQUIRED

(a) An applicant or holder of a medical certificate with a history of acute eye injury shall submit a comprehensive Ophthalmologist report commenting on dysphotopsia symptoms post recovery.

(b) An applicant or holder of a medical certificate may be required to undergo objective assessment of contrast sensitivity and glare sensitivity if there are concerns.

7.4 FOLLOW-UP MEDICAL REQUIREMENTS

(a) Follow-up reports and requirements shall be determined on a case-by-case basis.

8. ANTERIOR UVEITIS

8.1 APPLICABILITY

(a) This protocol applies to an applicant or a holder of Class 1, 2, 3 and 4 medical certificates.

8.2 GENERAL AND INITIAL REPORTS

(a) An applicant or holder of medical certificate diagnosed with anterior uveitis shall be assessed as medically unfit on diagnosis.

(b) Anterior uveitis may be sporadic or be associated with systemic diseases.

(c) All cases with Anterior Uveitis shall be submitted to the Medical Assessor for consideration.

(d) An applicant or holder of a medical certificate diagnosed with Anterior Uveitis may be declared medically fit once the condition has resolved, and the applicant has stopped all medication.

8.3 INITIAL REPORTS

(a) An applicant or holder of a medical certificate diagnosed with Anterior Uveitis shall submit a comprehensive Ophthalmologist report including visual acuity, visual fields and medication.

(b) An applicant or holder of a medical certificate diagnosed with Anterior Uveitis shall submit a treating specialist report including results of any systemic investigations, medication and control of any underlying cause.

8.4 FOLLOW-UP REPORTS

(a) An applicant or holder of a medical certificate shall submit an Ophthalmologist report commenting on dysphotopsia symptoms and frequency of reports will be assessed on a case-by-case basis; and

(b) A treating specialist report including results of any systemic investigations, medication and control of any underlying cause.

9. POSTERIOR UVEITIS

9.1 APPLICABILITY

(a) This protocol applies to an applicant or holder of Class 1, 2, 3 and 4 medical certificates.

9.2 GENERAL AND AEROMEDICAL CONSIDERATIONS

(a) An applicant or holder of a medical certificate shall be assessed as medically unfit on diagnosis of Posterior Uveitis.

(b) Posterior Uveitis may be associated with an underlying disease such as inflammatory bowel disease and sarcoidosis.

9.3 INITIAL REPORTS

(a) An applicant or holder of a medical certificate shall submit an Ophthalmologist report including but not limited to visual acuity visual fields and medication.

(b) An applicant or holder of medical certificate shall submit a treating specialist report including results of any systemic investigations, medication, and control of any underlying cause.

9.4 FOLLOW-UP REPORTS

(a) An applicant or holder of a medical certificate shall submit an annual Ophthalmologist report on dysphotopsia symptoms; and

(b) A treating specialist report including results of any systemic investigations, medication and control of any underlying cause.

10 KERATITIS

10.1 APPLICABILITY

(a) This protocol applies to an applicant or holder of Class 1 2, 3 and 4 medical certificates.

10.2 GENERAL AND INITIAL REPORTS

(a) An applicant or holder of a medical certificate with the diagnosis of Keratitis shall be assessed as medically unfit on diagnosis.

(b) A case with a history of Keratitis shall be reviewed by the medical assessor once the condition has resolved and the applicant has stopped all medication.

10.3 INITIAL REPORTS

(a) An applicant or holder of a medical certificate shall submit an Ophthalmologist report commenting on residual corneal scarring, glare sensitivity, contrast sensitivity, dysphotopsia and other complications.

10.4 FOLLOW-UP REPORTS

(a) Follow-up requirements and reports shall be assessed on a case-by-case basis.

11. CENTRAL SEROUS RETINOPATHY

11.1 APPLICABILITY

(a) This protocol applies to an applicant or holder of Class 1, 2, 3 and 4 medical certificates.

11.2 GENERAL

(a) An applicant or holder of a medical certificate diagnosed with serious retinopathy shall be assessed as medically unfit on diagnosis.

(b) Consideration of fitness status is possible when the condition has resolved or when no further improvement to vision is expected, provided that the visual standards are met.

11.3 INITIAL MEDICAL REPORTS REQUIRED

(a) An applicant or holder of a medical certificate shall submit a comprehensive Ophthalmologist report with central visual fields such as macula threshold that may be required in cases where reduced vision or visual distortion (metamorphopsia) remains present.

11.3 FOLLOW-UP MEDICAL REPORT

(a) An applicant or holder of a medical certificate shall submit an annual ophthalmologist report

12. ACQUIRED DISORDERS OF THE MACULA

12.1 APPLICABILITY

(a) This protocol applies to an applicant or holder of Class 1, 2, 3 and 4 medical certificates.

12.2 GENERAL AND INITIAL REPORTS

(a) Macular disorders can cause significant metamorphopsia without necessarily reducing vision to below acceptable limits.

(b) Consideration shall be given to the potential drug side effects of treatment of systemic disorders such as rheumatoid arthritis or malaria.

12.3 INITIAL REPORTS

(a) An applicant or holder of a medical certificate shall submit an Ophthalmologist report with central visual fields.

(b) An applicant or holder shall be assessed on a case-by-case basis.

12.4 FOLLOW-UP REPORT MEDICAL REQUIREMENTS

(a) Follow-up requirements of an applicant or holder of a medical certificate will be assessed on a case-by-case basis.

13. OPTIC DISC DRUSEN

13.1 APPLICABILITY

(a) This protocol applies to an applicant or a holder of Class 1,2, 3 and 4 medical certificates.

13.2 GENERAL AND INITIAL REPORTS REQUIREMENTS

(a) An applicant or holder diagnosed with optic disc drusen shall be assessed medically unfit on diagnosis.

13.3 INITIAL REPORTS REQUIRED

(a) An applicant or holder shall submit an Ophthalmologist assessment report including visual fields.

13.4 FOLLOW-UP MEDICAL REPORT

(a) Follow-up requirements of an applicant or holder will be assessed on a case-by-case basis.

14. OPTIC LENSES

14.1 APPLICABILITY

(a) This protocol applies to Class 1, 2, 3 and 4 holders of pilot medical certificates.

14.2 GENERAL REQUIREMENTS (WHEN OPERATING AN AIRCRAFT)

(a) Multifocal contact lenses. are not compatible with aviation use.

(b) A holder of an aviation medical certificate is not allowed to fly with coloured lenses.

(c) The use of orthokeratology lenses is not acceptable for aviation use.

(d) A holder of an aviation medical certificate is not allowed to use lenses to alter colour perception as they are not compatible with aviation use.

(e) A holder of an aviation medical certificate is only allowed to use sunglasses with a tint of a neutral colour and the tint should not be darker

than 80% absorption. A graduated tint darkest at the top of the lens and lightening towards the bottom is acceptable.

(f) A holder of an aviation medical certificate is discouraged from using photochromic lenses.

(g) A holder of an aviation medical certificate is discouraged from the use of polarized lenses.

(h) A holder of an aviation medical certificate is discouraged from requiring a spectacle prescription and must have one clear untinted pair of correcting lenses but can have prescription sunglasses as their second pair.

(i) A holder of an aviation medical certificate is not allowed to wear non-prescription sunglasses on top of prescription glasses.

(j) An applicant or holder of an aviation medical certificate shall carry both pairs of prescription glasses that are without tint for a night while conducting flying.";

(c) the deletion in Schedule 31 of section 6;

(d) the insertion after Schedule 31 of the following schedule:

"**SCHEDULE 31A: PROTOCOL ON PROSTRATE CANCER**

1.1 General

(a) A diagnosis of prostate cancer is disqualifying and upon diagnosis, an applicant or a holder of a medical certificate shall be deemed medically unfit to exercise the privileges of the class of the licence until such an applicant or a holder of a medical certificate undergoes treatment and

has been instigated. Such an applicant or holder of a medical certificate must be fully recovered and disease-free.

(b) The outcome of prostate cancer varies greatly, and it is mostly affected by whether the cancer has spread outside the prostate gland and how abnormal the cancer cells are (the Gleason score) upon diagnosis.

(c) Most of the patients with prostate cancer that has not spread as well as some patients whose cancer has not spread very much outside the prostate gland may be cured.

(d) Furthermore, for patients who cannot be cured, hormone treatment can extend their lives by many years.

1.2 Applicability

(a) This protocol applies to an applicant or a holder of Class 1, 2, and 3 medical certificates.

1.3 Initial requirements following diagnosis

(a) An applicant or holder of a medical certificate shall be declared medically unfit on diagnosis pending receipt of satisfactory reports.

(b) An applicant or holder of a medical certificate shall submit a Urologist report, and such a report must include the following:

(i) Grade (Gleason score); Grade group score;
(ii) Stage: T and N stage: extracapsular extension, seminal vesical involvement or nodal disease if noted on MRI imaging;
(iii) for localised disease indicate Risk grouping as per recent National Comprehensive Cancer Network (NCCN) guidelines;
(iv) international prostate symptom score;
(v) any distant spread. Appropriate imaging: CT scan, Chest, Abdomen and Pelvis, Bone scan, Prostate-Specific Membrane Antigen (PSMA) PET;

(vi) pre and post-treatment PSA. Baseline and follow up PSA dated;

(vii) imaging results: MRI, Bone scan, CT CAP, MRI;

(viii) treatment, including dates;

(ix) prognosis; and

(x) follow-up plan: clinical reviews, PSA tests, imaging.

3.1. Requirements for recertification:

(a) An applicant or holder of medical certificate must not be on radiotherapy or systemic chemotherapy;

(b) A satisfactory treatment response is demonstrated by –

(i) decrease in PSA;

(ii) full recovery from treatment;

(c) There must be no symptoms or complications that may affect flying;

(d) The time to recertification depends on treatment received; and

(e) Active surveillance requirements are:

(i) minimum quarterly Specialist reviews with PSA tests, multi-parametric MRI results and repeat biopsy if undertaken;

(ii) follow-up reports to be submitted to a DAME for Class 1 and Class 2; and

(iii) an applicant or a holder of the medical certificate with poor performance status, elderly with multiple co-morbidities and reduced life expectancy, watchful waiting reserved.

4.1 Time to recertificate after treatment

TREATMENT	Prostatectomy (TURP/ Radical)	Radiotherapy (External)	Brachytherapy (Internal)	Hormone Therapy

REQUIREMENTS	Minimum 6 weeks after	Minimum 4 weeks after last dose	Minimum 6 weeks after insertion	Minimum 4 weeks: - On maintenance dose - Stable - No side effects reported
CERTIFICATION	Unrestricted	Unrestricted	Unrestricted	Unrestricted

7.1 Restrictions

(a) Class 1

(i) curative treatment => unrestricted

(ii) palliative treatment => multicrew

(b) Class 2 - unrestricted

7.2 Follow-up Reports

(a) Annual Urologist or Oncologist report.

(b) Applicant or holder of a medical certificate is medically unfit if there is evidence of local recurrence, metastatic disease, or biochemical failure, suggesting recurrent disease.";

(e) the substitution of Schedule 36 of the following schedule:

"**SCHEDULE 36: PROTOCOL ON BENIGN PROSTATIC HYPERPLASIA (BPH)**

1.1 Applicability

(a) This protocol is applicable to an applicant or a holder of Class 1, 2, and 3 medical certificates.

1.2 Requirements

(a) An applicant for a medical certificate is required to submit an initial and any subsequent reports from a Urologist, which address the underlying cause of the Benign Prostatic Hyperplasia and the treatment if applicable.

(b) A holder of a medical certificate is required to submit follow up reports every six months from a Urologist, which address the underlying cause of the Benign Prostatic Hyperplasia and the treatment if applicable.

(c) If non-symptomatic or minimal symptoms can be managed by watchful waiting, therefore reports from a Urologist Report – Initially and 6 Months shall be submitted.

(d) A medical certificate with restrictions may be issued for Class 1 to an applicant or a holder of a medical certificate if symptoms are resolved and there are no adverse effects of treatment.

(e) A medical certificate may be unrestricted after six months if an applicant or holder of a medical certificate is still symptom-free.

(f) Before issuance of restricted or unrestricted medical certificate to an applicant or holder of a medical certificate, a Urologist Report must include –

(i) Disease-specific history;
(ii) Uroflowmetry;
(iii) PVR volume;
(iv) Renal function;
(v) Frequency volume charts (FVC); and
(vi) PSA.

(g) The acceptable medications are the following:

(i) Selective Alpha Blockers after a two-weeks grounding period (Tamsulosin 400mcg once a day;

(ii) Alfuzosin 10mg once a day and 5 Alpha-Reductase Enzyme Inhibitors after 48 hours of grounding period (Finasteride 5mg once a day); and

(iii) Dutasteride 500mcg (once a day).

(h) An applicant or holder of a medical certificate shall submit an annual Urologist report.";

(f) the substitution for Schedule 37 of the following Schedule:

"**SCHEDULE 37: PROTOCOL ON CHRONIC KIDNEY DISEASE**

1.1 Applicability

(a) This protocol applies to an applicant or a holder of Class 1, 2, and 3 medical certificates.

1.2 Requirements

(a) Chronic Kidney Disease applicant or holder of a medical certificate shall submit a Physician or Nephrologist report.

(b) If Creatinine is <200 and symptomatic, an applicant or holder of a medical certificate shall be declared medically unfit until he or she is treated and is stable.

(c) An applicant or holder of a medical certificate with chronic kidney disease with Creatinine <200 may be considered for recertification if the Physician/ Nephrologist Report provides the following:

(i) an applicant or holder of a medical certificate has been treated fully or has recovered with no current illness likely to cause instability;
(ii) Renal function is stable with normal electrolytes; and
(iii) underlying chronic medical conditions are controlled on current medication.

(d) An applicant or holder of a medical certificate shall submit a 6-monthly Physician's or Nephrologist report which shall include the following:
(i) Urea, Creatinine and Electrolytes;
(ii) Haemoglobin; and Haematocrit;
(iii) Urinalysis; and
(iv) Underlying conditions must be compatible with flying and Protocol requirements.

(e) An applicant or holder of a medical certificate presented with chronic kidney disease, with Creatinine 200-500, shall be declared medically unfit if symptomatic until he or she is treated and is stable.
(f) An applicant or holder of a medical certificate with a diagnosis of chronic kidney disease, with Creatinine 200-500, medical fitness shall be considered on a case-by-case basis after recovery.
(g) An applicant or holder of a medical certificate presented with chronic kidney disease, with Creatinine > 500 Micromole/L, shall be declared medically unfit.

An Applicant or holder of a medical certificate who requires dialysis shall be assessed as medically unfit.

1.3 Follow-up requirements

(a) An applicant or holder of a medical certificate for recertification, shall submit a 6 monthly Physician's/Nephrologist report which must include the following:

(i) normal Electrolytes;
(ii) Haemoglobin is at least 10g/dL and Haematocrit 30%;

(iii) confirmation that underlying chronic medical conditions are controlled; and

(iv) confirmation that an applicant or holder of a medical certificate condition is asymptomatic and stable on current treatment.";

(g) the insertion in Technical Standard 67.00.2 after Schedule 49 of the following Schedules:

"**SCHEDULE 50 PROTOCOL ON RENAL CALCULI**

1.1 Applicability

(a) This protocol applies to an applicant or a holder of Class 1, 2, and 3. medical certificates.

1.2 Restrictions

(a) An applicant or a holder of Class 1, 2, and 3 medical certificates with Stone Free shall not be restricted.

(b) An applicant or a holder of Class 1, 2, and 3 with Residual Stone and Recurrent Ureteric Colic: OML/OSL shall be restricted.

1.3 General medical requirements

(a) Based on the most recent event or diagnosis >= 5 years ago.

(b) An applicant or holder of a medical certificate must have no symptoms or current renal problems and the renal function must be normal.

(c) An applicant or holder of a medical certificate must have no ongoing treatment or surveillance needed.

(d) An applicant or holder of a medical certificate with a single stone that passed <5 years ago, with no complications.

(e) An applicant or holder of a medical certificate with a single stone passed or is in the bladder with no further renal problems and imaging verifies no retained stones DAME-Issues.

(f) An applicant or holder of a medical certificate with multiple or retained asymptomatic stone(s) <5 years ago with no complications.

(g) A Urologist report submitted shall confirm the following current medical status of an applicant or a holder of a medical certificate as being –

(i) asymptomatic;
(ii) stable (no increase in number or size of stones); and
(iii) unlikely to cause a sudden incapacitating event.

(h) An applicant or holder of a medical certificate who has undergone surgery, the following medical report or reports must be submitted if an applicant or a holder of a medical certificate:

(i) is off pain medication(s);
(ii) have fully recovered;
(iii) fully released from the surgeon; and
(iv) has no history of complications.

(i) Supportive treatments such as hydration or medications (thiazides, allopurinol, or potassium citrate) to decrease recurrence (with no side effects) are allowed.

(j) An applicant or holder of a medical certificate shall be assessed on a case-by-case basis and presented by a Medical Assessor to ensure an Accredited Medical Conclusion prior to reconsideration certification if such an applicant or a holder of a medical certificate presents with the following complications:

(i) Hydronephrosis (chronic);

(ii) Metabolic or underlying condition requiring treatment or surveillance or monitoring;

(iii) Procedures (3 or more for kidney stones within the last 5 years);

(iv) Renal failure or obstruction (acute or chronic);

(v) Sepsis or recurrent urinary tract infections due to stones;

(vi) Symptomatic; and

(vii) Underlying cause for recurrent stones.

1.4 Follow-up requirements

(a) An applicant or holder of a medical certificate shall submit the following reports to a Medical Assessor:

(i) Xray;

(ii) Ultrasound;

(iii) Urogram; and

(iv) Urologist Reports.

(c) An applicant or holder of a medical certificate shall be followed up for a period of seven years pending submission of favourable reports. After a period of seven follow-ups, a Medical Assessor, based on a holder of a medical certificate with favourable reports may consider discontinuing compliance with this Protocol.

SCHEDULE 51: PROTOCOL ON RENAL TRANSPLANT

1.1 Applicability

(a) This protocol applies to an applicant or a holder of Class 1, 2, 3 and 4 medical certificates.

1.2 Restrictions

(a) The following restrictions may be imposed:

(i) Class 1 – Multicrew;

(ii) Class 2 – Need Safety-pilot restriction;

(iii) Air Traffic Controller = Operate Under Supervision; and

(iv) Cabin Crew and Recreational Pilots – (Restriction may be imposed on a case-by-case basis).

1.3 Initial requirements following diagnosis

(a) An applicant or holder of a medical certificate shall be temporarily declared medically unfit after a renal transplant.

(b) An applicant or holder of a medical certificate shall submit a Physician/ Nephrologist Report discussing the aetiology of primary renal disease.

(c) An applicant or holder of a medical certificate shall submit Hospital admission notes, operative notes, and discharge summary reports.

(d) An applicant or holder of a medical certificate shall disclose any history of Hypertension or cardiac dysfunction and Blood Pressure is within normal limits on approved antihypertensive.

(e) An applicant or holder of a medical certificate shall submit Sequela prior to transplant.

(f) Renal function shall be stable, with no underlying systemic disorder likely to cause sudden change.

(g) Cardiovascular risk shall be assessed as minimal by a Cardiologist/ Physician, including exercise ECG.

(h) An applicant or holder of a medical certificate shall submit Immunosuppressive Therapy reports he or she is undergoing and side effects, if any.

(i) An applicant or holder of a medical certificate must submit the following Laboratory results:

(i) Full Blood Count;

(ii) Blood Urea and Nitrogen;

(iii) Creatinine: and

(iv) electrolytes.

(j) The Levels of anti-rejection drugs shall be within therapeutic range to minimize side effects.

(k) Steroid dosage shall be below 10mg per day.

1.4 Follow-up Reports

(a) An applicant or holder of a medical certificate shall submit :

(i) an annual Physician/Nephrologist report;

(ii) an annual cardiology review, including exercise ECG; and

(iv) other requirements test (Full Blood Count; U&E).

SCHEDULE 52: PROTOCOL ON RESTRICTIVE CARDIOMYOPATHY

1.1 Applicability

(a) This protocol is applicable to an applicant or a holder of Class 1, 2, 3 and 4 medical certificates.

1.2 Operational Restrictions

(a) Class 1-Multi-crew;

(b) Class 2-Safety Pilot; or

(c) Class 3- ATC to be paired.

1.3 General Information

(a) On initial diagnosis, an applicant or holder of a medical certificate shall be declared medically unfit.

(b) Haemochromatosis that is well controlled by venesection and presents with normal glucose tolerance, normal Echocardiogram, normal exercise ECG and normal ambulatory ECG may be considered with a restricted

medical certification and must be subjected to regular review. Amyloidosis of the heart has a very poor prognosis and those with Eosinophilic heart disease are equally problematic.

(c) An applicant or holder of a medical certificate with transfusion-dependent anaemias shall be assessed medically unfit.

1.4. Initial Requirements

(a) An applicant or holder of a medical certificate shall submit**:**

(i) a comprehensive Cardiologist report;

(i) Echocardiogram and Doppler studies;

(ii) Stress Electrocardiogram;

(iii) Cardiac MRI or Cardiac CT scan;

(iv) Chest X-ray or Chest CT scan;

(v) Fasting s-glucose; and

(vi) S-Iron studies.

1.5 Follow-up requirements

(a) The AMC shall on case-by-case basis review medical reports received and thereafter make a determination if there is a need for any follow-up reports.

SCHEDULE 53: PROTOCOL ON DILATED CARDIOMYOPATHY

1.1 Applicability

(a) This protocol applies to an applicant or a holder of Class 1, 2, and 3 medical certificates.

1.2 Operational Restrictions

(a) Class 1-Multi-crew;

(b) Class 2-Safety Pilot; or

(c) Class 3- ATC to be paired.

1.3 General

(a) In view of the generally poor prognosis, the diagnosis of dilated cardiomyopathy must be inconsistent with any form of medical certification to fly.

(b) An applicant or holder of a medical certificate with a mild global reduction in left ventricular systolic function (with the ejection fraction > 50 per cent) that has been stable for at least one year and with no evidence of electrical instability may be considered for restricted medical certification, subject to close follow-up with echocardiography and Holter monitoring. myocardial abnormality.

(c) An applicant or holder of a medical certificate shall be assessed on a case-by-case basis.

1.4 Initial Medical Requirements:

(a) An applicant or a holder of a medical certificate shall be assessed medically unfit on diagnosis of cardiomyopathy pending Aeromedical Committee review.

(b) An applicant or holder of a medical certificate shall submit the following:

(i) a comprehensive Cardiologist report;
(ii) a Stress Electrocardiogram;
(iii) an Echocardiogram with Ejection Fraction of >50% and septal thickness <1.5cm for Hypertrophic cardiomyopathy; and
(iv) 24-hour Holter Electrocardiogram.

(c) Based on the information in paragraph (b), the Aeromedical Committee may request the applicant or holder of a medical certificate to submit the following:

(i) Myocardial perfusion scan;

(ii) Coronary angiogram; and

(iii) Electrophysiological studies.

1.5 Follow-up: Annually

(a) An applicant or holder of a medical certificate shall submit:

(i) undergo routine Aviation Medical Examinations;

(iii) submit a lifelong Cardiological report;

(iii) submit an Echocardiogram; and

(iv) submit a 24-hour Holter monitoring.

SCHEDULE 54: PROTOCOL ON PERICARDITIS

1.1 Applicability

(a) This protocol applies to an applicant or a holder of Class 1, 2,3 and 4 medical certificates.

1.2 General

(a) An applicant or a holder of a medical certificate shall be declared medically unfit on diagnosis of pericarditis.

(b) An applicant or a holder of a medical certificate with a diagnosis of acute pericarditis may be considered for recertification three months after recovery subject to a satisfactory cardiology review.

(c) The medical certification of an applicant or a holder of a medical certificate following pericarditis attributable to other pathologies shall depend on the cause, completeness of resolution, clinical stability and expected long-term outcome.

1.3 Operational restrictions

(a) In accordance with the AMC outcome, an applicant or holder of a medical certificate shall be assessed on a case-by-case basis.

1.4 Initial Medical Requirements

(a) An applicant or holder of a medical certificate must be asymptomatic for a period of 3 to 6 months and thereafter he or she may apply for medical certification.

(b) An applicant or holder of a medical certificate shall submit:

(i) a Cardiologist report;
(ii) a normal Stress ECG;
(iii) a normal 24-hour Ambulatory ECG; and
(iv) a normal Echocardiogram.

(c) An applicant or holder of a medical certificate may be required to submit a Coronary Angiography or stress thallium Myocardial Perfusion Image to resolve doubt surrounding non-invasive investigations.

1.4 Follow-up reports

(a) An applicant or a holder of a medical certificate shall be required to provide an annual follow-up cardiologist report.

"**SCHEDULE 55 PROTOCOL ON MYOCARDITIS**

1.1 Applicability

(a) This protocol applies to an applicant or a holder of Class 1, 2, 3 and 4 medical certificates.

1.2 Restrictions

(a) In accordance with the AMC outcome, an applicant or holder of a medical certificate shall be assessed on a case-by-case basis.

1.3 Initial Medical Requirements

(a) An applicant or a holder of a medical certificate shall be assessed medically unfit on a diagnosis of myocarditis pending Aeromedical Committee review.

(b) An applicant or holder of a medical certificate shall submit the following:

(i) a Cardiology assessment report;

(ii) an MRI scan;

(iii) a 24-hour Holter electrocardiogram;

(iv) Stress Electrocardiogram; and

(v) Echocardiogram which shall show to have returned to normal (i.e. have no evidence of impaired left or right ventricular function) and any evidence of increasing (left or right) ventricular internal diameters and reduction of systolic or diastolic function is incompatible with certification.

1.4 Follow-up Requirements

(a) An applicant or holder of a medical certificate shall provide the following, annually:

(i) Cardiologist assessment report; and
(ii) Echocardiogram.

SCHEDULE 56: PROTOCOL ON ENDOCARDITIS

1.1 Applicability

(a) This protocol is applicable to an applicant or a holder of Class 1, 2, 3 and 4 medical certificates.

1.2 General

(a) The diagnosis of acute endocarditis illness disqualifies all forms of medical certification to fly.

(b) Once an applicant or holder has suffered an episode of Endocarditis, recertification depends on good residual function of the heart as adjudicated by standard non-invasive techniques.

(c) The medical disease outcome is influenced favourably if renal and myocardial functions are normal after an attack, and there has been no systemic embolism.

(d) Involvement of the mitral or aortic valve, if it does not lead to significant regurgitation, may leave sterile vegetation that provides a nidus for cerebral embolism and re-infection.

1.3 Operational Restrictions

(a) In accordance with the AMC outcome, an applicant or holder of a medical certificate shall be assessed on a case-by-case basis.

1.4 Initial medical requirements following diagnosis

(a) An applicant or holder of a medical certificate shall submit the following:

(i) a comprehensive report from the treating Physician or Cardiologist;
(ii) a Cardiothoracic surgeon's report;
(iii) an Echocardiogram;
(iv) an Electrocardiogram (ECG);
(v) a Chest X-ray; and
(vi) S-U&E and S-FBC (Bloods).

(b) Based on the information from the treating Cardiologist's report, the AMC may request an applicant or holder of the medical certificate to submit the following:

(i) Computerized Tomography scan (CT); or

(ii) Magnetic resonance imaging (MRI).

1.5 Follow-Up

(a) The AMC may request an applicant or a holder of a medical certificate to submit an initial six-monthly follow-up report and thereafter submit an annual report.

(b) An applicant or holder of the medical certificate shall provide 6 monthly Cardiologist assessment reports.

SCHEDULE 57: PROTOCOL ON CARDIAC INFECTIONS

1.1. Applicability

(a) This protocol is applicable to an applicant or a holder of Class 1, 2, 3 and 4 medical certificates.

1.2 General

(a) An applicant or a holder of a medical certificate shall be declared medically unfit on diagnosis of cardiac infection, pending Aeromedical Committee review.

(b) An applicant or a holder of a medical certificate may apply for medical certification or recertification if asymptomatic for 3 to 6 months.

(c) An applicant or a holder of a medical certificate may be required to provide Coronary angiography or stress thallium MPI. to resolve doubt surrounding non-invasive investigations.

(d) The medical certification of a flight crew member following pericarditis attributable to other pathologies shall depend on the cause, completeness of resolution, clinical stability and expected long-term outcome.

1.3 Operational restrictions

(a) In accordance with the AMC outcome, an applicant or holder of a medical certificate shall be assessed on a case-by-case basis.

1.4 Initial Medical Requirements

(a) An applicant or holder shall provide the following reports, once he or she is asymptomatic for 3 to 6 months to the AMC:

(i) a Cardiologist assessment report;
(ii) a normal Stress Electrocardiogram;
(iii) an Echocardiogram;
(iv) a 24-Hour Holter Electrocardiogram;

a Coronary Angiography or Stress Thallium MPI at the discretion of the AMC on review.

1.5 Follow-up requirements

(a) An applicant or holder of a medical certificate shall be followed up in accordance with the AMC outcome and on a case-by-case basis.

SCHEDULE 58: PROTOCOL ON CARDIAC TRANSPLANT

1.1 Applicability

(a) This protocol is applicable to an applicant or a holder of Class 2, 3 and 4 medical certificates.

1.2 General

(a) An applicant or a holder of a medical certificate shall be assessed medically unfit on diagnosis of cardiac infection, pending Aeromedical Committee review.

(b) An applicant or a holder of a medical certificate may apply for medical certification or recertification if asymptomatic for 3 to 6 months.

(c) An applicant or a holder of a medical certificate may be required to provide Coronary angiography or stress thallium MPI. to resolve doubt surrounding non-invasive investigations.

(d) The medical certification of a flight crew member following pericarditis attributable to other pathologies shall depend on the cause,

completeness of resolution, clinical stability and expected long-term outcome.

(e) History of cardiac transplant is disqualifying for Class 1 medical certification.

1.3 Operational restrictions

(b) In accordance with the AMC outcome, an applicant or holder of a medical certificate shall be assessed on a case-by-case basis.

1.4 Initial Medical Requirements

(a) An applicant or holder of a medical certificate may only be considered after 12 months of recovery has lapsed after the cardiac transplant before consideration.

(b) An applicant or holder of a medical certificate shall –

(i) undergo a routine aviation medical examination;

(ii) provide a comprehensive Cardiothoracic Surgeon's report;

(iii) provide a comprehensive Cardiologist's assessment;

(iv) provide a statement regarding functional capacity, modifiable CVS risk factors and prognosis for incapacitation;

(v) provide a Coronary angiogram (for detection of atherosclerosis);

(vi) provide a 24-hour Holter Electrocardiogram monitor recording;

(vii) provide a Doppler echocardiogram; and

(viii) provide current blood chemistry (fasting blood sugar, haemoglobin A1C concentration, and blood lipid profile to include total cholesterol, HDL, LDL, and triglycerides);

(c) If all the investigations and the cardiologist's report are satisfactory, Class 2 and Class 3 applicant or a holder of a medical certificate may be recertificated on a case-by-case basis.

1.5 Follow-up reports

(a) An applicant or holder of a medical certificate shall submit a Cardiologist assessment report annually.

SCHEDULE 59: PROTOCOL ON ENDOCARDIAL PACEMAKER

1.1 Applicability

(a) This protocol is applicable to an applicant or a holder of Class 1, 2, 3 and 4 medical certificates.

1.2 Operational restrictions

(a) Class 1: Multi-crew.

(b) Class 2: No operational restrictions.

(c) Class 3: No operational restrictions (an applicant or a holder of a medical certificate to confirm if there is no interference with the equipment).

(d) Class 4: Cabin Crew: No operational restrictions.

1.3 General

(a) An applicant or holder of a medical certificate may only be considered after a 6-week recovery period has elapsed following a pacemaker implantation to allow for recovery and stabilization.

(b) A period of one week recovery must elapse after the pacemaker box change before applying for recertification.

(c) For all other major pacemaker upgrades, a six-week recovery period after the intervention is required before applying for recertification.

(d) A Bi-ventricular pacing shall be assessed and evaluated on a case-by-case basis.

(e) An applicant or holder of a medical must not have other medical disqualifying conditions and coexisting pathology, or other congenital

abnormalities are likely to disbar an applicant from obtaining an aviation medical license.

(f) Acceptable pacemaker is a bipolar lead system with a battery life of a minimum of 12 months.

1.4 Disqualifying conditions

(a) An applicant or holder of a medical certificate fitted with a unipolar system.

(b) An applicant or holder of a medical certificate who is pacemaker dependent. (Pacemaker dependency is defined by a heart rate of <30bpm with the pacemaker system inactivated and the Fall-back rate of <50bpm)

1.5 Initial Medical Requirements

(a) An applicant or holder of a medical certificate shall be required to submit the following:

(i) a Cardiology assessment report;

(ii) a Pacemaker interrogation report;

(iii) an Exercise ECG – an applicant or holder of a medical certificate must reach Bruce stage 4 with no significant abnormality of rhythm or conduction, nor evidence of myocardial ischaemia shall be demonstrated and withdrawal of cardioactive medication prior to the test must be considered;

(iv) a 24-hour ECG - shall demonstrate no significant rhythm or conduction disturbance; and

(v) an Echocardiogram – showing no significant selective chamber enlargement or significant structural or functional abnormality and a left ventricular ejection fraction of at least 50%.

1.6 Follow-up – minimum 6 monthly checks (reported annually)

(a) An applicant or holder of a medical certificate shall –

(i) undergo annual aviation medical examination;

(ii) provide annual Cardiology assessment report;

(iii) provide a Stress Electrocardiogram;

(iv) provide a Echocardiogram;

(v) provide a 24-hour Holter Electrocardiogram;

(vi) provide Pacemaker interrogation report; and

(vii) provide fasting s-lipogram; fasting s-glucose; and s-U&E.

SCHEDULE 60: PROTOCOL ON CONGENITAL HEART DISEASE

1.1 Applicability

(a) This protocol is applicable to an applicant or a holder of Class 1, 2, 3 and 4 medical certificates.

1.2 Initial Medical Requirements

(a) An applicant or a holder of a medical certificate shall provide the following:

(i) a Cardiologist report;

(i) a cardiothoracic surgeon's report; and

(ii) an Echocardiogram.

1.3 Follow-up Reports

(a) An applicant or holder of a medical certificate shall be assessed on a case-by-case basis.

SCHEDULE 61: PROTOCOL ON GENDER DYSPHORIA (GENDER TRANSFORMATION)

1.1 Applicability

(a) This protocol applies to an applicant or a holder of Class 1, 2, 3 and 4 medical certificates.

1.2 General Initial medical requirements

(a) All gender transformation cases shall be submitted to the AMC for consideration.

(b) An Endocrinologist or treating physician report shall be required to determine the medical fitness status of an applicant or a holder of a medical certificate.

(c) An applicant or holder of a medical certificate had successfully completed the gender reassignment surgery and hormone therapy after a period 5 years or more than 5 years, and if there is no evidence of mental health diagnosis, an applicant or holder of the medical certificate may be declared medically fit.

(d) An applicant or holder of a medical certificate who meets the requirements referred to in subsection (3) may be considered medically fit pending submission of favourable reports.

(e) If an applicant or holder of a medical certificate presents with a history of a coexisting mental health concern or history of mental health treatment such as psychotherapy or medications for any condition other than Gender Dysphoria, such an applicant or holder of a medical certificate shall medically report to the Aeromedical Committee to determine his or her medical fitness.

(f) An applicant or a holder of a medical certificate shall not have evidence of a mental health diagnosis and shall submit a clinical psychologist report with a completed Gender Dysphoria Mental Health Status Report using World Professional Association for Transgender Health guidelines

1.3 Requirements for an applicant or holder of the medical certificate with hormonal treatment or medical surgery performed in less than 5 years

(a) An applicant or holder of a medical certificate shall submit a comprehensive endocrinologist or treating physician report.

(b) If a medical surgery has been performed, a status report from the surgeon or current treating physician showing full release, of any sedation or pain medication, and free of any surgical complications.

(c) If an applicant or a holder of a medical certificate is receiving hormone therapy, a current status report describing the length of time on the medication and side effects, if any.

(d) If an applicant or holder of a medical certificate had surgery performed within a year, a status medical report from the surgeon or current treating physician (Endocrinologist) showing full release, of any sedation or pain medication, and any surgical complications such as DVT/PE/Cardiac.

(e) An applicant shall be required to submit a Clinical Psychologist: Completed the Gender Dysphoria Mental Health Status Report using World Professional Association for Transgender Health guidelines; (Suggested also for treatment less than 5 years).

(f) A holder or applicant or holder of a medical certificate shall submit the following blood results:

(i) Full Blood Count, as patients present with Erythropoiesis, which is common when long-acting testosterone esters are very high in older men and smokers; and

(ii) A male applicant or male holder of a medical certificate shall maintain his Hematocrit at less than 50%.

(g) An applicant or holder of a medical certificate presenting high haematocrit associated with overall mortality, cardiovascular mortality, contributes to hypercoagulability and the risk of Thromboembolic, Cerebrovascular Accidents and ACS. In the case of high haematocrit levels, treatment that falls in lieu with the SA DAMES guidelines.

(h) Lipogram shall be required as testosterone decreases High-Density

Lipoprotein (HDL), the decrease may occur in total cholesterol, low-density lipoprotein (LDL) and High-density Lipoprotein HDL.

SCHEDULE 62: PROTOCOL ON PHAEOCHROMOCYTOMA

1.1 APPLICABILITY

(a) This protocol applies to applicants or holders of Class 1, 2, 3, and 4 medical certificates.

1.2 GENERAL INITIAL MEDICAL REQUIREMENTS

(a) An Applicant or holder of a medical certificate who is medically unfit on diagnosis, shall submit all medical reports to the Medical Assessor for consideration by a panel of experts.

(b) An applicant or holder may be considered, following successful surgery, for recertification after 3-6 months; and

(c) An applicant or holder shall submit the following reports:

(i) Computed Tomography Scan or Magnetic Resonance Imagine,

(ii) Full Blood Count (FBC);

(iii) Urea and Creatinine (U&E); and

(iv) Plasma test that is conducted twice, or a 24-hour Urine Fractionated Metanephrines test.

(d) Certification may be considered if physically and biochemically normal and blood pressure is well controlled.

(e) An applicant or holder shall submit an annual Endocrinologist or specialist physician report, which shall include the following:

(i) the patient's symptoms;

(ii) blood pressure;

(iii) medications with side effects, and

(iv) whether syndromic causes such as MEN2 (Multiple endocrine neoplasia type 2), multifocal disease, or metastases were excluded.

(f) An Echocardiogram and ECG will be required and if either Electrocardiography (ECG) or Echocardiogram is abnormal, a cardiology report will be required.

(g) If any visual symptoms are present, an Ophthalmology report is required.

1.3 Follow-up reports

(a) An applicant or a holder shall submit an annual Endocrinologist or Specialist Physician report, which shall include -

(i) patient's symptoms;

(iii) blood pressure;

(iv) medications with side effects; and

(v) whether syndromic causes such as MEN2, multifocal disease, or metastases are present.

(b) If the echocardiogram or ECG was initially abnormal, a yearly follow-up of these tests and a cardiology report will be necessary, including –

(i) Full Blood Count (FBC);

(ii) Urea & Creatine (U&E); and

(iii) Plasma Test must be repeated twice or 24h Urine Fractionated Metanephrines must be submitted yearly.

SCHEDULE 63 – PROTOCOL ON GROWTH HORMONE EXCESS

1.1 APPLICABILITY

(a) This protocol applies to an applicant or a holder of Class 1, 2, 3, or 4 medical certificates.

2.1 GENERAL INITIAL MEDICAL REQUIREMENTS

(a) Applicant or holder of Class 1, 2, 3 or 4 medical certificate shall be declared medically unfit on diagnosis.

(b) An applicant or holder of a medical certificate shall submit an Endocrinology report to the Medical Assessor for consideration by the AMC.

(c) The Endocrinology report shall include comments on complications of the acromegaly, the presence of hypopituitarism, medications prescribed and any side effects if present.

(d) An applicant or holder of a medical certificate shall submit the following results of investigations Bloods:

(i) Urea and Creatinine (U& E);

(ii) Full Blood Count (FBC);

(iii) Liver Function Test (LFT);

(iv) IGF-1; GH (+- GH suppression test);

(v) Glycated Haemoglobin (HbA1C);

(vi) Thyroid Function Test (TFT);

(vii) Cortisol, ACTH and Prolactin; conducted at 8h00am;

(viii) Testosterone or oestradiol conducted at 8h00am;

(ix) Luteinizing Hormone (LH);

(x) Follicle Stimulating Hormone (FSH); and

(xi) Magnetic Resonance Imaging (MRI) of Pituitary Fossa.

(e) If neurosurgery is planned or has been performed, a full Neurosurgery report should be submitted, including details about complications and any residual tumour present.

(f) After neurosurgery, an applicant or holder of a medical certificate will be withdrawn for a minimum period of 6 to 12 months.

(g) An applicant or holder of a medical certificate shall submit an Ophthalmologist report, including formal visual fields.

(h) An applicant or holder shall submit a Cardiology report which shall include the following:

(i) Stress ECG;

(ii) Echocardiogram; and

(iii) Holter ECG.

(i) It is estimated that sleep apnoea occurrence in patients with acromegaly is approximately 40 to 50%, therefore the applicant or holder of a medical certificate must undergo screening for obstructive sleep apnoea according to formal sleep studies.

(j) An applicant or holder of a medical certificate must submit a colonoscopy to exclude colon polyps and colon cancer.

(k) An applicant or holder of a medical certificate shall submit a Clinical psychologist report that includes the following:

(i) psychopathologies, including depression;

(ii) anxiety; and

(iii) affective disorders that are common in patients with acromegaly.

1.2 FOLLOW-UP REPORTS

(a) An applicant or a holder of a medical certificate is required to submit an Endocrinology report to the Medical Assessor for consideration by a panel of experts.

(b) The reports must include comments on complications of the acromegaly, hypopituitarism, medications prescribed and any side-effects if present, and long-term treatment plan.

(c) An applicant or a holder will be required to submit yearly blood results of investigations:

(i) Urea and Creatinine (U& E);
(ii) Full Blood Count (FBC);
(iii) Liver Function Test (LFT);
(iv) IGF-1; GH (+- GH suppression test);
(v) Glycated Haemoglobin (HbA1C);
(vi) Thyroid Function Test (TFT);
(vii) Cortisol, ACTH and prolactin conducted at 8h00am;
(viii) Testosterone or oestradiol conducted at 8h00am;
(ix) Luteinizing Hormone (LH);
(x) Follicle Stimulating Hormone (FSH);and
(xi) MRI of the pituitary fossa (initially yearly; later every 2-3 years).

(j) An applicant or a holder of a medical certificate must submit an Ophthalmologist report, including formal visual fields, yearly, unless there is -

(i) no residual tumour present, and
(ii) no initial eye involvement.

(k) If abnormal findings were reported on the initial Cardiology report, or the acromegaly is still active, a yearly follow-up report from a Cardiologist shall be submitted.

(l) If there are no abnormal findings detected on the cardiology report, a report shall be submitted every 5 years.

(m) Colonoscopy shall be performed every –

(i) Five years in those found to have a polyp on initial colonoscopy or those with persistently elevated IGF-1 levels, and

(iii) Ten years in those without polyps and with normal IGF-1 levels.

(n) If the initial screening for obstructive sleep apnoea was positive, a yearly report on response to therapy is required.

(o) A follow-up clinical psychologist report is required to be submitted if any psychopathology was present on initial screening.

SCHEDULE 64 - CORTISOL EXCESS (CUSHING'S SYNDROME)

1.1 APPLICABILITY

(a) This protocol applies to an applicant or a holder of Class 1, 2, 3, and 4 medical certificates.

1.2 GENERAL INITIAL MEDICAL REQUIREMENTS

(a) An applicant or a holder of a medical certificate shall be assessed medically unfit on diagnosis and shall be grounded until hormone secretion returns to normal.

(b) An applicant or holder shall submit an Endocrinologist report to the Medical Assessor for consideration by the panel of experts, which shall include –

(i) comments on complications of the cortisol excess including comments on weakness and proximal muscle wasting;

(ii) Bone mineral density;
(iii) Diabetes;
(iv) Hypertension;
(v) Obesity or BMI, Venous thromboembolism (VTE); and

(vi) Aetiology of the disease, medications prescribed and any side-effects if present, and long-term treatment plan.

(c) If surgery is planned or has been performed –

(i) A full Neurosurgery report submitted, only if the surgery relates to a pituitary tumour;

(ii) A full Surgery report is required, only if the surgery relates to adrenal or ectopic tumour; and

(iii) Full details are required about complications, cure, long-term treatment plan, and any residual tumour present.

(d) After neurosurgery, an applicant or a holder medical certificate with a history of Adrenal Tumour shall be withdrawn for a minimum period of 6 – 12 months post-surgery.

(e) An applicant or a holder medical certificate shall submit results of diagnostic tests performed, including –

(i) A 24h urine cortisol levels;

(ii) ACTH;

(iii) Midnight serum/salivary cortisol;

(iv) Dexamethasone suppression tests;

(v) Intravenous Pyelogram (IVP);

(vi) Imaging Report, e.g. pituitary MRI, abdominal CT-scan;

(vii) Urea and Creatine (U&E);

(viii) Full Blood Count (FBC)

(ix) Lipogram; and

(x) Glycated Haemoglobin HbA1C.

(f) A Clinical psychologist report is required to monitor the neuropsychologic symptoms of patients which shall include –

(i) Insomnia;

(ii) Depression;
(iii) memory loss; and
(iv) psychosis.

(g) An Ophthalmology report is required, including evaluation for increased intraocular pressure, cataracts, and central serous chorioretinopathy.

(h) A Cardiology report is required, including a stress ECG and Echocardiogram.

(i) A screening for obstructive sleep apnoea in accordance with formal sleep studies is required if there is a positive screening questionnaire such as the Epworth Sleepiness Scale, the STOP-Bang questionnaire.

1.3 FOLLOW-UP REQUIREMENTS

(a) An applicant or a holder shall submit an Endocrinologist report to the Medical Assessor for consideration by the panel of experts, which shall include comments on the following:

(i) complications of past cortisol excess such as HT, DM, and osteoporosis;

(ii) current BMI;
(iii) whether a disease is cured or in remission;
(iv) medications prescribed and any side-effects if present; and

(v) long-term treatment plan.

(b) An applicant or a holder medical certificate shall submit a yearly U&E, HbA1C, lipogram.

(c) An applicant or a holder shall submit an annual -
(i) follow-up Clinical Psychologist report; and

(ii) ophthalmology report if initial evaluation abnormal.

(d) If abnormal findings were reported on the initial Cardiology report, or the disease is still active, a yearly follow-up report from a Cardiologist shall be submitted.

(e) If there are no abnormal findings detected on the initial Cardiology report, a report will be required every 5 years.

SCHEDULE 65 – PROTOCOL ON DIABETES INSIPIDUS

1.1 APPLICABILITY

(a) This protocol applies to an applicant or a holder of Class 1, 2, 3 and 4 medical certificates.

1.2 GENERAL INITIAL MEDICAL REQUIREMENTS

(a) An applicant or a holder shall be declared unfit on diagnosis for at least 3 months, or until stable according to the medical report from the specialist.

(b) An applicant or a holder shall submit an Endocrinologist report to the Medical Assessor for consideration by the panel of experts, shall contain the following information:

(i) diagnostic tests performed;

(ii) current symptoms;

(iii) cause of the diabetes insipidus, if found; or

(iv) any medications used and side-effects experienced.

(c) An applicant or a holder of a medical certificate shall submit a U&E, and results of diagnostic tests or imaging performed.

1.3 FOLLOW- UP REQUIREMENTS

(a) An applicant or a holder of a medical certificate shall submit a yearly U&E.

(b) An applicant or a holder of a medical certificate shall submit a yearly Endocrinologist or treating Specialist Physician report which states whether –

(i) the condition is well-controlled;

(ii) the treatment is well tolerated; and

(iii) the applicant is compliant on therapy.";

(h) the substitution in Technical Standard 67.00.4 section 3.5 subsection (2) for paragraph (b) of the following subparagraph:

"(b) *Basis for termination or non-renewal of designation*

Termination or non-renewal of designation may be based, in whole or in part, on the following criteria:

(i) failure to **[re-register]** apply timeously for re-designation **[punctually]** each year;

(ii) no examinations performed during the 12 months of initial designation by a designated junior aviation medical examiner, DAME, DSAME, and for designated junior aviation medical examiner, DAME, and foreign DAME;

(iii) performing less than **[15]** 10 examinations per year after 24 months for DSAME. This figure shall be **[30]** 15 examinations per year for **[D-SAMEs**] DSAME;

(iv) disregard of, or failure to demonstrate knowledge of, the rules, regulations, policies and procedures of a Medical Assessor;

(v) repeated errors after receiving warnings from a Medical Assessor;

(vi) failure to attend required conferences **[and/or]** or continued aviation medical education coordinated by the Authority;

(vii) movement of the location of practice from where presently designated unless approved by the Director;

[(viii) failure to participate in any aviation medical programme when requested to do so by [the designated body or institution or] the Director];

(ix) unprofessional conduct in performing examinations;

(x) failure to comply with the provisions of Part 67 of the CAR;

(xi) personal conduct or public notoriety that may reflect adversely **[on the designated body or institution or]** to the Director;

(xii) loss, restriction or limitation of a licence to practice medicine;

(xiii) any action that compromises public trust or interferes with the DAME's ability to fulfil the responsibilities of his or her designation;

(xiv) any illness or medical condition that may affect the physician's sound professional judgment or ability to perform examinations;

(xv) arrest, indictment or conviction for violation of law;

(xvi) request by the physician for termination of designation; or

(xvii) any other reason if it is determined to be in the best interest of aviation safety as determined by the Director.";

(i) the insertion in technical standard 67.00.4 after section 5 of the following section:

"**5A. Designation of Cabin Crew First Aid Instructor**

1.1 Requirements as a First Aid Examiner

(a) The requirements for a First Aid Examiner shall be –

(i) proof of current registration as –

(aa) medical doctor registered with the Health Professions Council of South Africa;

(bb) auxiliary nurse registered with the Nursing Council of South Africa;

(cc) advanced life support paramedic emergency care practitioner with level 7 or 8 registered with the Health Professions Council of South Africa;

(dd) intermediate life support emergency care practitioner with Level 6;

(ee) basic life support emergency care practitioner with BAA-Level 4-5, registered with the Health Professions Council of South Africa; or

(ff) proof of continued professional development with the institutions referred to in items (aa) to (ee);

(ii) Instructor, Train-the-Trainer OR Facilitator accredited by the relevant authority;

(iii) primary aviation health or flight medical attendant Course or Aviation Health Care Provider Course;

(iv) attendance of recognized facilitator course or instructor course or train-the-trainer course or educational courses as part of either under or post-graduate professional Bachelor's degree or equivalent course registered with an accredited authority;

(v) basic life support instructor certificate approved by the Health Professions Council of South Africa;

(vi) documented proof of experience in the aviation environment; and

(vii) affiliation to an ATO.

1.2 Requirements for designation as a First Aid Examiner

(a) An applicant, who desires to be designated as a First Aid Examiner, shall apply to the Director.

(b) An application for the designation as a First Aid Examiner shall be accompanied by proof that an applicant complies with the conditions, requirements, and standards prescribed in these technical standards.

(c) The Director may, after due consideration of an application, designate an applicant as a designated First Aid Examiner for the period determined, which period may not exceed one year, calculated from the date of the designation.

(d) An applicant who desires to renew his or her designated First Aid Examiner shall submit the following to the Director within 60 days preceding the date of expiry –

(i) application form; and

(ii) the appropriate fee as prescribed in Part 187.

1.3 Conditions for designated First Aid Examiner

(a) A First Aid Examiner shall ensure that the original or certified copy for each test conducted, is retained by an ATO for a minimum period of 5 years, such documentation shall be assessed during all inspections.

(b) A First Aid Examiner shall ensure that he or she has knowledge of current CAR, TS, and AICs.

(c) A First Aid Examiner shall sign relevant segments of an applicant's certificate where and when required, indicating the date and nature of the test.

(d) A First Aid Examiner is responsible for moderating 30% of training provided by First Aid Instructor.

(e) A First Aid Examiner shall produce documented proof of currency with the relevant professional authority he or she is registered with.

(f) A First Aid Examiner shall submit a quarterly report to the Director, on all theory and practical tests conducted.

(g) The Director may request further supporting documents such as training schedules, lesson plans, and training manuals.

(h) In the event of a failure, the test forms shall indicate notes on the de-briefing done and a candidate shall append his or her initials next to such notes.

(j) A First Aid Examiner shall have a stamp made that reflects the name and designation reference number of a First Aid Examiner.

(k) A maximum of 12 learners per First Aid Instructor/DE are allowed for all practical training sessions.

1.4 Training aids and equipment required

(a) The following training aids and equipment are required during training:

(i) a CPR adult, child, and infant manikin is to be available for all courses presented at a ratio of 3 learners per manikin minimum;

(ii) each learner shall be issued with a pair of medical examination gloves and rescue aid way valve mouth-to-mouth device or a pocket mask; and

(iii) a medical or patient oxygen cylinder device shall be required for training.

1.5 Oversight of First Aid Examiner

(a) The following types of inspections shall be conducted by an authorised officer on each First Aid Examiner within 12 months:

(i) an inspection for annual renewal of a First Aid Examiner status, which inspection shall entail the following:

(aa) an assessment of training compliance to Part 64; and

(bb) an assessment of compliance to conditions of designation and training equipment.

(ii) *ad hoc* inspections for the maintenance of standards.

(b) If it becomes evident that a First Aid Examiner is not maintaining the required standard of testing, the Director may at any time request such a First Aid Examiner to undergo a theoretical and practical assessment.

1.6 Designation of First Aid Instructor

Requirements as a First Aid Instructor

(a) The requirements for designation shall be –

(i) proof of current registration as –

(aa) medical doctor registered with the Health Professions Council of South Africa;

(bb) auxiliary nurse registered with the South African Nursing Council;

(cc) advanced life support paramedic with Level 7 or 8, registered with the Health Professions Council of South Africa;

(dd) intermediate life support emergency care practitioner with Level 6;

(ee) basic life support emergency care practitioner with BAA-Level 4-5, registered with the Health Professions Council of South Africa; or

(ff) proof of continued professional development with the institutions referred to in items (aa) to (ee);

(gg) Instructor, Train-the-Trainer or Facilitator accredited by the relevant authority;

(hh) primary aviation health, Flight Medical Attendant Course or Aviation Health Care Provider Course;

(ii) Basic Life Support Instructor Certificate approved by the professional authority;

(jj) assessor Course that is South African Qualification Authority approved;

(kk) documented proof of experience in the aviation environment; and

(ll) affiliation with an ATO.

1.7 Requirements for designation of First Aid Instructor

(a) A person, who desires to be designated as a First Aid Instructor, shall apply to the Director.

(b) The Director may, after due consideration of the application, designate an applicant as a First Aid Instructor. For the period determined, which period may not exceed one year, calculated from the date of the designation.

(c) The Director may withdraw a designation if it becomes evident that the designated instructor does not comply with the provisions of these Technical Standards.

(d) A designated First Aid Instructor shall upon the withdrawal of the designation by the Director, forthwith surrender all documents issued by the Director.

1.8 Conditions for First Aid Designated Instructor

(a) A First Aid Instructor shall have knowledge of the current CAR, TS, and AICs.

(b) A First Aid Instructor shall sign appropriate segments of the applicant's certificate where and when required indicating the date and nature of the test.

(c) A First Aid Instructor shall be moderated by a First Aid Examiner.

(d) A First Aid Instructor shall submit quarterly reports to the Director, on all practical and theoretical tests conducted by a First Aid Instructor.

(e) A First Aid Instructor shall be required to produce documented proof of currency with relevant professional authority.

(f) The Director may request further supporting documents such as training schedules, lesson plans, and training manuals.

(g) A First Aid Instructor shall have a stamp made that reflects the name and designation number of a First Aid Instructor.

1.9 Oversight of First Aid Instructor

(a) The following types of inspections shall be conducted by an authorised officer on each First Aid Instructor within a 12-month period:

(i) an inspection for an annual renewal of a First Aid Instructor status, which inspection shall entail an –

(aa) assessment of training compliance to Part 67;

(bb) assessment of compliance to conditions of designation and training equipment.

(ii) *ad hoc* inspection for the maintenance of standards.

(b) If it became evident that a First Aid Instructor is not maintaining the required standard of testing, the Director may at any time request a First Aid Instructor to undergo a theoretical and practical assessment.";

(j) the substitution in technical standard 67.00.9 for the table with the following table:

“TABLE A1 MEDICATION LIST GUIDELINES			
CENTRAL NERVOUS SYSTEM			
Central nervous system stimulants: All pharmacological in this group are unacceptable. The disease condition per se does preclude aviation-related activity.			
Name	**Acceptable**	**Unacceptable**	**Comments**
Benzodiazepines	Temazepam	-	No flying within 72 hours; this drug is addictive and shall not be used with alcohol at the same time
Other	Zopiclone Zolpidem Zaleplon	-	Applicants must wait 24-48 hours after these medications have been taken before flying. These drugs must not be used more than twice a week to avoid habituation
Food supplement	-	Melatonin (not generally recommended for flight crew and cabin crew)	If considered, it shall be given a ‘ground trial’ during a period when the crew member will not be engaged in flying duties and any unwanted side effects can be assessed.

SSRI	Fluoxetine	-	Selected non-sedating selective serotonin reuptake inhibitors (SSRI) require a minimum of three (3) months grounding period. The Authority will evaluate affected applicants on a case-by case basis and will issue medical certificates based on medical findings, refer to the protocol
	Sertraline		
	Citalopram, or		
	Escitalopram		
	Paroxetine		
	Vortioxetine		
SNRI	Venlafaxine		
	Desvenlafaxine		
	Duloxetine		
	Levomilnacipran		
Barbiturates	-	These agents are unacceptable	-
Anxiolytics	-	These agents are unacceptable	-
Anti-psychotics	-	These agents are unacceptable	-
Anti-epileptics	-	These agents are unacceptable to Pilots & ATC	These medications may be considered for cabin crew, case-case presentation. A 3-month stabilisation period is required. Refer to Protocol.
		Including Gabapentin which is used for conditions other than epilepsy	

Anti-Parkinson agents	-	These agents are unacceptable	-
Anti-vertigo and anti-emetics	-	These agents are unacceptable	-
Anti-migraine agents	-	Maxalt	The underlying condition is disqualifying. The Authority shall evaluate affected applicants on a case–by–case basis and will issue medical certificates based on the medical findings.
		Triptans	An applicant using these medications may not fly for 24 hours after being treated with these medications. Beta-blockers may be considered acceptable for prophylaxis. Refer to Protocol
Alzheimer's disease	-	These agents are unacceptable	-
Anaesthetics	Acceptable	-	A minimum of 24 hours following local or regional (including dental)

			anaesthetics. (The condition for which the anaesthetic has been administered must also be considered prior to returning an individual to flying or controlling duties).
-	-	-	A minimum of 72 hours following general, spinal or epidural anaesthetic. This prescription includes drug-induced sedation. (The condition for which the anaesthetic has been administered must also be considered prior to returning an individual to flying or controlling duties).
ANALGESICS & ANTI-INFLAMMATORIES			
-	**Acceptable**	**Unacceptable**	**Comment**
Central Nervous System	-	Morphine	Central-acting, analgesics and narcotics /opioid, analgesics are
		Codeine	
		Codethyline	
		Cocaine	

		Cannabis	strictly incompatible with flying status.
-	-	Doxylamine	-
		Promethazine	
		Meprobamate	
		Orphenadrine	
		Propoxyphene	
		Diphenhydramine	
		Tramadol	
NSAIDS Peripheral analgesics	Acetyl Salicylic Acid	-	-
Non-Selective Cox-Inhibitors	Acceptable	Unacceptable	-
Acetaminophen	Paracetamol	Sulindac	These substances, prescribed for short periods at moderate doses, may be compatible with flying status if the condition which justifies their prescription is itself compatible with flying status.
		Phenlybutazone	
Salicylates	Acetyl Salicylic Acid	-	
Propionic acid derivatives	Ibuprofen	-	
	Naproxen		
	Fenoprofen		
	Ketoprofen		
	Flurbiprofen		
	Indomethacin		
Acetic acid derivatives	Ketorolac	-	-
-	Diclofenac	-	-
	Nabumetone		
	Piroxicam	-	-

Enolic acid (Oxicam)	Meloxicam		
	Tenoxicam		
	Lornoxicam		
	Mefenamic acid		
Fenamic acid derivatives	Meclofenamic acid	-	-
	Flufenamic acid	-	-
	Tolfenamic acid	-	-
COX Inhibitors	Meloxicam	-	-
Selective COX2 inhibitors	Celecoxib	-	-
	Etoricoxib		
	Parecoxib		
MUSCULOSKELETAL AGENTS			
Anti-Gout	Allopurinol	Colchicine	This medication may be acceptable, each application shall be considered on a case-by-case basis
			Flying is prohibited while on colchicine. Stable GIT must be demonstrated after discontinuation of colchicine.
Topical agents	These agents are acceptable	-	-
Gold	-	These agents are unacceptable	-
Osteoporosis	Bisphosphonates	-	

	Alendronate		Reserved on a case-by-by case basis.
	Risedronate		
	Calcium and Vit D supplements		
	Other drugs:		
	Selective oestrogen receptor		
	Modulators		
	–Raloxifene		
	Parathyroid hormone		
	Teriparatide		
Autonomic		Sympathomimetics	All centrally acting agents are unacceptable
		Sympatholytics	
		Cholinergic	
		Anti-cholinergics	
AUTACOIDS			
Antihistamines	Ebastine		Sedating oral antihistamines is not authorised for flying personnel and is incompatible with flying status. New-generation, non-sedating oral (e.g. fexofenadine) and topical antihistamines may be acceptable.
	Loratadine		
	Desloratadine		
	Acrivastine		
	Fexofenadine		

Serotonin antagonists	-	All agents in this group are unacceptable	-
		Methysergide	
		Cyproheptadine	
		Pizotifen	
		Ondansetron	
		Grinesatron	
Neurokinin1 (NK1) Antagonists	-	All agents in this group are unacceptable	Novel class of medications that possesses unique antidepressant, anxiolytic, and antiemetic properties
		Aprepitant	
		Casopitant	
CARDIO-VASCULAR AGENTS			
Positive Inotropic Agents	Digoxin		Up to 0.25mg daily A specialist report shall be required indicating the stability of the underlying condition and there must be no side effects. Case-by-case by medical Assessor.
Anti-Arrhythmic	Amiodarone	-	Case-by-case presentation, individual medical may be considered. Side effects profile.

			Restrictions (VFR; multicrew; under supervision)
Anticoagulants	Rivaroxaban Dabigatran Eliquis Warfarin	-	A specialist report is required. The underlying condition shall be assessed on a case-by-case basis and no side effects. Refer to Warfarin protocol
ANTI-HYPERTENSIVES			
Central-acting sympathetic nervous system inhibitors	-	All agents in this group are unacceptable	-
Alpha-receptor blockers	Tamsulosin - e.g. Tamsul	All other agents in this group are unacceptable	All L.U.T.S cases - cases presentation, individual medication may be considered.
			An applicant on Tamsulosin shall be monitored for postural hypotension with every medical as per underlying

			condition protocol requirements
Beta-receptor blockers	Atenolol Metoprolol Bisoprolol Carvedilol	Non-selective drugs are unacceptable	Cardio-selective beta blockers are acceptable, but no longer the first line of choice.
Sympathetic nervous blockers	-	These drugs are unacceptable as they may impair alertness.	-
Direct-acting vasodilators	-	Dihydralazine Prazosin -Urapidil	These drugs are unacceptable because they frequently have adverse side effects such as orthostatic hypotension.
Calcium channel blockers	Diltiazem Verapamil Nicardipine Nitrendipine Long-acting Nifedipine	Short-acting Nifedipines are unacceptable.	These medications may be compatible with flying status. They may induce peripheral oedema or headache, but they are generally well tolerated. Preference shall be given to medications with the most flexible use. If used for angina these medications

			are not compatible with flying status.
ACE inhibitors	Captopril	-	-
	Enalapril		
	Lisinopril		
	Benazepril		
	Fosinopril		
	Perindopril		
	Quinapril		
	Ramipril		
Angiotensin receptor antagonists	Candesartan	-	-
	Eprosartan		
	Irbesartan		
	Losartan		
	Telmisartan		
	Valsartan		
Anti-anginal agent	-	-	Angina pectoris per se is disqualifying.
Diuretics	Hydrochlorothiazide (< 25 mg/day)	Bumetanide	Low-dose diuretics are acceptable. Furosemide must go with potassium supplement
	Furosemide (up to 40mg daily)		
	Potassium/ magnesium sparing diuretics such as amiloride and spironolactone	Torasemide	High dose kaliuretic diuretics (> 25 mg hydrochlorothiazide or equivalent) are unacceptable.
		Acetazolamide	
		Eplerenone	

Other vasodilators	-	-	The indications for use are disqualifying.
Vasoconstrictors	-	-	The indications for use are disqualifying.
HYPOLIPIDAEMIC AGENTS			
Dyslipidaemia in flying personnel shall be treated in conjunction with an appropriate diet and weight reduction if appropriate.			
Fibrates	-	-	Treatment with fibric acids (e.g. fenofibrate or gemfibrozil) shall be discontinued in the case of gastrointestinal side effects or elevated transaminase concentration
Statins	-		HMG-CoA reductase inhibitors are acceptable with preference for hydrophilic molecules such as pravastatin rather than lipophilic substances such as simvastatin which may induce sleep disorders.
	Atorvastatin Lovastatin Fluvastatin Ezetimibe Pravastatin Rusovastatin Simvastatin		

Omega-3-acid ethyl esters Nicotin Acid Fibric Acid Adenosine Triphosphate-Citrate Lyase (ACL)	Omega-3-acid ethyl ester Icopent ethyl Niacin Fenofibrate (Antara, Tricor, Triglide, Trilipix) Gemfibrozil Bempedoic acid		
Others	Acipimox (niacin derivative) used in low doses and accepted on a case-by-case basis.	-	-
-			
Plasma expanders	-	All agents in this group are unacceptable	-
Blood and Haemopoeitic	Anticoagulants – Warfarin – refer to the protocol-acceptable	Haemostatics, the indications for use are disqualifying	-

Fibrinolytics	-	All agents in this group are unacceptable	-
Haematological agents **inhibitors, Injectables**	Disprin/Aspirin in low-dose (≤150mg/day) acceptable		-
Sclerosing	-	All agents in this group are unacceptable	-
Haematinics	Prophylactics in pregnancy are acceptable	-	Anaemia must be corrected before consideration.
Haemoglobin-based Oxygen carrier	-	This medication is not considered	-
RESPIRATORY SYSTEM			
Coughs and cold	Drugs containing only carbocysteine, guaifenesin or acetyl cysteine without an alcohol base are accepted	Tripolidine Pseudoephedrine Ephedrine Codeine & modified Theophylline Dextromethorphan Diphenhydramine Promethazine Noscapine Phenyltoloxamine Methadone	-

Bronchodilators	Spiriva	-	Sympathomimetics: The use of Short-acting Beta Agonists (SABA) /Long-acting Beta Agonists (LABA) shall be restricted to eight (8) hours or more prior to flying, but may be used in an unusual asthmatic attack in flight to allow the safe completion of the flight.
Methylxanthines and combinations	-	All agents in this group are unacceptable	-
Anticholinergic	-	All other agents in this group are unacceptable	-
Combinations	Only acceptable combinations are Salmeterol with Fluticasone and Budesonide and Formoterol.	-	-
Mucolytics	Carbocysteine	-	-
	Acetylcysteine		
	Bromhexidine		

Anti-asthmatics	Inhaled Glucocorticoids	-	-
	Leucotrine receptor antagonists		
Chromones	Cromolyn sodium	-	The drugs are also called cromoglycates. They are alternative choices when initiating regular controller therapy in patients with mild asthma, although inhaled corticosteroids (ICS) are the preferred agents. They have the advantage of having a lower side effect profile than ICS.
	Nedocromil sodium		
Other anti-asthmatics	-	All agents in this group are unacceptable	-
Surfactants	-	This medication is not compatible with flying.	-
EAR, NOSE AND THROAT			
Topical nasal preparations	These medications are acceptable.	-	-

Ear drops and ointments	These medications are acceptable.	-	-
Mouth and Throat preparations	These medications are acceptable.	-	-
GASTRO-INTESTINAL TRACT			
Digestants	These medications are acceptable.	-	-
Appetite suppressants	-	All agents in this group are unacceptable	-
Anti-spasmodics	Mebeverine	Hyoscine	Antimuscarinics (e.g. dicyclomicine, mepenzolate, pipenzolate, poldine and propentheline) are used to reduce smooth muscle spasm in non-ulcerative dyspepsia, irritable bowel syndrome and diverticular disease.
	Alverine	Diphenhidramine	
	Peppermint Oil	Alcohol substrates	They all have atropine-like side-effects of confusion, dry mouth, reduced power of accommodation, difficulty with micturition and
		Belladonna	
		Chlordiazepoxide	
		Propentheline	
		Methixene	

			constipation, which preclude their use.
ACID REDUCERS			
Antacids	-	Magnesium as a single drug is unacceptable.	-
Antacids and combinations	-	Dicyclomine	-
		Magnesium dominant drugs	
		Oxethazaine	
H2 receptor antagonists	Cimetidine allowable if taken more than 8 hours before aviation activity.	-	-
	Ranitidine allowable if taken more than 12 hours before aviation activity		
Proton pump inhibitors	Omeprazole	-	-
Cycloprotective	-	Misoprostol	-
-			
Motility enhancers	-	All agents in this group are unacceptable	-
Laxatives	-	Magnesium salts	-
Antidiarrheal	Loperamide not to be taken less than 6 hours before aviation activity.	Codeine phosphate	-
		Co phenotrope	
		Morphine	

		Atropine (Lomotil) Aminopentamide	
Liver, gall bladder and bile	-	These agents are unacceptable due to disease profile	Treatment for the dissolution of gallstones is not compatible with flying status as it may cause diarrhoea and cholecystitis.
Suppositories and anal ointments	These agents are acceptable	-	Soothing preparations containing bismuth subgallate, zinc oxide and haemamelis often mixed with a small dose of corticosteroid may be acceptable in short courses for topical application.
Others	Sulfasalazine enteric coated may be used with 6 monthly ophthalmology reporting, FBC, UKE, and urinalysis	Sibutramine Budesonide Infliximab Orlistat	-
Anti-inflammatory	Mesalazine	Humira Salofalk	Case-by case presentation, individual

agents for Bowel Disease	Asacol: (5-aminosalicylic acid)		medication may be considered
			Sulfasalazine enteric coated may be used with 6 monthly ophthalmology reporting, FBC, UKE. and urinalysis
			The use of sulfasalazine in inflammatory bowel disease has declined due mainly to the fact that it yields the metabolite sulfapyridine which gives rise to side-effects such as agranulocytosis and hypospermia. However, the other metabolite of sulfasalazine, 5-aminosalicylic acid (5-ASA) is credited with causing the drug's therapeutic effect. Therefore, 5-ASA and other derivatives of 5-ASA, are now

			usually preferred and given alone (as mesalazine), despite their increased cost, due to their more favourable side-effect profile.
			Sulfasalazine, and its metabolite 5-ASA, are poorly absorbed from the small intestine. Its main mode of action is therefore believed to be inside the intestine. Approximately one third of a dose of sulfasalazine is absorbed from the small intestine. The remaining two thirds pass into the colon where it is split by bacteria into 5-ASA and SP. SP is well absorbed from the colon (estimated bioavailability 60%); 5-ASA is less well absorbed (estimated

			bioavailability 10% to 30%)
ANTIHELMINTICS			
Anti-helmintics	Mebendazole	Piperazine	-
	Albendazole		
	Praziquantel		
DERMATOLOGICAL			
Anti-bacterial antiseptic agents	These medications are acceptable.	-	-
Anti-parasitics	These medications are acceptable.	-	-
Fungicides	These medications are acceptable.	-	-
Cortico-steroids	These medications are acceptable.	-	-
Psoriasis	-	Systemic Etretinate	Systemic etretinate for psoriasis may cause serious drying of the skin and mucosa and particularly of the conjunctival tissues, intensified by flying conditions. It is not recommended for aircrew.
		Acitretin	
Acne		Tretinoin	
		Cyproterone acetate	
		Minocycline	

Melanin inhibitors and stimulants	-	These medications are unacceptable	-
Emollients and Protectives	These medications are acceptable	-	-
Others	-	Imiquimod	-
		Minoxidil	
OPHTHALMICS			
Aviation activities only to commence once all visual normality is regained			
Anti-infective	Chloramphenicol		Anti-infective and anti-inflammatory eye preparations are not compatible with flying status due to the underlying condition. The Authority must be consulted if there is any doubt.
	Ciprofloxacin		
	Ofloxacin		
	Oxytetracycline		
	Fusidic Acid		
	Moxyfloxacin		
Antiviral	Acyclovir		
Nonsteroidal anti-inflammatories (NSAIDS)	Kelopt Acular 0.4%		
Steroidai inflammatories:	Fluorometholone, Predforte, Maxidex		

Antibiotic-steroid drops: **Other Eye Drops**	Maxitrol Tobradex Vuity Salagen Rhopressa		
2nd Generation Histamine-H1 receptor antagonist eye drops	Alcaftadine (Lastacaft) Azelastine (Optivar) Bepotastine (Bepreve) Cetirizine (Zerviate) Ketotifen (Alaway; Zaditor) Olopatadine (Pataday; Patanol; Pazeo)		Sedative anti-histamines not acceptable
Corticoids	These medications are acceptable	-	-
Combinations	-	All treatments containing Aminoglycosides are unacceptable	-
Decongestants	-	These medications are unacceptable.	-
Mydriatics	-	These agents are unacceptable	-

Glaucoma	Beta-Blocker (Timolol) Alpha2 Agonist (brimonidine) Carbon Anhydrase Inhibitor (Trusopt) Prostaglandin (Xalatan) Oral meds (Diamox) Rho Kinase Inhibitor	Cycloplegics (atropine) Cholinergic Agonist (pilocarpine)	Contraindications: - Hypersensitivity to timolol or any of the excipients. - Heart failure, unless adequately controlled, sinus bradycardia (<45 - 50 bpm) or heart block. - Cardiogenic shock - History of bronchospasm and bronchial asthma/ Chronic obstructive pulmonary disease. - Pregnancy
Others	-	Injectables Verteporfin	-
URINARY SYSTEM			

Anti-diuretics	-	This medication is not compatible with flying	-
Urinary alkalinizes	-	The chronic use of this medication is not compatible with flying	-
Urinary antiseptics	Tamsulosin	Pipemidic acid Nalidixic acid Lanthanum Flavoxate	-
Prostate Medication	Tamsulosin Alfuzosin Tasdiam Finasteride Dutasteride	Lanthanum Flavoxate	Selective Alpha Blockers after 2 weeks grounding period and 5 Alpha-Reductase Enzyme Inhibitors after 48 hours of grounding period
GENITAL SYSTEM			
Contraceptives	These medications are acceptable	-	-
Vaginal Preparations	These medications are acceptable	-	-
Oxytocics	-	These agents are unacceptable	-
Uterine antispasmodics	-	These agents are unacceptable	-
Sexual dysfunction	-	-	Temporary colour vision disturbances

			have been reported after the use of phosphodiesterase-type-5 inhibitors (e.g. vardenafil, sildenafil). 72 hours shall elapse after use before flying.
ANTI-MICROBIALS			
Anti-Microbials	Beta-lactams,	Telithromycin	All antibiotics shall be used for 48 hours without any side effects before commencing aviation activities. Injectables are not acceptable.
	Erythromycin(short course)	Roxithromycin	
	Azithromycin (short course)	Aminoglycosides	
	Other Macrolides,		
	Chloramphenicols		
	Sulphonamides and combinations		
	Quinolones		
	Clindamycin(short course)		
	Na-Fusidate		
	Fosfomycin		
	Doxycycline		
Anti-viral agents	Acyclovir	-	Anti-retroviral to be considered on a case-by-case basis
ANTI-FUNGAL AGENTS			
	Fluconazole	-	-

Anti-fungal agents	Itraconazole		
	Nystatin		
	Terbinafine		
	Griseofulvin		
	Ketoconazole		
ANTI-PROTOZOA AGENTS			
Anti-protozoa agents	Metronidazole	Pirimethamine	-
	Atovaquone	Tinidazole	
	Chloroquine	Halofantrine	
		Mefloquine	
ANTI-RETROVIRAL AGENTS			
Nucleoside Reverse Transcriptase Inhibitors (NRTIs)	Zidovudine	Efavirenz	Initially monthly FBC for 6 months
	Retrovir		
	Lamivudine		
	Didanosine		
	Abacavir		
	Emtricitabine		
	Tenofovir		
Non-Nucleoside Reverse Transcriptase Inhibitors	Nevirapine	-	Initially ALT & AST – 2 weeks, 6 weeks
Protease Inhibitors (PI)	Atazanavir	Indinavir	-
	Lopinavir/Ritonavir		
	Saquinavir		
	Nelfinavir		
Others	Raltegravir	Tipranavir	-

	Darunavir		
	Etravirine		
	Maraviroc		
	Amprenavir		
-	Fosamprenavir	-	-
Fusion Inhibitors	Fuzeon	-	-
MALARIA MEDICATIONS			
	Mefloquine (Lariam)		Mefloquine (Lariam) is associated with adverse neuropsychiatric side effects, even weeks after the drug is discontinued. Use of mefloquine must be discontinued for at least 4 weeks before consideration. Aviation personnel must contact the SACAA or their DAME before resuming aviation duties.

			For a return to pilot duties, there must be no history of neurologic or psychiatric symptoms during and or after mefloquine use
VITAMINS, TONICS, MINERALS AND ELECTROLYTES			
Vitamins	These agents are acceptable.	-	Pilots, cabin crew, and ATC shall not exceed the Recommended Daily Allowances for these products.
Tonics	-	Alcohol-based combinations are unacceptable	-
Minerals and electrolytes	These agents are acceptable	-	Pilots, cabin crew, and ATC shall not exceed the Recommended Daily Allowances for these products.
Amino-Acids	These agents are acceptable	-	Pilots, cabin crew, and ATCs shall not exceed the Recommended Daily Allowances for these products
CYTOSTATICS			
Immunological	-	-	-
Immunosuppressant's			
Immunostimulants			
CHELATING AGENTS, ION EXCHANGE PREPARATIONS			
Chelating agents, Ion exchange	-	These agents are unacceptable	-

Preparations			
BIOLOGICAL			
Biological	Immunisation regimens are acceptable	-	No aviation-related duties for 24 hours after receiving the following vaccinations (primary and boosters):
			Adult diphtheria and tetanus
			Poliomyelitis
			Hepatitis A & B
			Measles, mumps, rubella
			Yellow fever
			Typhoid
			Tuberculosis (Mantoux Test or Bacille Calmette-Guerin);
			Influenza
			Varicella
			Meningococcal
			Pneumococcal
			Cholera.
			After receiving the following immunisations (primary and boosters) there shall be no aviation-related duties for a minimum of 72 hours: Japanese Encephalitis.
Biologics	-	Revellex	-
		Humira	
ENZYMES			
Enzymes	-	These agents are unacceptable	-
POISON ANTIDOTES			
Poison Antidotes	-	Bupropion is unacceptable	-
OTHERS			

Others	Nicotine adjuvants are acceptable	Bupropion is unacceptable	-
Biological	Immunisation regimens are acceptable -	-	No aviation-related duties for 24 hours after receiving the following vaccinations (primary and boosters): Adult diphtheria and tetanus Poliomyelitis Hepatitis A & B Measles, mumps, rubella Yellow fever Typhoid Tuberculosis (Mantoux Test or Bacille Calmette-Guerin); Influenza Varicella Meningococcal Pneumococcal Cholera. After receiving the following immunisations (primary and boosters) there shall be no aviation-related duties for a minimum of 72 hours: Japanese Encephalitis.
	COVID-19 Vaccines: Not compulsory		(a) Aviation personnel who receive a COVID-19 vaccine may not participate in aviation-related duties for 48 hours multicrew and 72 hours on single pilot after receiving the COVID-19 vaccine.

			(b) People with immunocompromising conditions (such as, but not limited to HIV/Aids, Diabetes Mellitus, Lymphomas/Other Cancers) or people who take immunosuppressive medications or therapies might be at increased risk for severe COVID-19 side effects. Currently there is no data available to establish COVID-19 vaccine safety and efficacy in these groups. Research currently indicates that current COVID-19 vaccines are not live vaccines and can be used by personnel with immunocompromising conditions or people who take immunosuppressive medication. Aviation personnel presenting with immunocompromising conditions or who take immunosuppressive medications or therapies must consult with the treating specialist to get guidance on the appropriate COVID-19 vaccine.

AMENDMENT OF SA-CATS 91

6. Document SA-CATS 91 is hereby amended by the substitution of Technical Standard 91.07.33 of the following Technical Standard:

"**91.07.33 OPERATIONS WITH HEAD-UP DISPLAYS, ENHANCED VISION SYSTEMS OR NIGHT VISION IMAGING SYSTEM**

Note 1: TGM HUD and Equivalent Displays is available on the SACAA website
Note 2: "Vision systems" is a generic term referring to the existing systems designed to provide images, that is: EVS, SVS and CVS, NVIS.

(1) A pilot may not use an ALS, HUD, EVS or NVIS in flight in IMC unless such pilot has received the training and checking specified in this TS.

(2) An owner or an air service operator may permit anyone to use a ALS, HUD, EVS or NVIS in flight under IFR in an aircraft so equipped unless the aircraft has been approved for such flight as specified in this TS.

(3) Head-up displays

(a) HUD may be used for the following purposes:

(b) to supplement conventional flight deck instrumentation in the performance of a particular task or operation. The primary flight deck instruments remain the primary means for manually controlling or manoeuvring the aircraft; and

(c) as a primary flight display –

(i) information presented by the HUD may be used by a pilot in lieu of scanning head-down displays. Operational approval of a HUD for such use allows a pilot to control the aircraft by reference to the HUD for approved ground or flight operations; and

(ii) information presented by the HUD may be used as a means to achieve additional navigation or control performance. Operational credits, in the form of lower minima, for HUD used for this purpose may be approved for a particular aircraft or automatic flight control system. Additional credit may also be allowed to conduct operations with HUD in situations where automated systems are otherwise used.

(d) An owner or an air service operator who has been approved to use a HUD may—

(i) operate with reduced visibility or reduced RVR; or

(ii) replace the guidance of certain ground facilities such as touchdown zone or centre line lights

(e) The functions of a HUD may be provided by a suitable equivalent display: Provided that the appropriate airworthiness approval has been obtained for such a display.

(f) Ground training in the use of the HUD shall be accomplished at an approved training organisation (ATO) or as part of an approved training programme. The programme shall include, as a minimum, the following:

(i) an understanding of the HUD and symbology.

(ii) HUD limitations and normal procedures, including maintenance and operational checks performed to ensure normal system function prior to use;

(iii) failure modes of the HUD and the impact of the failure modes or limitations upon crew performance;

(iii) consideration of the potential for loss of situational awareness due to “tunnel vision”, also known as cognitive tunnelling or attention tunnelling;

(iv) any effects that weather such as low ceilings and visibilities, may have on the performance of a HUD; and

(v) all flight operations for which the HUD or equivalent display is used.

(g) 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 –

(i) pilot seat adjustment to attain and maintain appropriate viewing angles and verification of HUD operating modes;

(ii) operations during critical flight events such as ACAS TA/RA, upset and wind shear recovery, engine or system failure;

(h) 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;

(i) 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

(j) use during tow 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.

(4) Enhanced Vision Systems

(a) Enhanced vision systems can display electronic real-time images of the actual external scene achieved through the use of image sensors such as EVS, SVS, CVS, and NVIS or display synthetic images, which are derived from the onboard avionics systems.

(b) The information from vision systems may be displayed head-up or head-down. Such a system may display electronic real-time images of the external scene using the EVS component of the system.

(c) Operational credit may be granted to appropriately qualified vision systems.

(d) 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.

(e) The use of EVS shall –

(i) allow aa pilot to view an image of the external scene obscured by darkness or other visibility restrictions;

(ii) 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;

(iii) improve situational awareness;

(iv) enable pilots to detect obstructions on or adjacent to the runway

or taxiways, terrain and other aircraft on the ground;

(v) provide visual cues to enable earlier runway alignment and a more stabilised approach; and

(vi) may qualify for operational credit to use reduced visibility minima if the information from the vision system is suitably presented to a pilot and the necessary airworthiness approval and specific approval from the Director has been obtained for the combined system.

(f) An owner or an air service 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:

(i) an understanding of the system characteristics and operational constraints;

(ii) normal procedures, controls, modes and system adjustments;

(iii) EVS limitations;

(iv) failure modes of the EVS and the impact of the failure modes or limitations upon crew performance, in particular, for two-pilot operations; and

(v) any effects that weather, such as low ceilings and visibilities, may have on the performance of an EVS.

(g) An owner or an air service operator who wishes to use EVS in an 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 –

(i) 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;

(ii) crew co-ordination and monitoring procedures and pilot call-out responsibilities;

(iii) the transition from enhanced imagery to visual conditions during the runway visual acquisition; and

(vi) rejected landing due to loss of visual cues of the landing area, touchdown zone or rollout area.

(5) HUD, EVS and NVIS approvals

(a) For operations with an ALS, HUD or an equivalent display, EVS, CVS or NVIS the following requirements shall be met:

(i) an air service operator shall obtain operational and airworthiness-specific approval to use these systems;

(ii) 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; and

(iii) installations in aircraft in the State of Manufacture shall meet the airworthiness requirements of such State. An owner or an air

service operator can submit evidence of meeting the requirements of the State of Manufacture airworthiness approval for the use of the applicable system. This approval shall be deemed acceptable towards the specific approval by the Authority.

(b) Prior to installing a system, as a retrofit, an owner or air service operator shall contact the Authority to determine the airworthiness requirements associated with its approval for use.

(c) ALS, HUD, EVS, CVS and NVIS require the following specific approvals:

(i) operational and airworthiness-specific approvals are required if the equipment is to be used to lower an owner or the air service operator's aerodrome operating minima;

(ii) an airworthiness approval issued to an air service operator for an aircraft shall be valid for any other aircraft of the same type operated by such operator provided the relevant equipment is the same in each aircraft;

(iii) an airworthiness approval issued to an aircraft type may be extended to other aircraft types provided the Authority is of the opinion that the other aircraft types have sufficient commonality with the approved aircraft and the relevant equipment, as applicable;

(iv) operational approval to use the applicable systems shall be issued by the Authority to the applicant upon presentation of the certificate issued by the ATO. Such approval is pilot-specific;

(v) 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.

(vi) The following items shall be covered in a vision systems compliance list:

(aa) reference documents used in compiling the submission for approval;
(bb) flight manual;
(cc) feedback and reporting of significant problems;
(dd) requested operational credit and resulting aerodrome operating minima;
(ee) MEL and standard operating procedures;
(ff) safety risk assessment and management of change;
(gg) certificate of completed training from an approved ATO; and
(hh) continuing airworthiness.

Note 1: Operational credit includes –

a. *For the purpose of an approach ban, a 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.*

Note 2: More detailed information and guidance on automatic landing systems, HUD or equivalent displays, EVS, SVS, CVS and NVIS is contained in an AIC for all-weather operations.

(d) A pilot shall pass a knowledge test following the ground training and a skills test following the flight training, both of which shall be administered by an air service operator or an authorised person. Upon successful completion of the skills test, an air service operator or crew member shall record the qualification to operate with an ALS, HUD, EVS, CVS or NVIS, as applicable, in his or her training records.

(e) Annual recurrent training in the use of the applicable systems shall be accomplished.

(f) The standard operating procedures for these systems shall be specified.

(g) For operations with aeroplanes equipped with automatic landing systems, an HUD and equivalent displays, EVS, SVS or CVS, the classifications of instrument approach procedure shall not be affected.".

AMENDMENT OF SA-CATS 93

7. Document SA-CATS 93 is hereby amended by:

(a) the substitution in Technical Standard 93.07.13 section 6 for subsection (3) of the following subsection:

"(3) An aeroplane of an MCM of over 27000 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2024, shall autonomously transmit information from which a position can be determined at least once every minute, when in distress.";

(b) the insertion in technical standard 93.07.13 after subsection (3) of the following subsection:

"(3A) An aircraft of an MCM of over 5700 kg up to 27000kg for which the individual certificate of airworthiness is first issued on or after 1 January 2023, shall autonomously transmit information from which a position can be determined at least once every minute, when in distress.";

(c) the substitution of technical standard 93.07.23 of the following technical standard:

"**93.07.23 OPERATIONS WITH HEAD-UP DISPLAYS, ENHANCED VISION SYSTEMS OR NIGHT VISION IMAGING SYSTEMS**

Note: TGM HUD and Equivalent Displays is available on the SACAA website

1. Introduction

(1) This TS provides guidance for the approval for use of automatic landing systems (ALS), head-up displays (HUD), equivalent displays and enhanced vision systems (EVS) including night vision imaging systems (NVIS) intended for installation and operational use in aircraft engaged in corporate aviation. HUD and EVS may be installed separately or together as part of a hybrid system. 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. Use of these systems during instrument flight and any operational credit gained from their use requires approval from the Authority.

Note: "Vision systems" is a generic term referring to the existing systems designed to provide images, i.e. EVS, SVS and CVS, NVIS.

(2) A pilot may not use an ALS, HUD, EVS or NVIS in flight in IMC unless such pilot has received the training and checking specified in this TS.

(3) A CAO may not permit anyone to use an ALS, HUD, EVS or NVIS 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 for the following purposes:

(a) to supplement conventional flight deck instrumentation in the performance of a particular task or operation. The primary flight deck instruments remain the primary means for manually controlling or manoeuvring the aircraft; and

(b) as a primary flight display –

(i) information presented by the HUD may be used by a pilot in lieu of scanning head-down displays. Operational approval of a HUD for such use allows the pilot to control the aircraft by reference to the HUD for approved ground or flight operations; and

(ii) information presented by the HUD may be used as a means to achieve additional navigation or control performance. Operational credits, in the form of lower minima, for HUD used for this purpose may be approved for a particular aircraft or automatic flight control system. Additional credit may also be allowed to conduct operations with HUD in situations where automated systems are otherwise used.

(2) A CAO 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 an HUD shall be accomplished at an approved training organisation (ATO) or as part of an approved training programme. The programme shall include, as a minimum, the following:

(a) an understanding of an HUD and symbiology.

(b) HUD limitations and normal procedures, including maintenance

and operational checks performed to ensure normal system function prior to use;

(c) failure modes of an HUD and the impact of the failure modes or limitations upon crew performance;

(d) consideration of the potential for loss of situational awareness due to “tunnel vision” (also known as cognitive tunnelling or attention tunnelling);

(e) any effects that weather, such as low ceilings and visibilities, may have on the performance of an HUD; and

(f) All flight operations for which an 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 such as ACAS TA/RA, upset and wind shear recovery, engine or system failure;

(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 a pilot flying the aircraft and either head-up or head-down monitoring by the other pilot; and

(e) use during tow 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. Enhanced Vision systems

(1) Enhanced vision systems can display electronic real-time images of the actual external scene achieved through the use of image sensors such as EVS, SVS, CVS, and NVIS or display synthetic images, which are derived from the onboard avionics systems.

(2) The information from vision systems may be displayed head-up or head-down. Such a system may display electronic real-time images of the external scene using the EVS component of the system.

(3) Operational credit may be granted to appropriately qualified vision systems.

(4) 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.

(4) The use of EVS –

(a) shall allow a pilot to view an image of the external scene obscured by darkness or other visibility restrictions;

(b) shall allow the 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) improve situational awareness;

(d) shall enable pilots to detect obstructions on or adjacent to the runway or taxiways, terrain and other aircraft on the ground;

(e) provide visual cues to enable earlier runway alignment and a more stabilised approach; and

(f) may qualify for operational credit to use reduced visibility minima 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 Director has been obtained for the combined system;

(6) For a CAO 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.

(7) For a CAO 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 the following:

(a) enhanced vision display/s 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) the 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, EVS and NVIS approvals

(1) For operations with an ALS, HUD or an equivalent display, EVS, CVS or NVIS the following requirements shall be met:

(a) an air service operator shall obtain operational and airworthiness-specific approval to use these systems;

(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) installations in aircraft in the State of Manufacture shall meet the airworthiness requirements of such State. An owner or an air service operator must submit evidence of meeting the requirements of the State of Manufacture airworthiness approval for the use of the applicable system. This approval shall be deemed acceptable towards the specific approval by the Authority.

(d) prior to installing a system, as a retrofit, an owner or an air service operator shall contact the Authority to determine the airworthiness requirements associated with its approval for use.

(2) ALS, HUD, EVS, CVS and NVIS specific approvals-

(a) operational and airworthiness-specific approvals are required if the equipment is to be used to lower the owner or an air service operator's aerodrome operating minima;

(b) an airworthiness approval issued to an air service operator for an aircraft shall be valid for any other aircraft of the same type operated by such operator provided the relevant equipment is the same in each aircraft;

(c) an airworthiness approval issued to an aircraft type may be extended to other aircraft types provided the Authority is of the opinion that the other aircraft types have sufficient commonality

with the approved aircraft and the relevant equipment, as applicable;

(d) operational approval to use the applicable systems shall be issued by the Authority to an applicant upon presentation of the certificate issued by an ATO. Such approval is pilot-specific;

(e) 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:

(i) reference documents used in compiling the submission for approval;
(ii) flight manual;
(iii) feedback and reporting of significant problems;
(iv) requested operational credit and resulting aerodrome operating minima;
(v) MEL and standard operating procedures;
(vi) safety risk assessment and management of change;
(vii) certificate of completed training from an approved ATO; and
(viii) continuing airworthiness.

Note: Operational credit includes –

(a) For the purpose of an approach ban, a 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.

Note 2: More detailed information and guidance on automatic landing systems, HUD or equivalent displays, EVS, SVS, CVS and NVIS is contained in an AIC for All-

Weather Operations.

(3) A pilot 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 or crew member shall record the qualification to operate with an ALS, HUD, EVS, CVS or NVIS, as applicable, in his or her training records.

(4) Annual recurrent training for the use of the applicable system shall be accomplished.

(5) The standard operating procedures for these systems shall be specified.

(6) For operations with aeroplanes equipped with automatic landing systems, HUD and equivalent displays, EVS, SVS or CVS, the classifications of instrument approach procedure shall not be affected.".

AMENDMENT OF SA-CATS 121

8. Document SA-CATS 121 is hereby amended by:

(a) the insertion in technical standard 121.02.13 section 1 after the definition "local day" of the following definition:

"**local night**" means a period of eight (8) hours falling between 22h00 and 08h00 local time in terms of flight duty periods;";

(b) the substitution in technical standard 121.02.13 of sections 2 and 3 of the following section:

"**2. Maximum flight time**

(1) The total flight time of the sectors on which an individual flight crew

member is assigned as an operating crew member shall not exceed the following:

(a) 40 hours of flight time during the preceding seven days;

(b) 100 hours of flight time during the preceding 30 days; and

(c) 1,000 hours of flight time during the preceding 365 days.

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

(3) A flight crew member is required to inform an air service operator of all flying hours he or she has undertaken if the cumulative amount of such flying and any scheduled duties is likely to exceed the maximum times specified in the Regulations and as provided for in this Document SA CATS 121.

(4) Hours flown outside the scope of an AOC for no remuneration or compensation shall not be subject to flight duty period limitations as provided for in this Document SA-CATS 121.

(5) It is the responsibility of a crew member to ensure that he or she is adequately rested, to manage his or her cumulative fatigue and to remain within the prescribed maximum allowed flight times.

3. Air Service Operator Scheme and Approval

(1) An operator shall submit a proposed scheme for the regulation of flight time and duty periods and minimum rest periods, in accordance with Technical Standard 121.02.13, to the Director for approval, with the aim of ensuring that a crew member is performing at an adequate level of alertness.

(2) Any less restrictive deviation from the approved scheme shall be submitted to the Director for approval and this submission shall be based on relevant scientific data to support the proposed scheme.

(3) An air service operator who establishes a scheme for the regulation of flight time and duty periods in accordance with Technical Standard

121.02.13 shall establish and submit to the Director for approval, a fatigue risk management system for the purpose of managing fatigue, in accordance with Technical Standard 121.02.14.

(4) Post-flight duty shall count as duty period.

(5) An air service operator shall specify post-flight duty times in its Operations Manual, taking into account the type of operation, the size and type of aircraft and the airport conditions.";

(c) the insertion in Technical Standard 121.07.13 section 5 after subsection (5) of the following subsection**:**

"**(6) Family assistance plan**

(a) An air service operator shall develop and implement a family assistance plan and shall regularly review such a family assistance plan when necessary.

(b) the family assistance implementation plan shall consist of the following.

(i) recipients of family assistance;

(ii) when family assistance should be provided;

(iii) family assistance providers;

(iv) periodic review and exercise of the family assistance plan; and

(v) policies necessary to implement the family assistance plan.";

(d) by the substitution and insertion in Technical Standard 121.07.13 of section 6 for subsection (3) of the following subsections:

"(3) An aeroplane of an MCM of over 27000 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2024, shall autonomously transmit information from which a position can be determined at least once every minute, when in distress.

(3A) An aeroplane of an MCM of over 5700 kg up to 27000kg for which the individual certificate of airworthiness is first issued on or after 1 January 2023, should autonomously transmit information from which a position can be determined at least once every minute, when in distress.";

(e) the substitution of technical standard 121.07.31 of the following technical standard:

"***121.07.31:*** **OPERATIONS WITH HEAD-UP DISPLAYS, ENHANCED VISION SYSTEMS OR NIGHT VISION IMAGING SYSTEMS**

Note: TGM HUD and Equivalent Displays is available on the SACAA website

1. Introduction

(1) This TS provides guidance for the approval for the use of automatic landing systems (ALS), head-up displays (HUD), equivalent displays and enhanced vision systems (EVS) including night vision imaging systems (NVIS) intended for installation and operational use in aircraft engaged in commercial operations. HUD and EVS may be installed separately or together as part of a hybrid system. 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. Use of these systems during instrument flight and any operational credit gained from their use requires approval from the Authority.

Note: "Vision systems" is a generic term referring to the existing systems designed to provide images, i.e. EVS, SVS, CVS, and NVIS.

(2) A pilot may not use an ALS, HUD, EVS or NVIS in flight in IMC unless such pilot has received the training and checking specified in this TS.

(3) An AOC may not permit anyone to use an ALS, HUD, EVS or NVIS 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 for the following purposes:

(a) to supplement conventional flight deck instrumentation in the performance of a particular task or operation. The primary flight deck instruments remain the primary means for manually controlling or manoeuvring the aircraft; and

(b) as a primary flight display –

(i) information presented by the HUD may be used by the pilot in lieu of scanning head-down displays. Operational approval of a HUD for such use allows the pilot to control the aircraft by reference to the HUD for approved ground or flight operations; and

(ii) information presented by the HUD may be used as a means to achieve additional navigation or control performance. Operational credits, in the form of lower minima, for HUD used for this purpose may be approved for a particular aircraft or automatic flight control system. Additional credit may also be allowed to conduct operations with HUD in situations where automated systems are otherwise used.

(2) An air service operator who has been approved to use a 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 a HUD shall be accomplished at an approved training organisation (ATO) or as part of an approved training programme. The programme shall include, as a minimum, the following:

(a) an understanding of a HUD and symbiology;
(b) HUD limitations and normal procedures, including maintenance and operational checks performed to ensure normal system function prior to use;
(c) failure modes of a HUD and the impact of the failure modes or limitations upon crew performance;
(d) consideration of the potential for loss of situational awareness due to "tunnel vision" (also known as cognitive tunnelling or attention tunnelling);
(e) any effects that weather, such as low ceilings and visibilities, may have on the performance of a HUD; and
(f) all flight operations for which a 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 a 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 a HUD operating modes;
(b) operations during critical flight events such as ACAS TA/RA, upset and wind shear recovery, engine or system failure;
(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 a HUD;
(d) crew co-ordination, monitoring and verbal call-out procedures for a dual HUD installation with the use of a HUD by the pilot flying the aircraft and either head-up or head-down monitoring by the other pilot; and

(e) use during tow 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. Enhanced Vision Systems

(1) EVS can display electronic real-time images of the actual external scene achieved through the use of image sensors such as EVS, SVS, CVS, NVIS, NVG or display synthetic images, which are derived from the onboard avionics systems.

(2) The information from vision systems may be displayed head-up or head-down. Such a system may display electronic real-time images of the external scene using the EVS component of the system.

(3) Operational credit may be granted to vision systems which are appropriately qualified.

(4) 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.

(5) The use of EVS –

(a) shall allow a pilot to view an image of the external scene obscured by darkness or other visibility restrictions;

(b) shall allow the 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) improve situational awareness;

(d) shall enable a pilot to detect obstructions on or adjacent to the runway or taxiways, terrain and other aircraft on the ground;

(e) provide visual cues to enable earlier runway alignment and a more stabilised approach; and

(f) may qualify for operational credit to use reduced visibility minima 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 Director has been obtained for the combined system; and

(g) for an air service 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:

(i) an understanding of the system characteristics and operational constraints;

(ii) normal procedures, controls, modes and system adjustments;

(iii) EVS limitations;

(iv) failure modes of the EVS and the impact of the failure modes or limitations upon crew performance, in particular, for two-pilot operations; and

(v) any effects that weather, such as low ceilings and visibilities, may have on the performance of an EVS.

(6) For an air service 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 an 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 the following:

(a) enhanced vision displays 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, EVS and NVIS approvals

(1) For operations with an ALS, HUD or an equivalent display, EVS, CVS or NVIS the following requirements shall be met:

(a) an air service operator shall obtain operational and airworthiness-specific approval to use these systems;

(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) installations in aircraft in the State of Manufacture shall meet the airworthiness requirements of such State. An air service operator can submit evidence of meeting the requirements of the State of Manufacture airworthiness approval for the use of the applicable system. This approval shall be deemed acceptable towards the specific approval by the Authority;

(d) prior to installing a system, as a retrofit, an air service operator shall contact the authority to determine the airworthiness requirements associated with its approval for use.

(2) ALS, HUD, EVS, CVS and NVIS requires the following specific approvals:

(a) operational and airworthiness-specific approvals are required if the equipment is to be used to lower the air service operator's aerodrome operating minima;

(b) an airworthiness approval issued to an air service operator for an aircraft shall be valid for any other aircraft of the same type operated by such operator provided the relevant equipment is the same in each aircraft;

(c) an airworthiness approval issued to an aircraft type may be extended to other aircraft types provided the Authority is of the opinion that the other aircraft types have sufficient commonality with the approved aircraft and the relevant equipment, as applicable;

(d) operational approval to use the applicable systems shall be issued by the Authority to the applicant upon presentation of the certificate issued by the ATO. Such approval is pilot-specific;

(e) 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:

(i) reference documents used in compiling the submission for approval;

(ii) flight manual;

(iii) feedback and reporting of significant problems;

(iv) requested operational credit and resulting aerodrome operating minima;

(v) MEL and standard operating procedures;

(vi) safety risk assessment and management of change;

(vii) certificate of completed training from an approved ATO; and

(viii) continuing airworthiness.

Note 1: Operational credit includes –

(a) For the purpose of an approach ban, a 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.*

Note 2: More detailed information and guidance on automatic landing systems, HUD or equivalent displays, EVS, SVS, CVS and NVIS is contained in an AIC for All-Weather Operations.

(3) A pilot 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 or crew member shall record the qualification to operate with an ALS, HUD, EVS, CVS or NVIS, as applicable, in his or her training records.

(4) Annual recurrent training in the use of the applicable system/s shall be accomplished.

(5) The standard operating procedures for these systems shall be specified.

(6) 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.".

AMENDMENT OF SA-CATS 135

9. Document SA-CATS 135 is hereby amended by:

(a) the substitution in technical standard 135.02.9 for section 1 of the following section:

"**1. General**

(1) 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) Definitions:

"**local night**" means a period of eight (8) hours falling between 22h00 and 08h00 local time in terms of flight duty periods;";

(b) substitution in Technical Standard 135.07.13 section 6 for subsection (2) of the

following subsection:

"(2) An aeroplane of an MCM of over 27000 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2024, shall autonomously transmit information from which a position can be determined at least once every minute, when in distress.

(2A) An aeroplane of an MCM of over 5700 kg up to 27000kg for which the individual certificate of airworthiness is first issued on or after 1 January 2023, shall autonomously transmit information from which a position can be determined at least once every minute, when in distress.";

(c) the substitution of Technical Standard 135.07.29 of the following Technical Standard:

"**135.07.29: OPERATIONS WITH HEAD-UP DISPLAYS, ENHANCED VISION SYSTEMS OR NIGHT VISION IMAGING SYSTEMS**

Note: TGM HUD and Equivalent Displays is available on the SACAA website

1. Introduction

(1) This TS provides guidance for the approval of the use of automatic landing systems (ALS), head-up displays (HUD), equivalent displays and enhanced vision systems (EVS) including night vision imaging systems (NVIS) intended for installation and operational use in aircraft engaged in corporate aviation. HUD and EVS may be installed separately or together as part of a hybrid system. 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. Use of these systems during instrument flight and any operational credit gained from their use requires approval from the Authority.

Note: "Vision systems" is a generic term referring to the existing systems designed to provide images, i.e. EVS, SVS CVS, and NVIS.

(2) A pilot may not use an ALS, HUD, EVS or NVIS in flight in IMC unless such pilot has received the training and checking specified in this TS.

(3) An air service operator may permit anyone to use an ALS, HUD, EVS or NVIS 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) A HUD may be used for the following purposes:

(a) to supplement conventional flight deck instrumentation in the performance of a particular task or operation. The primary flight deck instruments remain the primary means for manually controlling or manoeuvring the aircraft; and

(b) as a primary flight display –

(i) information presented by the HUD may be used by the pilot in lieu of scanning head-down displays. Operational approval of a HUD for such use allows the pilot to control the aircraft by reference to the HUD for approved ground or flight operations; and

(ii) information presented by a HUD may be used as a means to achieve additional navigation or control performance. Operational credits, in the form of lower minima, for a HUD used for this purpose may be approved for a particular aircraft or automatic flight control system. Additional credit may also be allowed to conduct operations with a HUD in situations where automated systems are otherwise used.

(2) An owner or an air service operator who has been approved to use a 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 a 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 a HUD shall be accomplished at an approved training organisation (ATO) or as part of an approved training programme. The programme shall include, as a minimum, the following:

(a) an understanding of a HUD and symbology;

(b) HUD limitations and normal procedures, including maintenance and operational checks performed to ensure normal system function prior to use;

(c) failure modes of a HUD and the impact of the failure modes or limitations upon crew performance;

(d) consideration of the potential for loss of situational awareness due to “tunnel vision” (also known as cognitive tunnelling or attention tunnelling);

(e) any effects that weather, such as low ceilings and visibilities, may have on the performance of a HUD; and

(f) All flight operations for which aa 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 a 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 the following:

(a) pilot seat adjustment to attain and maintain appropriate viewing angles and verification of HUD operating modes;

(b) operations during critical flight events such as ACAS TA/RA, upset and wind shear recovery, engine or system failure;

(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 a HUD;

(d) crew co-ordination, monitoring and verbal call-out procedures for a dual HUD installation with the use of a HUD by aa pilot flying an aircraft and either head-up or head-down monitoring by the other pilot; and

(e) use during tow 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. Enhanced Vision Systems

(1) EVS can display electronic real-time images of the actual external scene achieved through the use of image sensors such as EVS, SVS, CVS, and NVIS or display synthetic images, which are derived from the onboard avionics systems.

(2) 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.

(3) Operational credit may be granted to appropriately qualified vision systems.

(4) 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.

(5) The use of EVS –

(a) shall allow a 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) improve situational awareness;

(d) shall enable a pilot to detect obstructions on or adjacent to the runway or taxiways, terrain and other aircraft on the ground;

(e) provide visual cues to enable earlier runway alignment and a more stabilised approach; and

(f) may qualify for operational credit to use reduced visibility minima if the information from the vision system is presented to a pilot suitably and the necessary airworthiness approval and specific approval from the Director has been obtained for the combined system.

(6) For a CAO 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.

(7) For a CAO 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 the following:

(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, EVS and NVIS approvals

(1) For operations with an ALS, a HUD or an equivalent display, EVS, CVS or NVIS the following requirements shall be met:

(a) An air service operator shall obtain operational and airworthiness-specific approval to use these systems.

(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; and

(c) Installations in an aircraft in the State of Manufacture shall meet the airworthiness requirements of such State. An owner or air service operator can submit evidence of meeting the requirements of the State of Manufacture airworthiness approval for the use of the applicable system. This approval shall be deemed acceptable towards the specific approval by the Authority.

(d) Prior to installing a system, as a retrofit, an owner or an air service operator shall contact the SACAA to determine the airworthiness requirements associated with its approval for use.

(2) ALS, HUD, EVS, CVS and NVIS requires the following specific approvals:

(a) operational and airworthiness-specific approvals are required if the equipment is to be used to lower the owner or an air service operator's aerodrome operating minima;

(b) an airworthiness approval issued to an air service operator for an aircraft

shall be valid for any other aircraft of the same type operated by such an air service operator, provided the relevant equipment is the same in each aircraft;

(c) an airworthiness approval issued to an aircraft type may be extended to other aircraft types provided the Authority is of the opinion that the other aircraft types have sufficient commonality with the approved aircraft and the relevant equipment, as applicable;

(d) operational approval to use the applicable systems shall be issued by the Authority to the applicant upon presentation of the certificate issued by an ATO. Such approval is pilot-specific;

(e) 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 –

(i) reference documents used in compiling the submission for approval;

(ii) flight manual;

(iii) feedback and reporting of significant problems;

(iv) requested operational credit and resulting aerodrome operating minima;

(v) MEL and standard operating procedures;

(vi) safety risk assessment and management of change;

(vii) certificate of completed training from an approved ATO; and

(viii) continuing airworthiness.

Note 1: Operational credit includes –

(a) For the purpose of an approach ban, a 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.

Note 2: More detailed information and guidance on automatic landing systems, HUD or equivalent displays, EVS, SVS, CVS and NVIS is contained in an AIC for All-Weather Operations.

(3) A pilot 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 air service operator or an authorised person. Upon successful completion of the skills test, the operator or crew member shall record the qualification to operate with an ALS, HUD, EVS, CVS or NVIS, as applicable, in his or her training records.

(4) Annual recurrent training in the use of the applicable systems shall be accomplished.

(5) The standard operating procedures for these systems shall be specified.

(6) For operations with aeroplanes equipped with automatic landing systems, a HUD or equivalent displays. EVS, SVS or CVS, the classifications of instrument approach procedure shall not be affected.".

AMENDMENT OF SA-CATS 139

10. Document SA-CATS 139 is hereby amended by:

(a) the insertion after the definition of "aircraft stand" of the following definition:

"**'ascent and descent surface'** means an inclined plane or complex surface that slopes upward from the centre of the FaTo to indicate the path helicopters are expected to follow when vertical procedures are utilized and can consist of:

(a) an inverted triangle when there is no lateral component; or

(b) an inverted conical surface when there is a lateral component;";

(b) the substitution for the definition of "declared distances" of the following definition:

"**'[Declared] declared distances — heliports'** means—

(a) TODAH, the length of the FaTo plus the length of helicopter clearway or elevated helicopter clearway if provided declared available and suitable for helicopters to complete the take-off;

(b) RTODAH, the length of the FaTo declared available and suitable for helicopters operated in performance Class 1 to complete a rejected take-off; and

(c) LDAH, the length of the FaTo plus any additional area declared available and suitable for helicopters to complete the landing manoeuvre from a defined height;";

(c) the insertion after the definition of "effective Intensity" of the following definition:

"**'elevated helicopter clearway'** means a helicopter clearway that has been raised to a level that provides obstacle clearance;";

(d) the substitution for the definition of "helicopter clearway" of the following definition:

"'helicopter clearway" means a defined area **[on the ground or water, selected and prepared as a suitable area]** over which a helicopter **[operated in**

performance Class 1] may accelerate and achieve a **[specific height]** specified set of helicopter flight conditions;";

(e) the insertion after the definition of "independent parallel departures" of the following definition:

"'**Initial departure fix (IDF)'** means the terminal fix for the visual segment and the fix where the instrument phase of the PinS departure begins;";

(f) the substitution for the definition of "PinS approach" of the following definition:

"'**PinS approach'** means **[the point-in-space approach based on GNSS and is]** an approach procedure designed for helicopters only that includes both a visual and an instrument segment. **[It is also aligned with a reference point located to permit subsequent flight manoeuvring or approach and landing using visual manoeuvring in adequate visual conditions to see and avoid obstacles]**;";

(g) the insertion after the definition of "PinS approach" of the following definition:

"'**PinS departure'** means a departure procedure designed for helicopters only that includes both a visual and an instrument segment;";

(h) the insertion after the definition of "PinS departure" of the following definition:

"'**PinS reference point (PRP)'** means a reference point for the point-in-space approach as identified by the latitude and longitude of the MAPt;";

(i) the substitution for the definition of "PinS visual segment" of the following definition:

"'**PinS visual segment'** means a segment of a helicopter PinS **[approach]** procedure **[from the]** between a point (MAPt or IDF) and the heliport **[to the landing location for a PinS proceed visually" procedure. This visual segment connects the PinS to the landing location]**;";

(j) the insertion after the definition of "unserviceable area" of the following definition:

"**'Vertical procedures"** means take-off and landing procedures that include an initial vertical/steep climb and a final vertical/steep descent profile. The profile may or may not include a lateral component.

(k) the substitution for the abbreviation of "HFM" of the following abbreviation:

" 'HFM' means helicopter flight manual (also known as RFM)";

(l) the insertion after the abbreviation of "HFM" of the following abbreviation:

"**'Hz"** means hertz;";

(m) the insertion after the abbreviation of "Hz" of the following abbreviation:

"**'IDF"** means initial departure fix;";

(n) the insertion after the abbreviation of "IDF" of the following abbreviation:

"**'Kg"** means kilogram;";

(o) the insertion after the abbreviation of "MAPt" of the following abbreviation:

"**'NVIS"** mean night vision imaging systems;";

(p) the insertion after the abbreviation of "NVIS" of the following abbreviation:

"'OCS' means obstacle clearance surface;";

(q) the insertion after the abbreviation of "PinS" of the following abbreviation:

"**'PRP'** means point-in-space reference point;";

(r) the insertion after the abbreviation of "PRP" of the following abbreviation:

"**'RFF"** means rescue and firefighting;";

(s) the insertion after the abbreviation of "RFF" of the following abbreviation:

"**'RFFS'** means rescue and firefighting services;"; and

(t) the insertion after the abbreviation of "RFFS" of the following abbreviation:

"**'RFM'** means rotorcraft flight manual (also known as HFM);".

(u) the insertion after technical standard 139.02.1 of the following technical standard:

"**139.02.2 Application for licence or amendment thereof**

1. An application for an initial aerodrome certificate or licence shall be made to the Director in the appropriate prescribed form and accompanied by the following documents:

(*a*) an aerodrome manual referred to in regulation 139.02.11;

(*b*) plans of an aerodrome;

(*c*) written approval from the local government concerned;

(*d*) an environmental impact report, in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998);

(*e*) written approval from all relevant government institutions listed in Document SA-CATS 139;

(*f*) the provision of firefighting service as contemplated in regulation 139.02.15;

(*g*) particulars of non-compliance with, or deviations from—

(i) appropriate aerodrome design, operation or equipment standards prescribed in regulation 139.02.10; or

(ii) appropriate airspace classification requirements prescribed in Part 172; and

(*h*) appropriate fee as prescribed in Part 187.";

(v) the insertion after technical standard 139.02.1 for the following technical standard:

"**139.02.3 Renewal of licence**

1. An application for the renewal of an aerodrome certificate or licence shall be made to the Director in the appropriate prescribed form and accompanied by documents:

(*a*) an updated aerodrome manual referred to in regulation 139.02.11;

(*b*) proof of level of fire services to be provided;

(*c*) particulars of non-compliance with, or deviations from—

(i) appropriate aerodrome design, operation or equipment standards prescribed in this Part; or

(ii) appropriate airspace classification requirements prescribed in Part 172; and

(iii) appropriate fee as prescribed in Part 187.

(w) the insertion in technical standard 139.02.10 after section 1 of the following section:

"**2. Aeronautical data**

(1) Aerodrome mapping data shall be made available to the aeronautical information

services for aerodromes deemed relevant by the Director where safety or performance-based operations suggest possible benefits and shall be in accordance to the requirements contained in Part 175.

(2) Where made available in accordance with subsection (2), the selection of the aerodrome mapping data features to be collected shall be made with consideration of the intended applications and shall be in accordance to the requirements contained in Part 175.

(3) Digital data error detection techniques shall be used during the transmission or storage of aeronautical data and digital data sets.

3 Aerodrome reference point

(1) The aerodrome reference point shall be located near the initial or planned geometric centre of the aerodrome and shall normally remain where first established.

(2) The position of the aerodrome reference point shall be measured and reported to the aeronautical information services authority in degrees, minutes and seconds.

4 Aerodrome and runway elevations

(1) For an aerodrome used by international civil aviation for non-precision approaches, the elevation and geoid undulation of each threshold, the elevation of the runway end and any significant high and low intermediate points along the runway shall be measured to the accuracy of one-half metre and reported to the aeronautical information services.

(2) For precision approach runway, the elevation and geoid undulation of the threshold, the elevation of the runway end and the highest elevation of the touchdown zone shall be measured to the accuracy of one-quarter metre and reported to the aeronautical information services.

5 Aerodrome dimensions and related information

(1) The aerodrome dimension and related information for each aerodrome facility shall be measured or described, as appropriate, for each facility provided on an aerodrome:

(a) runway — true bearing to one-hundredth of a degree, designation number, length, width, displaced threshold location to the nearest metre, slope, surface type, type of runway and, for a precision approach runway category I, the existence of an obstacle free zone when provided;

(b) strip— runway end safety area length, width to the nearest metre or stopway, surface type; and arresting system — location (which runway end) and description;

(c) taxiway — designation, width, surface type;

(d) apron — surface type, aircraft stands;

(e) the boundaries of the air traffic control service;

(f) clearway — length to the nearest metre, ground profile;

(g) visual aids for approach procedures, marking and lighting of runways, taxiways and aprons, other visual guidance and control aids on taxiways and aprons, including taxi-holding positions and stopbars, and location and type of visual docking guidance systems;

(h) location and radio frequency of any VOR aerodrome checkpoint;

(i) location and designation of standard taxi-routes; and

(j) distances to the nearest metre of localizer and glide path elements comprising an instrument landing system (ILS) or azimuth and elevation antenna of a microwave landing system (MLS) in relation to the associated runway extremities.

(2) The geographical coordinates of each threshold shall be measured and reported to the aeronautical information services authority in degrees, minutes, seconds and hundredths of seconds.

(3) The geographical coordinates of appropriate taxiway centre line points shall be measured and reported to the aeronautical information services authority in degrees, minutes, seconds and hundredths of seconds.

(4) The geographical coordinates of each aircraft stand shall be measured and reported to the aeronautical information services authority in degrees, minutes, seconds and hundredths of seconds.

(5) The geographical coordinates of obstacles in Area 2 (the part within the aerodrome boundary) and in Area 3 shall be measured and reported to the aeronautical information services authority in degrees, minutes, seconds and tenths of seconds. In addition, the top elevation, type, marking and lighting (if any) of obstacles shall be reported to the aeronautical information services authority.

6 Strength of pavements

(a) The bearing strength of a pavement shall be determined.

(b) The bearing strength of a pavement intended for aircraft of apron (ramp) mass greater than 5 700 kg shall be made available using the aircraft classification rating-pavement classification rating (ACR-PCR) method by reporting all of the following information:

(i) pavement classification rating (PCR) and numerical value;

(ii) pavement type for ACR-PCR determination;

(iii) subgrade strength category;

(iv) maximum allowable tire pressure category or maximum allowable tire pressure value; and

(v) evaluation method.

(c) The PCR reported shall indicate that aircraft with an aircraft classification rating (ACR) equal to or less than the reported PCR may operate on the pavement subject to any limitation on the tire pressure or aircraft all-up mass for specified aircraft type(s).

(d) The ACR of an aircraft shall be determined in accordance with the standard procedures associated with the ACR-PCR method.

(e) For the purposes of determining the ACR, the behaviour of a pavement shall be classified as equivalent to a rigid or flexible construction.

(f) Information on pavement type for ACR-PCR determination, subgrade strength category, maximum allowable tire pressure category and evaluation method shall be reported using the following codes:

(i) Pavement type for ACR-PCR determination:	Code
Rigid pavement	R
Flexible pavement	F

(ii) Subgrade strength category:	Code
High strength: characterized by E = 200 MPa and representing all E values equal to or above 150 MPa, for rigid and flexible pavements.	A
Medium strength: characterized by E = 120 MPa and representing a range in E values equal to or above 100 MPa and strictly less than 150 MPa, for rigid and flexible pavements.	B
Low strength: characterized by E = 80 MPa and representing a range in E values equal to or above 60 MPa and strictly less than 100 MPa, for rigid and flexible pavements.	C
Ultra-low strength: characterized by E = 50 MPa and representing all E values strictly less than 60 MPa, for rigid and flexible pavements.	D

(iii) Maximum allowable tire pressure category:	Code
Unlimited: no pressure limit	W
High: pressure limited to 1.75 MPa	X
Medium: pressure limited to 1.25 MPa	Y
Low: pressure limited to 0.50 MPa	Z

(iv) Evaluation method:	Code

Technical evaluation: representing a specific study of the pavement characteristics and the types of aircraft which the pavement is intended to serve. Using aircraft experience: representing a knowledge of the specific type and mass of aircraft satisfactorily being supported under regular use.

7 Pre-flight altimeter check location

(1) A pre-flight check location shall be located on an apron.

(2) The elevation of a pre-flight altimeter check location shall be given as the average elevation, rounded to the nearest metre or foot, of the area on which it is located. The elevation of any portion of a pre-flight altimeter check location shall be within 3m of the average elevation for that location.

8 Runway surface conditions for use in the runway condition report.

(1) The runway surface condition shall be assessed and reported through a runway condition code (RWYCC) and a description using the following terms:

(a) compacted snow;

(b) dry;

(c) dry snow;

(d) dry snow on top of compacted snow;

(e) dry snow on top of ice;

(f) frost;

(g) ice;

(i) slush;

(j) standing water;

(k) water on top of compacted snow;

(l) wet;

(m) wet ice;

(n) wet snow;

(o) wet snow on top of compacted snow;

(p) wet snow on top of ice;

(p) chemically treated; and

(r) loose sand.

(2) Whenever an operational runway is contaminated, an assessment of the contaminant depth and coverage over each third of the runway shall be made and reported.

(3) When friction measurements are used as part of the overall runway surface assessment on compacted snow- or ice-covered surfaces, the friction measuring device shall meet the standard set or agreed by the Director.

(4) Friction measurements made on runway surface conditions with contaminants other than compacted snow and ice shall not be reported.

(5) Information that a runway or portion thereof is slippery wet shall be made available.

(6) The aerodrome operator shall notify relevant aerodrome users when the friction level of a paved runway or portion thereof is less than the minimum friction level as specified in Table 1 below.

Table 1: Friction levels for new and existing runway surfaces

Test equipment	Test tire type	Test tire pressure (KPa)	Test Speed (km/h)	Test water depth (mm)	Design objective new surface	Maintenance planning level	Minimum friction level
Mu-meter trailer	A	70	65	1.0	0,72	0,52	0,42
	A	70	95	1.0	0,66	0,38	0,26
Skiddometer Trailer	B	210	65	1.0	0,82	0,60	0,50
	B	210	95	1.0	0,74	0,47	0,34
Surface Friction Tester Vehicle	B	210	65	1.0	0,82	0,60	0,50
	B	210	95	1.0	0,74	0,47	0,34
Runway Friction Tester Vehicle	B	210	65	1.0	0,82	0,60	0,50
	B	210	95	1.0	0,74	0,54	0,41
TATRA Friction Tester Vehicle	B	210	65	1.0	0,76	0,57	0,48
	B	210	95	1.0	0,67	0,52	0,42
Grip Tester Trailer	C	140	65	1.0	0,74	0,53	0,43
	C	140	95	1.0	0,64	0,36	0,24

9 Visual approach slope indicator systems

(1) The following information concerning a visual approach slope indicator system installation shall be made available:

(a) associated runway designation number;

(b) type of system either AT-VASIS, PAPI or APAPI installation, the side of the runway on which the lights are installed, i.e. left or right, shall be given;

(c) where the axis of the system is not parallel to the runway centre line, the angle of displacement and the direction of displacement, i.e. left or right, shall be indicated; and

(d) nominal approach slope angle(s).

10 Coordination between aeronautical information services and aerodrome authorities.

(1) To ensure that aeronautical information services units obtain information to enable them to provide up-to-date pre-flight information and to meet the need for in-flight information, arrangements shall be made between aeronautical information services and aerodrome authorities responsible for aerodrome services to report to the responsible aeronautical information services unit, with a minimum of delay:

(a) information on the status of certification of aerodromes and aerodrome conditions as per Subpart 2 of these regulations and sections 8, 9, and 10.

(b) the operational status of associated facilities, services and navigation aids within their area of responsibility;

(c) any other information considered to be of operational significance.

(2) Before introducing changes to the air navigation system, due account shall be taken by the services responsible for such changes of the time needed by aeronautical

information services for the preparation, production and issue of relevant material for promulgation.

(3) To ensure timely provision of the information to aeronautical information services, close coordination between those services concerned is therefore required.

(4) Of a particular importance are changes to aeronautical information that affect charts and/or computer-based navigation systems which qualify to be notified by the aeronautical information regulation and control (AIRAC) system.

(5) The predetermined, internationally agreed AIRAC effective dates shall be observed by the responsible aerodrome services when submitting the raw data to aeronautical information services.

11 Disabled aircraft removal

(1) The telephone numbers of the office of the aerodrome coordinator of operations for the removal of an aircraft disabled on or adjacent to the movement area shall be made available, on request, to aircraft operators.

(2) Information concerning the capability to remove an aircraft disabled on or adjacent to the movement area shall be made available.

12 Rescue and firefighting

(1) Information concerning the level of protection provided at an aerodrome for aircraft rescue and firefighting purposes shall be made available.

(2) The level of protection normally available at an aerodrome shall be expressed in terms of the category of the rescue and firefighting services in accordance with the types and amounts of extinguishing agents normally available at the aerodrome shall be as per Table 2 (Classification matrix).

(3) Changes in the level of protection normally available at an aerodrome for rescue and firefighting shall be notified to the appropriate air traffic services units and aeronautical information services units to enable those units to provide the necessary information

to arriving and departing aircraft. When such a change has been corrected, the above units shall be advised accordingly.

(4) A change shall be expressed in terms of the new category of the rescue and firefighting service available at the aerodrome:

Table 2: Classification matrix

Column I	**Column II**	**Column III**	**Column IV**
Aerodrome Category	**Aircraft Overall Length**	**Aircraft Maximum Fuselage Width**	**Number of firefighting Vehicles**
1.	N/A	N/A	N/A
2.	N/A	N/A	N/A
3.	N/A	N/A	N/A
4.	at least 18 m but less | than 24 m	4 m	1
5.	at least 24 m but less than 28 m	4 m	1
6.	at least 28 m but less than 39 m	5 m	2
7.	at least 39 m but less than 49 m	5 m	2
8.	at least 49 m but less than 61 m	7 m	3
9.	at least 61 m but less than 76 m	7 m	3
10.	at least 76 m but less than 90 m		3

(a) The level of protection provided at an aerodrome for rescue and firefighting shall be based on the longest aeroplanes and its fuselage width using the aerodrome.

(b) The level of protection shall be appropriate to the aerodrome category determined where the number of movements of the aeroplanes in the highest category using the aerodrome is more than 700 total movements in the busiest consecutive three months.

(c) During reduced activity, of less than 700 total movements in the busiest consecutive three months for aeroplanes in the highest category, the level of protection available shall be no less than that is needed in the highest category of the aeroplane planned to use the aerodrome.

(5) For aerodromes certified or licenced under this subpart, rescue and firefighting vehicle shall be capable of discharging its content at the required application rate as indicated in "Table 3 (Minimum usable amounts of extinguishing agents).

(6) Minimum useable amounts of extinguishing agent" below, shall be of the appropriate mixture.

	Foam meeting performance level A		Foam meeting performance level B		Foam meeting performance level C		Complementary agents	
Aerodrome category	Water (L)	Discharge rate foam solution/ minute (L)	Water (L)	Discharge rate foam solution/ minute (L)	Water (L)	Discharge rate foam solution/ minute (L)	Dry chemical powders (kg)	Discharge Rate (kg/second)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	350	350	230	230	160	160	45	2.25
2	1 000	800	670	550	460	360	90	2.25
3	1 800	1 300	1 200	900	820	630	135	2.25
4	3 600	2 600	2 400	1 800	1 700	1 100	135	2.25
5	8 100	4 500	5 400	3 000	3 900	2 200	180	2.25
6	11 800	6 000	7 900	4 000	5 800	2 900	225	2.25
7	18 200	7 900	12 100	5 300	8 800	3 800	225	2.25
8	27 300	10 800	18 200	7 200	12 800	5 100	450	4.5
9	36 400	13 500	24 300	9 000	17 100	6 300	450	4.5
10	48 200	16 600	32 300	11 200	22 800	7 900	450	4.5

Note.— The quantities of water shown in columns 2, 4 and 6 are based on the average overall length of aeroplanes in a given category.

Table 3: Minimum usable amounts of extinguishing agents

(x) the substitution in technical standard 139.02.10 section 1.1 of the following section:

"**1.1 Design**

(1) Number and orientation of runways

(a) The number and orientation of runways at an aerodrome shall be such that the usability factor of the aerodrome is not less than 95 per cent for the aeroplanes that the aerodrome is intended to serve.

(b) The siting and orientation of runways at an aerodrome shall, where possible, be such that the arrival and departure tracks minimize interference with areas approved for residential use and other noise-sensitive areas close to the aerodrome in order to avoid future noise problems.

(c) Choice of maximum permissible crosswind components: In the application of paragraph (a) above it shall be assumed that landing or take-off of aeroplanes is, in normal circumstances, precluded when the crosswind component exceeds:

(i) 37 km/h (20 kt) in the case of aeroplanes whose reference field length is 1 500 m or over, except that when poor runway braking action owing to an insufficient longitudinal coefficient of friction is experienced with some frequency, a crosswind component not exceeding 24 km/h (13 kt) should be assumed;

(ii) 24 km/h (13kt) in the case of aeroplanes whose reference field length is 1 200 m or up to but not including 1 500m; and

(iii) 19 km/h (10kt) in the case of aeroplanes whose reference field length is less than 1 200m.

(d) The selection of data to be used for the calculation of the usability factor shall be based on reliable wind distribution statistics that extend over as long a period as possible, preferably of not less than five years. The observations

used should be made at least eight times daily and spaced at equal intervals of time.

(2) Location of threshold

(a) A threshold shall normally be located at the extremity of a runway unless operational considerations justify the choice of another location.

(b) When it is necessary to displace a threshold, either permanently or temporarily, from its normal location, account shall be taken of the various factors which may have a bearing on the location of the threshold.

(c) Where this displacement is due to an unserviceable runway condition, a cleared and graded area of at least 60 m in length shall be available between the unserviceable area and the displaced threshold.

(d) Additional distance shall also be provided to meet the requirements of the runway end safety area as appropriate.

(3) Actual length of runways

(a) Primary runway

Except as provided in paragraph (c) below, runway length to be provided for a primary runway shall be adequate to meet the operational requirements of the aeroplanes for which the runway is intended and should be not less than the longest length determined by applying the corrections for local conditions to the operations and performance characteristics of the relevant aeroplanes.

(b) Secondary runway

The length of a secondary runway shall be determined similarly to primary runways except that it needs only to be adequate for those aeroplanes

which require to use that secondary runway in addition to the other runway or runways in order to obtain a usability factor of at least 95 per cent.

(c) Runways with stopways or clearways

Where a runway is associated with a stopway or clearway, an actual runway length less than that resulting from application of paragraph (a) and (b) above, as appropriate, shall be considered satisfactory, but in such a case any combination of runway, stopway and clearway provided shall permit compliance with the operational requirements for take-off and landing of the aeroplanes the runway is intended to serve.

(4) Width of runways

(a) The width of a runway shall be not less than the appropriate dimension specified in Table 1.

Outer Main Gear Wheel Span (OMGWS)				
Code number	Up to but not including 4.5 m	4.5 m up to but not including 6 m	6 m up to but not including 9 m	9 m up to but not including 15 m
1[a]	*18 m*	*18 m*	*23 m*	–
2[a]	*23 m*	*23 m*	*30 m*	–
3	*30 m*	*30 m*	*30 m*	*45 m*
4	–	–	*45 m*	*45 m*

a. The width of a precision approach runway should be not less than 30 m where the code number is 1 or 2.

Table 1: Runway widths as determined by OMGWS.

(b) The width of a precision approach runway shall be not less than 30 m where the code number is 1 or 2.

(5) Minimum distance between parallel runways

(a) Where parallel non-instrument runways are intended for simultaneous use, the minimum distance between their centre lines shall be:

(i) 210 m where the higher code number is 3 or 4;

(ii) 150 m where the higher code number is 2; and

(iii) 120 m where the higher code number is 1.

(b) Where parallel instrument runways are intended for simultaneous use subject to conditions specified in CARS Part 172 and Part 171, the minimum distance between their centre lines shall be:

(i) 1 035 m for independent parallel approaches;

(ii) 915 m for dependent parallel approaches;

(iii) 760 m for independent parallel departures;

(iv) 760 m for segregated parallel operations;

except that for segregated parallel operations the specified minimum distance -

(aa) shall be decreased by 30m for each 150m that the arrival runway is staggered toward the arriving aircraft, to a minimum of 300m;

(bb) shall be increased by 30m for each 150 m that the arrival runway is staggered away from the arriving aircraft; and

(cc) for independent parallel approaches, combinations of minimum distances and associated conditions other than those specified in the SA-CATS 172 may be applied when it is determined that such combinations would not adversely affect the safety of aircraft operations.

(6) Slopes on runways

(a) Longitudinal slopes

(i) The slope computed by dividing the difference between the maximum and minimum elevation along the runway centre line by the runway length shall not exceed:

(aa) Where slope changes cannot be avoided, a slope change between two consecutive slopes shall not exceed:

— 1.5 per cent where the code number is 3 or 4; and

— 2 per cent where the code number is 1 or 2.

(bb) The transition from one slope to another shall be accomplished by a curved surface with a rate of change not exceeding:

— 0.1 % per 30m (minimum radius of curvature of 30 000m) where the code number is 4;

— 0.2 % per 30 m (minimum radius of curvature of 15 000 m) where the code number is 3; and

— 0.4 % per 30 m (minimum radius of curvature of 7 500 m) where the code number is 1 or 2.

(b) Longitudinal slope changes

(i) Where slope changes cannot be avoided, a slope change between two consecutive slopes shall not exceed:

(aa) 1.5 per cent where the code number is 3 or 4; and

(bb) 2 per cent where the code number is 1 or 2.

(ii) The transition from one slope to another shall be accomplished by a curved surface with a rate of change not exceeding:

(aa) 0.1 per cent per 30 m (minimum radius of curvature of 30 000 m) where the code number is 4;

(bb) 0.2 per cent per 30 m (minimum radius of curvature of 15 000 m) where the code number is 3; and

(cc) 0.4 per cent per 30 m (minimum radius of curvature of 7 500 m) where the code number is 1 or 2.

(7) Sight distance

(a) Where slope changes cannot be avoided, they shall be such that there will be an unobstructed line of sight from:

(i) any point 3 m above a runway to all other points 3 m above the runway within a distance of at least half the length of the runway where the code letter is C, D, E or F;

(ii) any point 2 m above a runway to all other points 2 m above the runway within a distance of at least half the length of the runway where the code letter is B; and

(iii) any point 1.5 m above a runway to all other points 1.5 m above the runway within a distance of at least half the length of the runway where the code letter is A.

(8) Distance between slope changes

(a) Undulations or appreciable changes in slopes located close together along a runway shall be avoided.

(b) The distance between the points of intersection of two successive curves shall not be less than the sum of the absolute numerical values of the corresponding slope changes multiplied by the appropriate value as follows:

(i) 30 000m where the code number is 4;

(ii) 15 000m where the code number is 3;

(iii) 5 000m where the code number is 1 or 2; or

(iv) 45m,

whichever is greater.

(b) Transverse slope

(i) To promote the most rapid drainage of water, the runway surface shall, if practicable, be cambered except where a single crossfall from high to low in the direction of the wind most frequently associated with rain would ensure rapid drainage.

(ii) The transverse slope shall be:

(aa) 1.5 % where the code letter is C, D, E or F; and

(bb) 2 % where the code letter is A or B;

in any event shall not exceed 1.5 % or 2 %, as applicable, nor be less than 1 per cent except at runway or taxiway intersections where flatter slopes may be necessary.

(cc) For a cambered surface the transverse slope on each side of the centre line shall be symmetrical.

(dd) The transverse slope shall be substantially the same throughout the length of a runway except at an intersection with another runway or a taxiway

where an even transition shall be provided taking account of the need for adequate drainage.

(9) Strength of runways

(a) A runway shall be capable of withstanding the traffic of aeroplanes the runway is intended to serve.

(10) Surface of runways

(a) The surface of a runway shall be constructed without irregularities that would impair the runway surface friction characteristics or otherwise adversely affect the take-off or landing of an aeroplane.

(b) A paved runway shall be so constructed or resurfaced as to provide surface friction characteristics at or above the minimum friction level set by the Director.

(c) The surface of a paved runway shall be evaluated when constructed or resurfaced to determine that the surface friction characteristics achieve the design objectives.

(d) Measurements of the surface friction characteristics of a new or resurfaced paved runway shall be made with a continuous friction measuring device using self-wetting features.

(e) The average surface texture depth of a new surface shall be not less than 1.0mm.

(f) When the surface is grooved or scored, the grooves or scorings shall be either perpendicular to the runway centre line or parallel to non-perpendicular transverse joints, where applicable.

(11) Runway shoulders

(a) Runway shoulders shall be provided for a runway where the code letter is D, E or F, of which the width shall be:

(i) For aeroplanes with OMGWS from 9m up to but not including 15m, the runway shoulders shall extend symmetrically on each side of the runway so that the overall width of the runway and its shoulders is not less than:

(aa) 60m where the code letter is D or E;

(bb) 60m where the code letter is F with two- or three-engined aeroplanes; and

(cc) 75m where the code letter is F with four (or more)-engined aeroplanes.

(12) Slopes on runway shoulders

The surface of the shoulder that abuts the runway should be flush with the surface of the runway and its transverse slope should not exceed 2.5 %.

(13) Strength of runway shoulders

The portion of a runway shoulder between the runway edge and a distance of 30m from the runway centre line shall be prepared or constructed so as to be capable, in the event of an aeroplane running off the runway, of supporting the aeroplane without inducing structural damage to the aeroplane and of supporting ground vehicles which may operate on the shoulder.

(14) Surface of runway shoulders

(a) A runway shoulder shall be prepared or constructed so as to resist erosion and the ingestion of the surface material by aeroplane engines.

(b) Runway shoulders for code letter F aeroplanes shall be paved to a minimum overall width of runway and shoulder of not less than 60m.

(15) Runway turn pads

(a) Where the end of a runway is not served by a taxiway or a taxiway turnaround and where the code letter is D, E or F, a runway turn pad shall be provided to facilitate a 180 ̊degree turn of aeroplanes shall follow the layout as per Diagram 1: Typical turn pad layout.

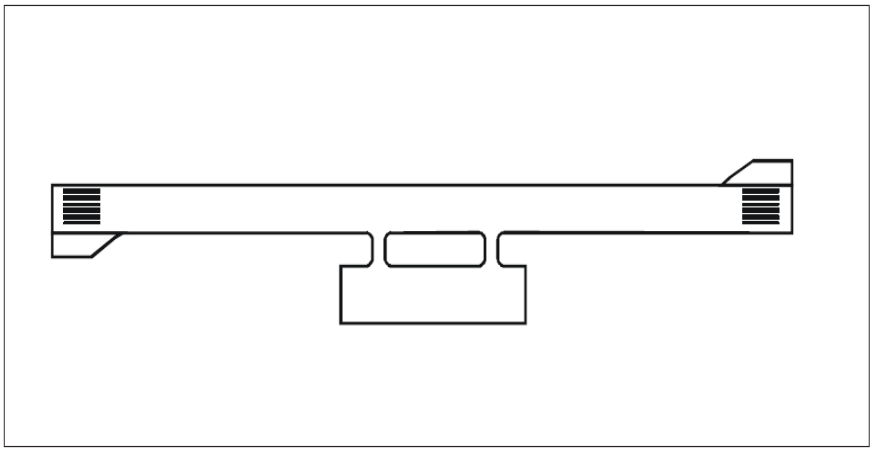


Diagram 1: Typical turn pad layout.

(b) Where the end of a runway is not served by a taxiway or a taxiway turnaround and where the code letter is A, B or C, a runway turn pad shall be provided to facilitate a 180-degree turn of aeroplanes.

(c) The runway turn pad shall be located on either the left or right side of the runway and adjoining the runway pavement at both ends of the runway and at some intermediate locations where deemed necessary.

(d) The intersection angle of the runway turn pad with the runway shall not exceed 30 degrees.

(e) The nose wheel steering angle to be used in the design of the runway turn pad shall not exceed 45 degrees.

(f) The design of a runway turn pad shall be such that, when the cockpit of the aeroplane for which the turn pad is intended remains over the turn pad marking, the clearance distance between any wheel of the aeroplane

landing gear and the edge of the turn pad shall be not less than that given by Table 2: OMGWS for runway turn pads.

	OMGWS			
	Up to but not including 4.5 m	4.5 m up to but not including 6 m	6 m up to but not including 9 m	9 m up to but not including 15 m
Clearance	1.50 m	2.25 m	3 m[a] or 4 m[b]	4 m

a. *If the turn pad is intended to be used by aeroplanes with a wheel base less than 18 m.*

b. *If the turn pad is intended to be used by aeroplanes with a wheel base equal to or greater than 18 m.*

Note.— Wheel base means the distance from the nose gear to the geometric centre of the main gear.

Table 2: OMGWS for runway turn pads.

(g) The longitudinal and transverse slopes on a runway turn pad shall be sufficient to prevent the accumulation of water on the surface and facilitate rapid drainage of surface water. The slopes should be the same as those on the adjacent runway pavement surface.

(h) The strength of a runway turn pad shall be at least equal to that of the adjoining runway which it serves, due consideration being given to the fact that the turn pad will be subjected to slow-moving traffic making hard turns and consequent higher stresses on the pavement.

(i) The surface of a runway turn pad shall not have surface irregularities that may cause damage to an aeroplane using the turn pad.

(j) The surface of a runway turn pad shall be so constructed or resurfaced as to provide surface friction characteristics at least equal to that of the adjoining runway.

(k) The runway turn pads shall be provided with shoulders of such width as is necessary to prevent surface erosion by the jet blast of the most demanding aeroplane for which the turn pad is intended, and any possible foreign object damage to the aeroplane engines.

(l) The strength of runway turn pad shoulders shall be capable of withstanding the occasional passage of the aeroplane it is designed to serve without inducing structural damage to the aeroplane and to the supporting ground vehicles that may operate on the shoulder.

(16) Runway strips

(a) A runway and any associated stopways shall be included in a strip and the dimensions shall be:

(i) Length of runway strips

(aa) A strip shall extend before the threshold and beyond the end of the runway or stopway for a distance of at least:

(Aa) 60m where the code number is 2, 3 or 4;

(Bb) 60m where the code number is 1 and the runway is an instrument one; and

(Cc) 30m where the code number is 1 and the runway is a non-instrument one.

(ii) Width of runway strips

(aa) A strip including a precision approach runway shall, wherever practicable, extend laterally to a distance of at least:

(Aa) 140m where the code number is 3 or 4; and

(Bb) 70m where the code number is 1 or 2;

(bb) on each side of the centre line of the runway and its extended centre line throughout the length of the strip.

(cc) A strip including a non-precision approach runway shall extend laterally to a distance of at least:

(Aa) 140m where the code number is 3 or 4; and

(Bb) 70 m where the code number is 1 or 2;

on each side of the centre line of the runway and its extended centre line throughout the length of the strip.

(dd) A strip including a non-instrument runway shall extend on each side of the centre line of the runway and its extended centre line throughout the length of the strip, to a distance of at least:

(Aa) 75m where the code number is 3 or 4;

(Bb) 40 where the code number is 2; and

(Cc) 30m where the code number is 1.

(iii) Objects on runway strips

(aa) An object situated on a runway strip which may endanger aeroplanes shall be regarded as an obstacle and should, as far as practicable, be removed.

(bb) No fixed object, other than visual aids required for air navigation or those required for aircraft safety purposes and which must be sited on the runway strip, and meet the frangibility requirements, shall be permitted on any part of a

runway strip of a precision approach runway delineated by the lower edges of the inner transitional surfaces.

(cc) No mobile object shall be permitted on this part of the runway strip during the use of the runway for landing or take-off.

(iv) Grading of runway strips

(aa) That portion of a strip of an instrument runway within a distance of at least:

(Aa) 75m where the code number is 3 or 4; and

(Bb) 40m where the code number is 1 or 2;

from the centre line of the runway and its extended centre line shall provide a graded area for aeroplanes which the runway is intended to serve in the event of an aeroplane running off the runway.

(bb) That portion of a strip of a non-instrument runway within a distance of at least:

(Aa) 75m where the code number is 3 or 4;

(Bb) 40m where the code number is 2; and

(Ca) 30m where the code number is 1;

from the centre line of the runway and its extended centre line shall provide a graded area for aeroplanes which the runway is intended to serve in the event of an aeroplane running off the runway.

(cc) The surface of that portion of a strip that abuts a runway, shoulder or stopway shall be flush with the surface of the runway, shoulder or stopway.

(dd) That portion of a strip to at least 30m before the start of a runway shall be prepared against blast erosion in order to protect a landing aeroplane from the danger of an exposed edge.

(ee) Where the areas as refers in paragraph (dd) above have paved surfaces, they shall be able to withstand the occasional passage of the critical aeroplane for runway pavement design.

(v) Slopes on runway strips

(i) Longitudinal slopes

(aa) A longitudinal slope along that portion of a strip to be graded shall not exceed:

(Aa)1.5 % where the code number is 4;

(Bb) 1.75 % where the code number is 3; and

(Cc) 2% where the code number is 1 or 2.

(bb) Longitudinal slope changes -

(Aa) Slope changes on that portion of a strip to be graded shall be as gradual as practicable; and

(Bb) abrupt changes or sudden reversals of slopes avoided.

(ii) Transverse slopes

(aa) Transverse slopes on that portion of a strip to be graded shall be adequate to prevent the accumulation of water on the surface but should not exceed:

(Aa) 2.5% where the code number is 3 or 4; and

(Bb) 3 % where the code number is 1 or 2;

except that to facilitate drainage the slope for the first 3 m outward from the runway, shoulder or stopway edge should be negative as measured in the direction away from the runway and may be as great as 5%.

(bb) The transverse slopes of any portion of a strip beyond that to be graded shall not exceed an upward slope of 5% as measured in the direction away from the runway.

(vi) Strength of runway strips

(i) That portion of a strip of an instrument runway within a distance of at least:

(aa) 75m where the code number is 3 or 4; and

(bb) 40m where the code number is 1 or 2;

line of the runway and its extended centre line shall be so prepared or constructed as to minimize hazards arising from differences in load-bearing capacity to aeroplanes which the runway is intended to serve in the event of an aeroplane running off the runway.

(ii) That portion of a strip containing a non-instrument runway within a distance of at least:

(aa) 75m where the code number is 3 or 4;

(bb) 40m where the code number is 2; and

(cc) 30m where the code number is 1;

from the centre line of the runway and its extended centre line shall be so prepared or constructed as to minimize hazards arising from differences in load-bearing capacity to aeroplanes which the runway

is intended to serve in the event of an aeroplane running off the runway.

(iii) That portion of a strip containing a non-instrument runway within a distance of at least:

(aa) 75m where the code number is 3 or 4;

(bb) 40m where the code number is 2; and

(cc) 30m where the code number is 1;

from the centre line of the runway and its extended centre line shall be so prepared or constructed as to minimize hazards arising from differences in load-bearing capacity to aeroplanes which the runway is intended to serve in the event of an aeroplane running off the runway.

(17) Runway end safety areas

(a) A runway end safety area shall be provided at each end of a runway strip where:

(i) the code number is 3 or 4; and

(ii) the code number is 1 or 2 and the runway is an instrument runway.

(b) A runway end safety area shall be provided at each end of a runway strip where the code number is 1 or 2 and the runway is a non-instrument runway.

(c) Dimensions of runway end safety areas

(i) A runway end safety area shall extend from the end of a runway strip to a distance of at least 90 m where:

(aa) the code number is 3 or 4; and

(bb) the code number is 1 or 2 where the runway is an instrument runway.

(ii) If an arresting system is installed, the above length may be reduced, based on the design specification of the system, subject to acceptance by the Director.

(iii) A runway end safety area shall extend from the end of a runway strip to a distance of:

(aa) 240m where the code number is 3 or 4; or a reduced length when an arresting system is installed;

(bb) 120m where the code number is 1 or 2 where the runway is an instrument runway; or a reduced length when an arresting system is installed; and

(cc) 30m where the code number is 1 or 2 and the runway is a non-instrument one.

(iv) The width of a runway end safety area shall be at least twice that of the associated runway.

(v) The width of a runway end safety area shall, wherever practicable, be equal to that of the graded portion of the associated runway strip.

(d) Objects on runway end safety areas

An object situated on a runway end safety area which may endanger aeroplanes shall be regarded as an obstacle and shall be removed.

(e) Clearing and grading of runway end safety areas

A runway end safety area shall provide a cleared and graded area for aeroplanes which the runway is intended to serve in the event of an aeroplane undershooting or overrunning the runway.

(f) Slopes on runway end safety areas

The slopes of a runway end safety area shall be such that no part of the runway end safety area penetrates the approach or take-off climb surface.

(g) Longitudinal slopes

The longitudinal slopes of a runway end safety area shall not exceed a downward slope of 5%. Longitudinal slope changes shall be as gradual as practicable and abrupt changes or sudden reversals of slopes avoided.

(h) Transverse slopes

The transverse slopes of a runway end safety area shall not exceed an upward or downward slope of 5%. Transitions between differing slopes shall be as gradual as practicable.

(i) Strength of runway end safety areas

A runway end safety area shall be so prepared or constructed as to reduce the risk of damage to an aeroplane undershooting or overrunning the runway, enhance aeroplane deceleration and facilitate the movement of rescue and firefighting vehicles as required in regulation 139.02.15.

(18) Clearways and Stopways

(a) The origin of a clearway shall be at the end of the take-off run available.

(b) The length of a clearway shall not exceed half the length of the take-off run available.

(c) A stopway shall have the same width as the runway with which it is associated.

(19) Width of Clearways

(a) A clearway shall extend laterally on each side of the extended centre line of the runway, to a distance of at least:

(i) 75m for instrument runways; and

(ii) half of the width of the runway strip for non-instrument runways.

(20) Slopes on clearways

(a) The ground in a clearway shall not project above a plane having an upward slope of 1.25 per cent, the lower limit of this plane being a horizontal line which:

(i) is perpendicular to the vertical plane containing the runway centre line; and

(ii) passes through a point located on the runway centre line at the end of the take-off run available.

(b) Abrupt upward changes in slope shall be avoided when the slope on the ground in a clearway is relatively small or when the mean slope is upward. In such situations, in that portion of the clearway within a distance of 22.5m or half the runway width whichever is greater on each side of the extended centre line, the slopes, slope changes and the transition from runway to clearway shall generally conform with those of the runway with which the clearway is associated.

(21) Objects on clearways

An object situated on a clearway which may endanger aeroplanes in the air shall be regarded as an obstacle and shall be removed.

(22) Stopways

(a) A stopway shall have the same width as the runway with which it is associated.

(b) Slopes and changes in slope on a stopway, and the transition from a runway to a stopway, shall comply with paragraph (6)(a) and (8)(b) above for the runway with which the stopway is associated except that:

(i) the limitation in paragraph (6)(b) of a 0.8% slope for the first and last quarter of the length of a runway need not be applied to the stopway; and

(ii) at the junction of the stopway and runway and along the stopway the maximum rate of slope change may be 0.3% per 30m (minimum radius of curvature of 10 000m) for a runway where the code number is 3 or 4.

(c) A stopway shall be prepared or constructed so as to be capable, in the event of an abandoned take-off, of supporting the aeroplane which the stopway is intended to serve without inducing structural damage to the aeroplane.

(d) The surface of a paved stopway shall be so constructed or resurfaced as to provide surface friction characteristics at or above those of the associated runway.

(23) Radio altimeter operating area

(a) A radio altimeter operating area shall be established in the pre-threshold area of a precision approach runway.

(b) Length of the area

A radio altimeter operating area shall extend before the threshold for a distance of at least 300m.

(c) Width of the area

A radio altimeter operating area shall extend laterally, on each side of the extended centre line of the runway, to a distance of 60m, except that, when special circumstances so warrant, the distance may be reduced to no less than 30m if an aeronautical study indicates that such reduction would not affect the safety of operations of aircraft.

(d) Longitudinal slope changes

On a radio altimeter operating area, slope changes shall be avoided or kept to a minimum. Where slope changes cannot be avoided, the slope changes shall be as gradual as practicable and abrupt changes or sudden reversals of slopes avoided. The rate of change between two consecutive slopes shall not exceed 2% per 30m.

(24) Taxiways

(a) Taxiways shall be provided to permit the safe and expeditious surface movement of aircraft.

(b) Sufficient entrance and exit taxiways for a runway shall be provided to expedite the movement of aeroplanes to and from the runway and provision of rapid exit taxiways considered when traffic volumes are high.

(c) The design of a taxiway shall be such that, when the cockpit of the aeroplane for which the taxiway is intended remains over the taxiway centre line markings, the clearance distance between the outer main wheel of the aeroplane and the edge of the taxiway shall be not less than that given dimensions in Table 3: Taxiway clearance distance.

	OMGWS			
	Up to but not including 4.5 m	4.5 m up to but not including 6 m	6 m up to but not including 9 m	9 m up to but not including 15 m
Clearance	1.50 m	2.25 m	3 m[a,b] or 4 m[c]	4 m

a. *On straight portions.*

b. *On curved portions if the taxiway is intended to be used by aeroplanes with a wheel base of less than 18 m.*

c. *On curved portions if the taxiway is intended to be used by aeroplanes with a wheel base equal to or greater than 18 m.*

Note.— Wheel base means the distance from the nose gear to the geometric centre of the main gear.

Table 3: Taxiway clearance distance

(25) Width of taxiways

(a) A straight portion of a taxiway shall have a width of not less than that given by Table 4: Width of taxiways.

	OMGWS			
	Up to but not including 4.5 m	4.5 m up to but not including 6 m	6 m up to but not including 9 m	9 m up to but not including 15 m
Taxiway width	7.5 m	10.5 m	15 m	23 m

Table 4: Width of taxiway

(26) Taxiway curves

Changes in direction of taxiways shall be as few and small as possible. The radii of the curves shall be compatible with the manoeuvring capability and normal taxiing speeds of the aeroplanes for which the taxiway is intended. The design of the curve shall be such that, when the cockpit of the aeroplane remains over the taxiway centre line markings, the clearance distance between the outer main wheels of the aeroplane and the edge of the taxiway should not be less than those in paragraph (1.2) (3) and shall be illustrated as Diagram 2: Taxiway curve.

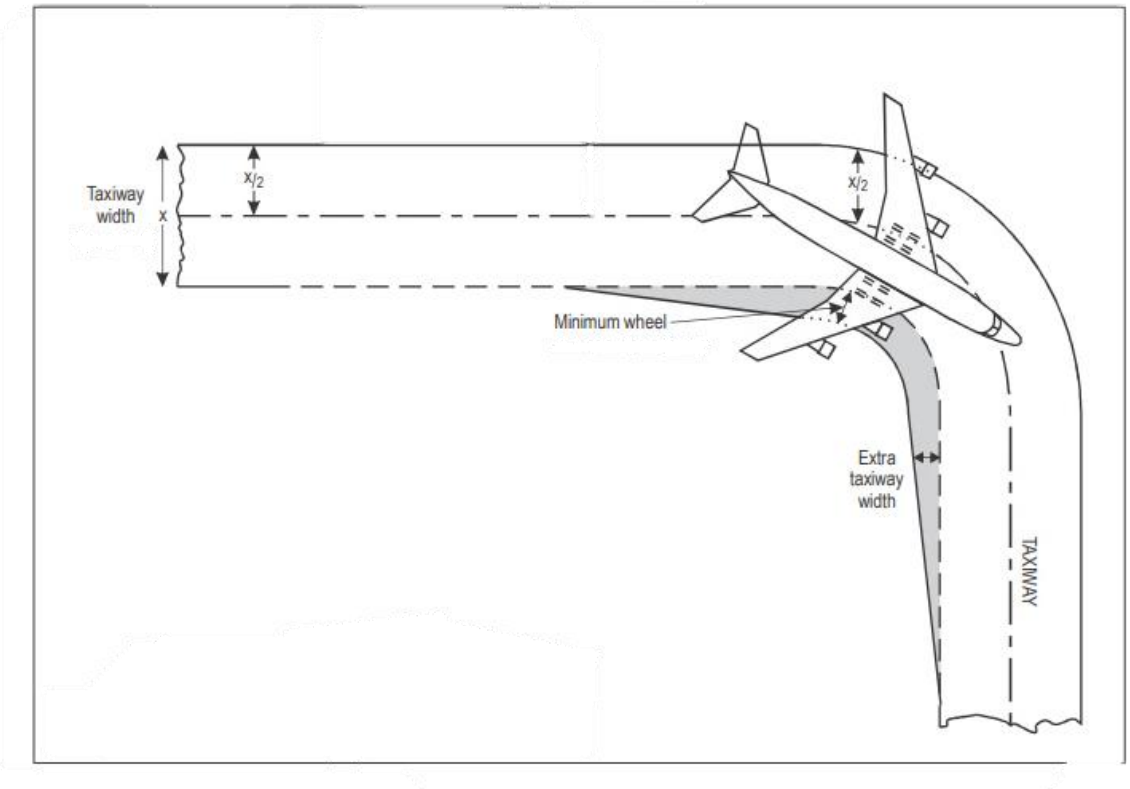


Diagram 2 Taxiway curve

(27) Junctions and intersections

(a) To facilitate the movement of aeroplanes, fillets shall be provided at junctions and intersections of taxiways with runways, aprons, and other taxiways.

(b) The design of the fillets shall ensure that the minimum wheel clearances as specified by OMGWS in Table 3: Taxiway clearance distance are maintained when aeroplanes are manoeuvring through the junctions or intersections.

(28) Taxiway minimum separation distances

The separation distance between the centre line of a taxiway and the centre line of a runway, the centre line of a parallel taxiway or an object shall not be less than the appropriate dimension specified in Table 5: Taxiway minimum separation distances, except that it may be permissible to operate with lower separation distances at an existing aerodrome if an aeronautical study indicates that such lower separation distances would not adversely affect the safety or significantly affect the regularity of operations of aeroplanes.

Code letter	Distance between taxiway centre line and runway centre line (metres)								Taxiway centre line to taxiway centre line (metres)	Taxiway, other than aircraft stand taxilane, centre line to object (metres)	Aircraft stand taxilane centre line to aircraft stand taxilane centre line (metres)	Aircraft stand taxilane centre line to object (metres)
	Instrument runways Code number				Non-instrument runways Code number							
	1	2	3	4	1	2	3	4				
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
A	77.5	77.5	–	–	37.5	47.5	–	–	23	15.5	19.5	12
B	82	82	152	–	42	52	87	–	32	20	28.5	16.5
C	88	88	158	158	48	58	93	93	44	26	40.5	22.5
D	–	–	166	166	–	–	101	101	63	37	59.5	33.5
E	–	–	172.5	172.5	–	–	107.5	107.5	76	43.5	72.5	40
F	–	–	180	180	–	–	115	115	91	51	87.5	47.5

Table 5: Taxiway minimum separation distances

(29) Slopes on taxiways

(a) Taxiway Longitudinal slopes

(i) The longitudinal slope of a taxiway shall not exceed:

(aa) 1.5% where the code letter is C, D, E or F; and

(bb) 3% where the code letter is A or B.

(30) Longitudinal slope changes

(a) Where slope changes on a taxiway cannot be avoided, the transition from one slope to another slope shall be accomplished by a curved surface with a rate of change not exceeding:

(i) 1% per 30m (minimum radius of curvature of 3 000m) where the code letter is C, D, E or F; and

(ii) 1% per 25m (minimum radius of curvature of 2 500m) where the code letter is A or B.

(31) Sight distance

(a) Where a change in slope on a taxiway cannot be avoided, the change shall be such that, from any point:

(i) 3m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 300m from that point, where the code letter is C, D, E or F;

(ii) m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 200m from that point, where the code letter is B; and

(ii) 1.5m above the taxiway, it will be possible to see the whole surface of the taxiway for a distance of at least 150m from that point, where the code letter is A.

(32) Transverse slopes

(a) The transverse slopes of a taxiway shall be sufficient to prevent the accumulation of water on the surface of the taxiway but shall not exceed:

(i) 1.5% where the code letter is C, D, E or F; and

(ii) 2% per cent where the code letter is A or B.

(33) Taxiway Transverse slopes

(a) The transverse slopes of a taxiway shall be sufficient to prevent the accumulation of water on the surface of the taxiway but shall not exceed:

(i) 1.5% where the code letter is C, D, E or F; and

(ii) 2% where the code letter is A or B.

(34) Strength of taxiways

The strength of a taxiway shall be at least equal to that of the runway it serves, due consideration being given to the fact that a taxiway will be subjected to a greater density of traffic and, as a result of slow moving and stationary aeroplanes, to higher stresses than the runway it serves.

(35) Surface of taxiways

(a) The surface of a taxiway shall not have irregularities that cause damage to aeroplane structures.

(b) The surface of a paved taxiway shall be so constructed or resurfaced as to provide suitable surface friction characteristics.

(36) Rapid exit taxiways

(a) A rapid exit taxiway shall be designed with a radius of turn-off curve of at least:

(i) 550m where the code number is 3 or 4; and

(ii) 275m where the code number is 1 or 2;

(b) The radius of turn curve referred to in paragraph (a) shall enable exit speeds under wet conditions of:

(i) 93km/h where the code number is 3 or 4; and

(ii) 65km/h where the code number is 1 or 2.

(c) The radius of the fillet on the inside of the curve at a rapid exit taxiway shall be sufficient to provide a widened taxiway throat in order to facilitate early recognition of the entrance and turn-off onto the taxiway.

(d) A rapid exit taxiway shall include a straight distance after the turn-off curve sufficient for an exiting aircraft to come to a full stop clear of any intersecting taxiway.

(e) The intersection angle of a rapid exit taxiway with the runway shall not be greater than 45° nor less than 25° and preferably shall be 30°.

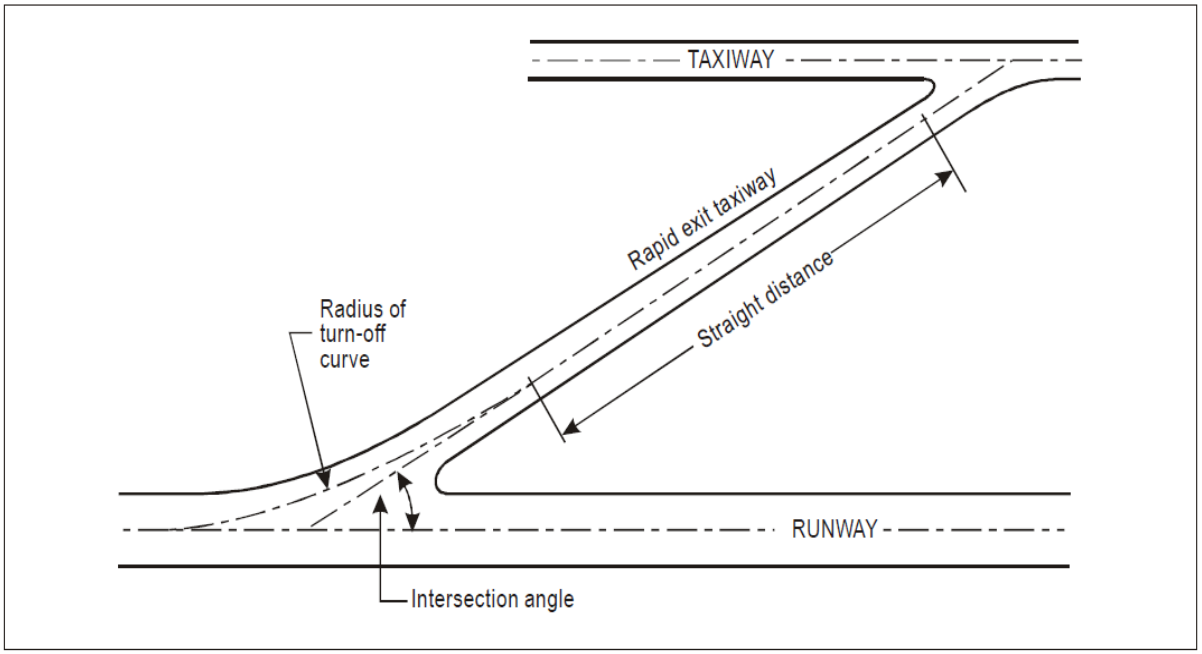


Diagram 3: Rapid exit taxiway

(37) Taxiways on bridges

(a) The width of that portion of a taxiway bridge capable of supporting aeroplanes, as measured perpendicularly to the taxiway centre line, shall not be less than the width of the graded area of the strip provided for that taxiway, unless a proven method of lateral restraint is provided which shall not be hazardous for aeroplanes for which the taxiway is intended.

(b) Access shall be provided to allow rescue and firefighting vehicles to intervene in both directions within the specified response time to the largest aeroplane for which the taxiway bridge is intended.

(c) A bridge shall be constructed on a straight section of the taxiway with a straight section on both ends of the bridge to facilitate the alignment of aeroplanes approaching the bridge.

(38) Taxiway shoulders

(a) Straight portions of a taxiway where the code letter is C, D, E or F shall be provided with shoulders which extend symmetrically on each side of the taxiway so that the overall width of the taxiway and its shoulders on straight portions is not less than the dimension.

(b) Straight portions of a taxiway where the code letter is C, D, E or F shall be provided with shoulders which extend symmetrically on each side of the taxiway so that the overall width of the taxiway and its shoulders on straight portions is not less than:

(i) 44m where the code letter is F;

(ii) 38m where the code letter is E;

(iii) 34m where the code letter is D; and

(iv) 25m where the code letter is C

(c) On taxiway curves and on junctions or intersections where increased pavement is provided, the shoulder width shall be not less than that on the adjacent straight portions of the taxiway.

(d) When a taxiway is intended to be used by turbine-engined aeroplanes, the surface of the taxiway shoulder shall be so prepared as to resist erosion and the ingestion of the surface material by aeroplane engines.

(39) Taxiway strips

(a) A taxiway, other than an aircraft stand taxilane, shall be included in a strip.

(b) A taxiway strip shall extend symmetrically on each side of the centre line of the taxiway throughout the length of the taxiway to at least the distance from the centre line given in Table 5: Taxiway minimum separation distances, column 11.

(c) The taxiway strip shall provide an area clear of objects which may endanger taxiing aeroplanes.

(40) Grading of taxiway strips

(a) The centre portion of a taxiway strip shall provide a graded area to a distance from the centre line of the taxiway of not less than that given by the following tabulation:

(i) 10.25m where the OMGWS is up to but not including 4.5m;

(ii) 11m where the OMGWS is 4.5m up to but not including 6m;

(iii) 12.50m where the OMGWS is 6m up to but not including 9m;

(iv) 18.50m where the OMGWS is 9m up to but not including 15m, where the code letter is D;

(v) 19m where the OMGWS is 9m up to but not including 15m, where the code letter is E; and

(vi) 22m where the OMGWS is 9 m up to but not including 15m, where the code letter is F.

(41) Slopes on taxiway strips

(a) The surface of the strip shall be flush at the edge of the taxiway or shoulder if provided, and the graded portion shall not have an upward transverse slope exceeding:

(i) 2.5% for strips where the code letter is C, D, E or F; and

(ii) 3 % for strips of taxiways where the code letter is A or B;

(b) The upward slope being measured with reference to the transverse slope of the adjacent taxiway surface and not the horizontal. The downward

transverse slope shall not exceed 5% measured with reference to the horizontal.

(c) The transverse slopes on any portion of a taxiway strip beyond that to be graded shall not exceed an upward or downward slope of 5% as measured in the direction away from the taxiway.

(42) Holding bays, runway-holding positions, intermediate holding positions and road-holding positions.

(a) Holding bays shall be provided when the traffic density is medium or heavy.

(b) A runway-holding position or positions shall be established:

(i) On the taxiway, at the intersection of a taxiway and a runway; and

(ii) At an intersection of a runway with another runway when the former runway is part of a standard taxi-route.

(c) A runway-holding position shall be established on a taxiway if the location or alignment of the taxiway is such that a taxiing aircraft or vehicle can infringe an obstacle limitation surface or interfere with the operation of radio navigation aids.

(d) An intermediate holding position shall be established on a taxiway at any point other than a runway-holding position where it is desirable to define a specific holding limit.

(e) A road-holding position shall be established at an intersection of a road with a runway.

(f) The distance between a holding bay, runway-holding position established at a taxiway/runway intersection or road-holding position and the centre line of a runway shall be in accordance with Table 6:Minimum distance from the runway centre line to a holding bay, runway-holding position or road-holding

position, in the case of a precision approach runway, such that a holding aircraft or vehicle will not interfere with the operation of radio navigation aids or penetrate the inner transitional surface.

(g) At elevations greater than 700m the distance of 90m specified in Table 6: Minimum distance from the runway centre line to a holding bay, runway-holding position or road-holding position, for a precision approach runway code number 4 shall be increased as follows:

(i) up to an elevation of 2 000m; 1m for every 100m in excess of 700m;

(ii) elevation in excess of 2 000m and up to 4 000m; 13 m plus 1.5m for every 100m in excess of 2 000m; and

(iii) elevation in excess of 4 000m and up to 5 000m; 43m plus 2m for every 100m in excess of 4 000m.

(iv) If a holding bay, runway-holding position or road-holding position for a precision approach runway code number 4 is at a greater elevation compared to the threshold, the distance specified in Table 6: Minimum distance from the runway centre line to a holding bay, runway-holding position or road-holding position shall be further increased 5m for every metre the bay or position is higher than the threshold.

(v) The location of a runway-holding position established in accordance section 26, paragraph (c) shall be such that a holding aircraft or vehicle will not infringe the obstacle free zone, approach surface, take-off climb surface or ILS/MLS critical/ sensitive area or interfere with the operation of radio navigation aids.

Type of runway	Code number 1	2	3	4
Non-instrument	30 m	40 m	75 m	75 m
Non-precision approach	40 m	40 m	75 m	75 m
Precision approach category I	60 m[b]	60 m[b]	90 m[a,b]	90 m[a,b]
Precision approach categories II and III	—	—	90 m[a,b]	90 m[a,b]
Take-off runway	30 m	40 m	75 m	75 m

Table 6: Minimum distance from the runway centre line to a holding bay, runway-holding position or road-holding position

(43) Aprons

(a) Aprons shall be provided where necessary to permit the on- and off-loading of passengers, cargo or mail as well as the servicing of aircraft without interfering with the aerodrome traffic.

(b) The total apron area shall be adequate to permit expeditious handling of the aerodrome traffic at its maximum anticipated density.

(c) Each part of an apron shall be capable of withstanding the traffic of the aircraft it is intended to serve, due consideration being given to the fact that some portions of the apron will be subjected to a higher density of traffic and, as a result of slow moving or stationary aircraft, to higher stresses than a runway.

(d) Slopes on an apron, including those on an aircraft stand taxilane, shall be sufficient to prevent accumulation of water on the surface of the apron but shall be kept as level as drainage requirements permit.

(e) On an aircraft stand the maximum slope shall not exceed 1%.

(44) Clearance distances on aircraft stands

(a) An aircraft stand should provide the following minimum clearances between an aircraft entering or exiting the stand and any adjacent building, aircraft on another stand and other objects:

Code letter	Clearance
A	3m
B	3 m
C	4.5 m
D	7.5 m
E	7.5 m
F	7.5 m

(b) When special circumstances so warrant, these clearances may be reduced at a nose-in aircraft stand, where the code letter is D, E or F:

(i) between the terminal, including any fixed passenger bridge, and the nose of an aircraft; and

(iii) over any portion of the stand provided with azimuth guidance by a visual docking guidance system.

(45) Isolated aircraft parking position

(a) An isolated aircraft parking position shall be designated, or the aerodrome control tower shall be advised of an area or areas suitable for the parking of an aircraft which is known or believed to be the subject of unlawful interference, or which for other reasons needs isolation from normal aerodrome activities.

(b) The isolated aircraft parking position shall be located at the maximum distance practicable and in any case never less than 100m from other parking positions, buildings or public areas, etc. Care shall be taken to ensure that the position is not located over underground utilities such as gas and aviation fuel and, to the extent feasible, electrical or communication cables.

(46) De-icing or anti-icing facilities

(a) Aeroplane de-icing or anti-icing facilities shall be provided at an aerodrome where icing conditions are expected to occur.

(b) De-icing or anti-icing facilities shall be provided either at aircraft stands or at specified remote areas along the taxiway leading to the runway meant for take-off, provided that adequate drainage arrangements for the collection and safe disposal of excess de-icing or anti-icing fluids are available to prevent ground water contamination. The effect of volume of traffic and departure flow rates shall also be considered.

(c) The remote de-icing or anti-icing facility shall be located to be clear of the obstacle limitation surfaces as specified in Technical Standard, not cause interference to the radio navigation aids and be clearly visible from the air traffic control tower for clearing the treated aeroplane.

(d) The remote de-icing or anti-icing facility shall be so located as to provide for an expeditious traffic flow, perhaps with a bypass configuration, and not require unusual taxiing manoeuvre into and out of the pads.

(e) The size of a de-icing or anti-icing pad shall be equal to the parking area required by the most demanding aeroplane in a given category with at least 3.8 m clear paved area all-round the aeroplane for the movement of the de-icing or anti-icing vehicles.

(f) The number of de-icing or anti-icing pads required shall be determined based on the meteorological conditions, the type of aeroplanes to be treated, the method of application of de-icing or anti-icing fluid, the type and capacity of the dispensing equipment used, and the departure flow rates.

(47) Slopes on de-icing or anti-icing pads

(a) The de-icing or anti-icing pads shall be provided with suitable slopes to ensure satisfactory drainage of the area and to permit collection of all excess de-icing or anti-icing fluid running off an aeroplane.

(b) The maximum longitudinal slope shall be as little as practicable, and the transverse slope shall not exceed 1%.

(48) Strength of de-icing or anti-icing pads

The de-icing/anti-icing pad shall be capable of withstanding the traffic of the aircraft itis intended to serve, due consideration being given to the fact that the de-icing/anti-icing pad (like an apron) will be subjected to a higher density of traffic and, as a result of slow-moving or stationary aircraft, to higher stresses than a runway.

(49) Clearance distances on a de-icing or anti-icing pad

(a) A de-icing or anti-icing pad should provide the minimum clearances specified in Technical Standard (1.3)(6)(a) or aircraft stands. If the pad layout is such as to include bypass configuration, the minimum separation distances specified in Table 5: Taxiway minimum separation distances in column 13, should be provided.

(b) Where the de-icing or anti-icing facility is located adjoining a regular taxiway, the taxiway minimum separation distance specified in Table 5: Taxiway minimum separation distances in column 11, should be provided. (See: Diagram 4: Minimum separation distance on a de-icing or anti-icing facility)

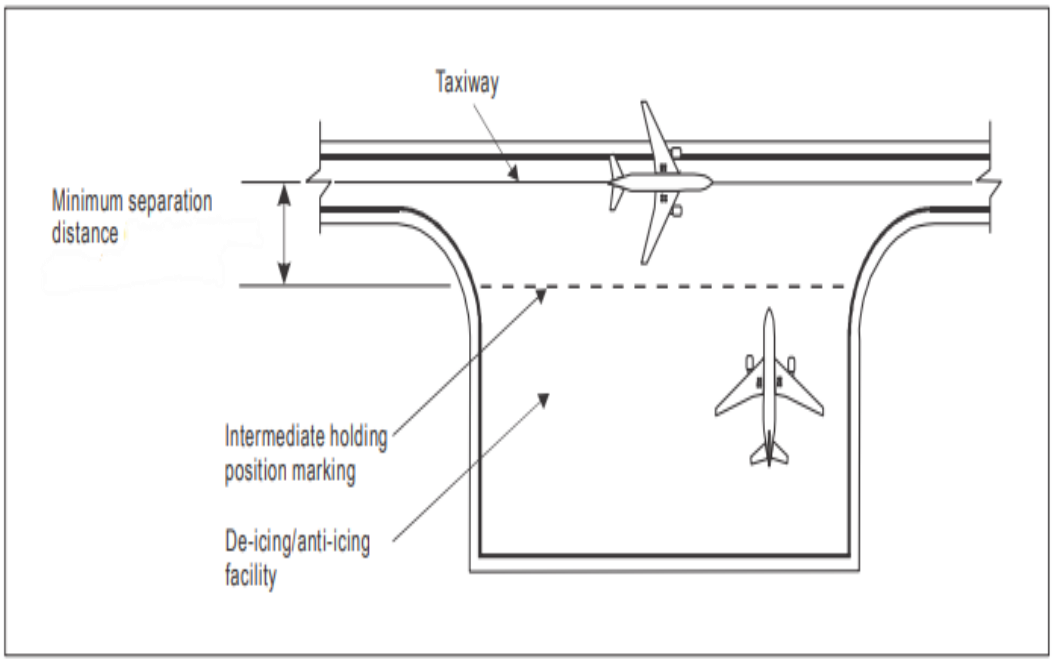


Diagram 4: Minimum separation distance on a de-icing/anti-icing facility.

(50) Environmental considerations

Where de-icing or anti-icing activities are carried out, the surface drainage should be planned to collect the run-off separately, preventing its mixing with the normal surface run-off so that it does not pollute the

(51) Obstacle limitation surfaces

(a) The following obstacle limitation surfaces shall be established for a runway –

(i) inner horizontal surface;

(ii) approach surface;

(iii) transitional surfaces; and

(iv) conical surface

(b) The following additional obstacle limitation surfaces shall be established for a precision approach runway category II or III –

(i) inner approach surface;

(ii) inner transitional surfaces; and

(iii) balked landing surface.

(c) for a non-instrument runway, new objects or extensions of existing objects shall not be permitted above an approach or transitional surface except when the new object or extension shall be shielded by an existing immovable object, or an aeronautical study determines that the object shall not adversely affect the safety or significantly affect the regularity of operations of aircraft;

(d) for a non-precision approach runway, new objects or extensions of existing objects shall not be permitted above an approach surface within 3000m of the inner edge or above a transitional surface except when the new object or extension shall be shielded by an existing immovable object, or an aeronautical study determines that the object shall not adversely affect the safety or significantly affect the regularity of operations of aircraft;

(e) for a precision approach runway fixed objects shall not be permitted above the inner approach surface, the inner transitional surface or the balked landing surface, except for frangible objects which because of their function shall be located on the strip. Mobile objects shall not be permitted above these surfaces during the use of the runway for landing;

(f) for a precision approach runway, new objects or extensions of existing objects shall not be permitted above an approach surface or a transitional surface except when the new object or extension shall be shielded by an existing immovable object, or an aeronautical study determines that the object shall not adversely affect the safety or significantly affect the regularity of operations of aircraft;

(g) a take-off climb surface shall be established for a runway meant for take-off; and

(h) new objects or extensions of existing objects shall not be permitted above a take-off climb surface except when the new object or extension shall be shielded by an existing immovable object, or an aeronautical study determines that the object shall not adversely affect the safety or significantly affect the regularity of operations of aircraft.

(52) Visual aids for navigation

Wind direction indicator

(a) An aerodrome shall be equipped with at least one wind direction indicator;

(b) A wind direction indicator shall be located so as to be visible from aircraft in flight or on the movement area and in such a way as to be free from the effects of air disturbances caused by nearby objects;

(c) The wind direction indicator shall –

(i) be in the form of a truncated cone made of fabric and shall have a length of not less than 3.6m and a diameter, at the larger end, of not less than 0.9m; and

(ii) be constructed so that it gives a clear indication of the direction of the surface wind and a general indication of the wind speed.

(d) the colour or colours shall be selected to make the wind direction indicator clearly visible and understandable from a height of at least 300m, having regard to background;

(e) where practicable, a single colour, preferably white or orange, shall be used;

(f) the location of at least one wind direction indicator shall be marked by a circular band 15 m in diameter and 1.2m wide and the band shall be centred about the wind direction indicator support and shall be in a colour chosen to give adequate conspicuity, preferably white; and

(g) provision shall be made for illuminating at least one wind indicator at an aerodrome intended for use at night.

(53) Signalling devices

(a) Where applicable –

(i) a signalling lamp shall be provided at a controlled aerodrome in the aerodrome control tower; and

(ii) a signalling lamp shall be capable of producing red, green and white signals, and of –

(aa) being aimed manually at any target as required;

(bb) giving a signal in any one colour followed by a signal in either of the two other colours; and

(cc) transmitting a message in any one of the three colours by Morse Code up to a speed of at least four words per minute.

(54) Signalling panel and signalling area

(a) The signal area shall be located so as to be visible for all angles of azimuth above an angle of 10° above the horizontal when viewed from a height of 300m;

(b) The signal area shall be an even horizontal surface at least 9m square; and

(c) The colour of the signal area shall be chosen to contrast with the colours of the signal panels used, and it shall be surrounded by a white border not less than 0.3m wide.

(55) Markings

Colour

(a) runway markings shall be white;

(b) taxiway markings, runway turn pad markings and aircraft stand shall be yellow;

(c) apron safety lines shall be of a conspicuous colour which shall contrast with that used for aircraft stand markings; and

(d) apron stand designators shall not be the same as taxiway designators.

(56) Runway markings

(a) A runway designation marking, centre line marking and threshold marking shall be provided on all paved runways;

(b) At an intersection of 2 or more runways the markings of the primary runway, except for the runway side stripe marking, shall be displayed and the markings of the other runway(s) shall be interrupted. The runway side stripe marking of the primary runway may be either continued across the intersection or interrupted;

(c) At an intersection of a runway and taxiway the markings of the runway shall be displayed and the markings of the taxiway interrupted, except that runway side stripe markings may be interrupted;

(d) Where a runway threshold is permanently displaced, arrows conforming to Diagram 1 (B) shall be provided on the portion of the runway before the displaced threshold. When it is temporarily displaced from the normal position, it shall be marked as Diagram 1 (A) or (B) and all markings prior to the displaced threshold shall be obscured except the runway centre line marking, which shall be converted to arrows.

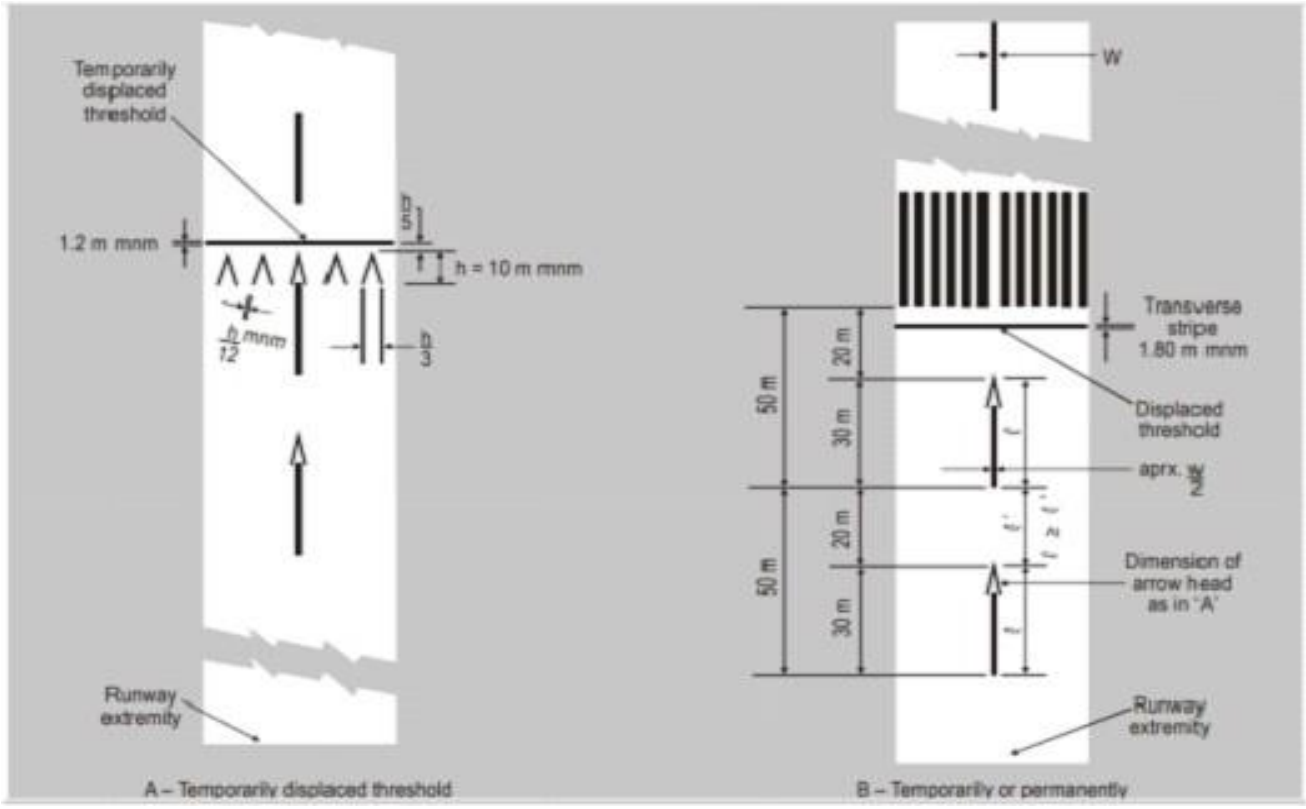


Diagram 1: Displaced threshold markings

(e) Where a paved runway threshold is permanently displaced, arrows shall be provided on the portion of the runway before the displaced threshold;

(f) An aiming point marking shall be provided at each approach end of a paved instrument runway where the aerodrome reference code number is 2, 3 or 4. The location and dimension of the aiming point markings shall be in accordance with Table 10:

(i) a runway designation marking shall consist of a two-digit number and on parallel runways shall be supplemented with a letter. On a single runway, dual parallel runways and triple parallel runways the two-digit number shall be the whole number nearest the one-tenth of the magnetic North when viewed from the direction of approach. On four or more parallel runways, one set of adjacent runways shall be numbered to the nearest one-tenth magnetic azimuth and the other set

of adjacent runways numbered to the next nearest one-tenth of the magnetic azimuth. When the above rule shall give a single digit number, it shall be preceded by a zero;

(ii) in the case of parallel runways, each runway designation number shall be supplemented by a letter as follows, in the order shown from left to right when viewed from the direction of approach:

(aa) for two parallel runways: “L” “R”:

(bb) for three parallel runways: “L” “C” “R”;

(cc) for four parallel runways: “L” “R” “L” “R”;

(dd) for five parallel runways: “L” “C” “R” “L” “R” or “L” “R” “L” “C” “R”; and

(ee) for six parallel runways: “L” “C” “R” “L” “C” “R”.

(iii) the numbers and letters shall be in the form and proportion shown on diagram 1. The dimensions shall be not less than those shown on diagram 1 but where the numbers are incorporated in the threshold marking, larger dimensions shall be used in order to fill adequately the gap between the stripes of the threshold marking.

Table 10: threshold stripes

Runway Width	**Number of stripes**
18m	4
23m	6
30m	8
45m	12
60m	16

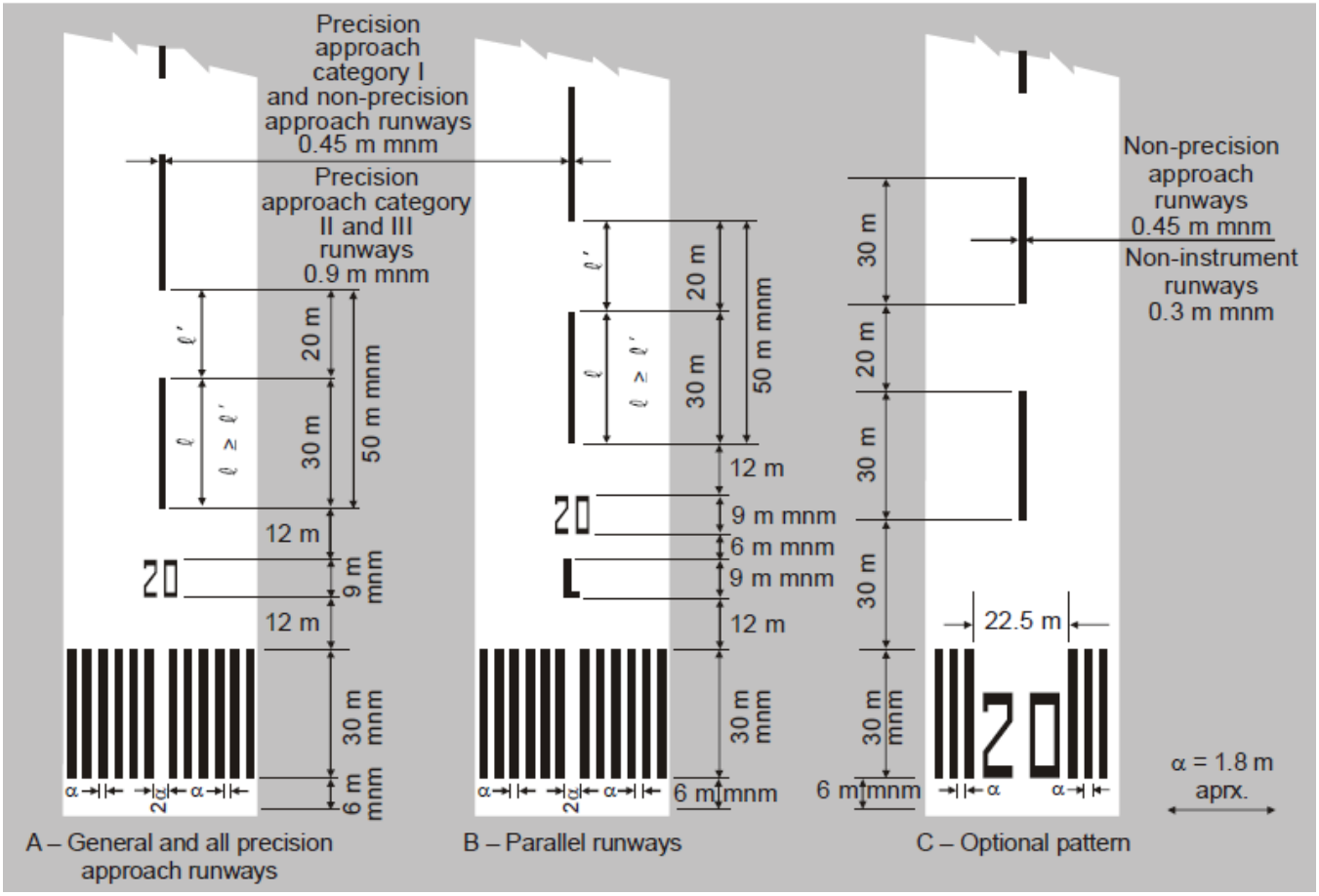


Diagram 1: Runway designation, centre line and threshold markings

(g) Touchdown Zone Markings

(i) A touchdown zone marking shall be provided in the touchdown zone of a paved precision approach runway where the aerodrome reference code number is 2, 3 or 4;

(ii) A touchdown zone marking shall conform to either of the two patterns in Diagram 2.

(aa) For the pattern in Diagram 2 (A), the markings shall be not less than 22.5m long and 3m wide.

(bb) For the pattern in Diagram 2 (B), each stripe of each marking shall be not less than 22.5 m long and 1.8m wide with a spacing of 1.5m

between adjacent stripes. The lateral spacing between the inner sides of the rectangles shall be equal to that of the aiming point marking where provided.

(cc) Where an aiming point marking is not provided, the lateral spacing between the inner sides of the rectangles shall correspond to the lateral spacing specified for the aiming point marking in Table 11 - columns 2, 3, 4 or 5, as appropriate.

(dd) The pairs of markings shall be provided at longitudinal spacings of 150 m beginning from the threshold, except that pairs of touchdown zone markings coincident with or located within 50m of an aiming point marking shall be deleted from the pattern.

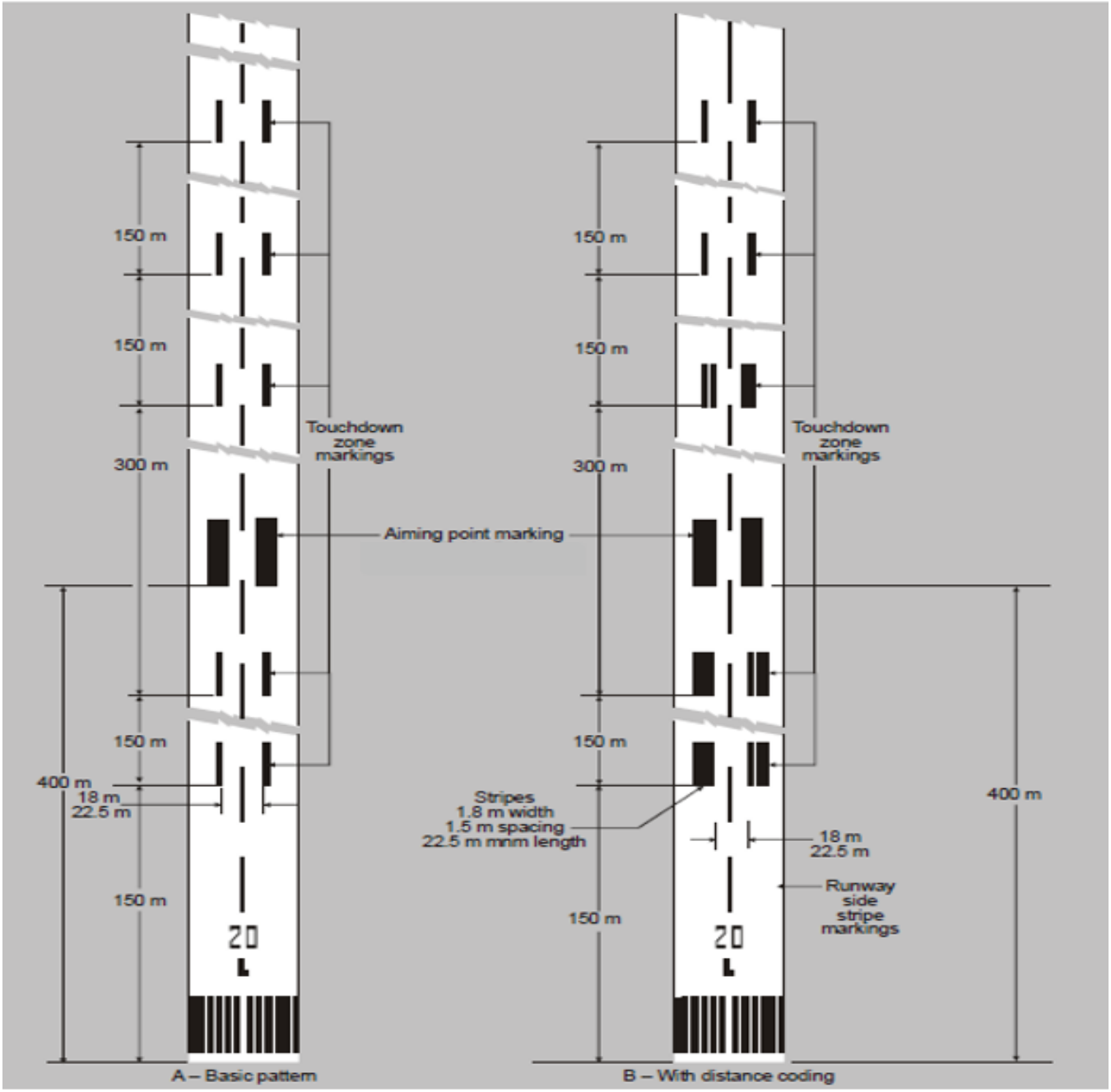


Diagram 2 Aiming point and touchdown zone markings (illustrated for a runway with a length of 2 400 m or more)

Table 11: Location and dimensions of aiming point marking

Location and dimensions	**Landing distance available**			
	Less than 800m	**800m up to but not including 1 200m**	**1 200m up to but not including 2 400m**	**2 400m and above**
(1)	(2)	(3)	(4)	(5)
Distance from threshold to beginning of marking	150m	250m	300m	400m
Length of stripe[a]	30-45m	30-45m	45-60m	45-60m
Width of stripe	4m	6m	6-10m[b]	6-10m[b]
Lateral spacing between inner sides of stripes	6m[c]	9m[c]	18-22.5m	18-22.5m
(a) The greater dimensions of the specified ranges are intended to be used where increased conspicuity is required.				
(b) The lateral spacing may be varied within these limits to minimize the contamination of the marking by rubber deposits.				
(c) These figures were deduced by reference to the outer main gear wheel span which is element 2 of the aerodrome reference code.				

(h) A touchdown zone marking shall consist of pairs of rectangular markings symmetrically disposed about the runway centre line with the number of such pairs related to the landing distance available and, where the marking is to be displayed at both the approach directions of a runway, the distance between the thresholds, as provided in Table 12;

Table 12: Touchdown zone markings

Landing distance available or the distance between thresholds	**Pairs of markings**
less than 900m	1
900m up to but not including 1 200m	2
1 200m up to but not including 1 500m	3
1 500m up to but not including 2 400m	4
2400m or more	6

(i) A runway side stripe marking shall be provided between the thresholds of a paved runway where there is a lack of contrast between the runway edges and the shoulders or the surrounding terrain;

(j) Runway turn pad marking—

(i) where a paved runway turn pad is provided, a runway turn pad marking shall be provided for continuous guidance to enable the aircraft to complete a 180 degree turn and align with the runway centre line; and

(ii) runway turn pad marking shall be at least 15cm in width and continuous in length.

(k) A runway centre line marking shall be located along the centre line of the runway between the runway designation markings as shown in Diagram 3 except when interrupted in compliance with 139.10.25.

(l) A runway centre line marking shall consist of a line of uniformly spaced stripes and gaps. The length of a stripe plus a gap shall be not less than 50m or more than 75m. The length of each stripe shall be at least equal to the length of the gap or 30m, whichever is greater.

(m) The width of the stripes shall be not less than –

(i) 0.90m on precision approach category II and III runways;

(ii) 0.45m on non-precision approach runways where the code number is 3 or 4, and precision approach category I runways; and

(iii) 0.30m on non-precision approach runways where the code number is 1 or 2, and on non-instrument runways.

(n) The stripes of the threshold marking shall commence 6m from the threshold.

(o) The stripes shall extend laterally to within 3m of the edge of a runway or to a distance of 27m on either side of a runway centre line, whichever results in the smaller lateral distance. Where a runway designation marking is placed within a threshold marking there shall be a minimum of three stripes on each side of the centre line of the runway. Where a runway designation marking is placed above a threshold marking, the stripes shall be continued across the runway. The stripes shall be at least 30m long and approximately 1.80m wide with spacings of approximately 1.80m between them except that, where the stripes are continued across a runway, a double spacing shall be used to separate the two stripes nearest the centre line of the runway, and in the case where the designation marking is included within the threshold marking this spacing shall be 22.5m.

(p) The runway turn pad marking shall be curved from the runway centre line into the turn pad. The radius of the curve shall be compatible with the manoeuvring capability and normal taxiing speeds of the aeroplanes for which the runway turn pad is intended. The intersection angle of the runway turn pad marking with the runway centre line should not be greater than 30 degrees.

(q) The runway turn pad marking shall be extended parallel to the runway centre line marking for a distance of at least 60m beyond the point of tangency where the code number is 3 or 4, and for a distance of at least 30m where the code number is 1 or 2.

(r) The design of the curve allowing the aeroplane to negotiate a 180-degree turn shall be based on a nose wheel steering angle not exceeding 45 degrees.

(s) The design of the turn pad marking shall be such that, when the cockpit of the aeroplane remains over the runway turn pad marking, the clearance distance between any wheel of the aeroplane landing gear and the edge of the runway turn pad should be not less than those specified in Technical Standard 139.10.7.

(t) At an intersection of a taxiway and a non-instrument, non-precision approach or take-off runway, the runway holding position marking shall be as shown in Diagram 4, pattern A.

(u) Where a single runway-holding position is provided at an intersection of a taxiway and a precision approach category I, II or III runway, the runway-holding position marking shall be as shown in Diagram 4, pattern A. Where two or three runway-holding positions are provided at such an intersection, the runway-holding position marking closest to the runway shall be as shown in Diagram 4, pattern A and the markings farther from the runway shall be as shown in Diagram 4, pattern B.

(v) The use of numbers alone on the manoeuvring area shall be reserved for the designation of runways.

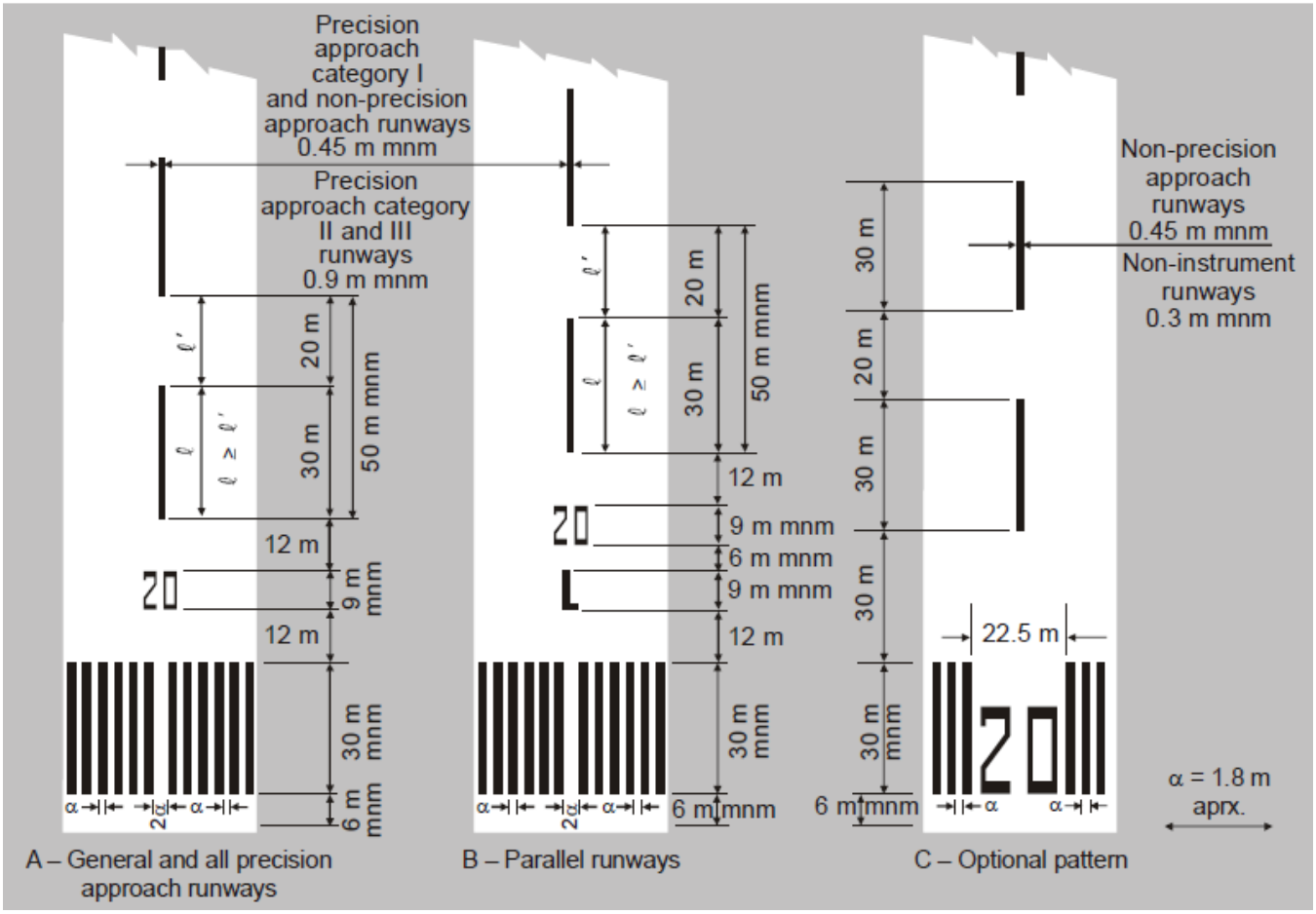


Diagram 3 Runway designation, centreline and threshold markings

(57) Taxiway Marking

(a) **Taxiway centre line marking**

(i) Taxiway centre line marking shall be provided on a paved taxiway and apron where the aerodrome reference code number is 3 or 4, in such a way as to provide continuous guidance between the runway centre line and aircraft stands.

(ii) Taxiway centre line marking shall be provided on a paved runway when the runway is part of a standard taxi-route where –

(aa) there is no runway centre line marking: or

(bb) the taxiway centre line is not coincident with the runway centre line.

(iii) Where provided, enhanced taxiway centre line marking shall be installed at each taxiway and runway intersection.

(iv) An enhanced taxiway centre line marking shall extend from the runway-holding position Pattern A to a distance of up to 47m in the direction of travel away from the runway.

(v) If the enhanced taxiway centre line marking intersects another runway-holding position marking, such as for a precision approach category II or III runway, which is located within 47m of the first runway-holding position marking, the enhanced taxiway centre line marking shall be interrupted 0.9m prior to and after the intersected runway-holding position marking.

(vi) The enhanced taxiway centre line marking shall continue beyond the intersected runway-holding position marking for at least three dashed line segments or 47m from start to finish, whichever is greater.

(b) **Runway holding position marking**

(i) A runway-holding position marking shall be displayed along a runway-holding position.

(ii) At an intersection of a taxiway and a non-instrument, non-precision approach or take-off runway, the runway holding position marking shall be as shown in diagram 2 pattern A.

(iii) Where a single runway-holding position is provided at an intersection of a taxiway and a precision approach category I, II or III runway, the runway-holding position marking shall be as shown in diagram 2, pattern A. Where two or three runway-holding positions are provided at such an intersection, the runway-holding position marking closer (closest) to the runway shall be as shown as, pattern A and the markings farther from the runway shall be as shown as pattern B.

(iv) The runway-holding position marking displayed at a runway-holding position established in accordance with regulation number 4 shall be as shown as, pattern A.

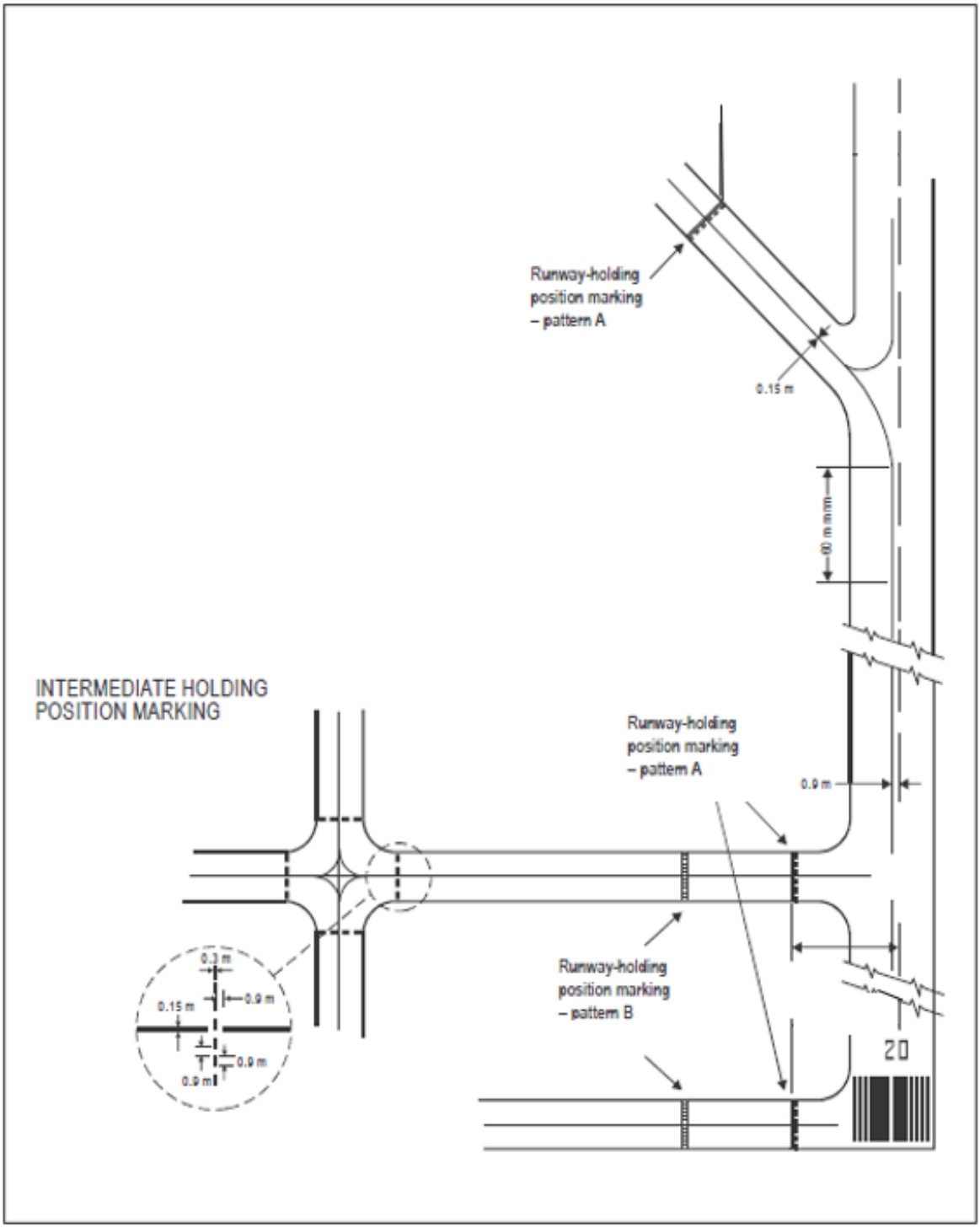

Runway-holding
position marking
– pattern A
0.15 m
INTERMEDIATE HOLDING
POSITION MARKING
Runway-holding
position marking
– pattern A
0.9 m
Runway-holding
position marking
– pattern B
0.3 m
0.15 m
0.9 m
0.9 m
0.9 m
20

Diagram 2

(c) **Intermediate holding position marking**

(i) An intermediate holding position marking shall be displayed along an intermediate holding position.

(ii) Where an intermediate holding position marking is displayed at an intersection of two paved taxiways, it shall be located across the taxiway at sufficient distance from the near edge of the intersecting taxiway to ensure safe clearance between taxiing aircraft. It shall be coincident with a stop bar or intermediate holding position lights, where provided.

(iii) An intermediate holding position marking shall consist of a single broken line as shown in Diagram 2.

(d) An enhanced taxiway centre line marking shall extend from the runway-holding position Pattern A to a distance of up to 47m in the direction of travel away from the runway.

(e) If the enhanced taxiway centre line marking intersects another runway-holding position marking, such as for a precision approach category II or III runway, which is located within 47m of the first runway-holding position marking, the enhanced taxiway centre line marking shall be interrupted 0.9 m prior to and after the intersected runway-holding position marking.

(f) The enhanced taxiway centre line marking shall continue beyond the intersected runway-holding position marking for at least three dashed line segments or 47m from start to finish, whichever is greater.

(g) A taxiway centre line marking shall be at least 15 cm in width and continuous in length except where it intersects with a runway-holding position marking or an intermediate holding position marking as shown in Diagram 4.

(h) An enhanced taxiway centre line marking shall be as shown in Diagram 5.

(i) At an intersection of a taxiway with a runway where the taxiway serves as an exit from the runway, the taxiway centre line marking shall be curved into the runway centre line marking as shown in Diagram 4. The taxiway centre line marking should be extended parallel to the runway centre line marking for a distance of at least 60 m beyond the point of tangency where the code number is 3 or 4, and for a distance of at least 30 m where the code number is 1 or 2.

(j) Where a taxiway centre line marking is provided on a runway in accordance with Technical Standard 139.10.26 (b) the marking shall be located on the centre line of the designated taxiway.

(k) Until 26 November 2026, the dimensions of runway-holding position markings shall be as shown in Diagram 6 pattern A1 or A2 or pattern B1 or B2, as appropriate.

(l) With effect from 26 November 2026, the dimensions of runway-holding position markings shall be as shown in Diagram 6 pattern A2 or pattern B2, as appropriate.

(m) Where increased conspicuity of a runway-holding position is required, the dimensions of runway-holding position marking shall be as shown in Diagram 6, pattern A2 or pattern B2, as appropriate.

(n) Where a pattern B runway-holding position marking is located on an area where it would exceed 60 m in length, the term “CAT II” or “CAT III” as

appropriate shall be marked on the surface at the ends of the runway-holding position marking and at equal intervals of 45 m maximum between successive marks. The letters shall be not less than 1.8 m in length and shall be placed not more than 0.9 m beyond the holding position marking.

(o) The runway-holding position marking displayed at a runway or runway intersection shall be perpendicular to the centreline of the runway forming part of the standard taxi-route. The pattern of the marking shall be as shown in Diagram 6, pattern A2.

(p) An intermediate holding position marking should be displayed along an intermediate holding position.

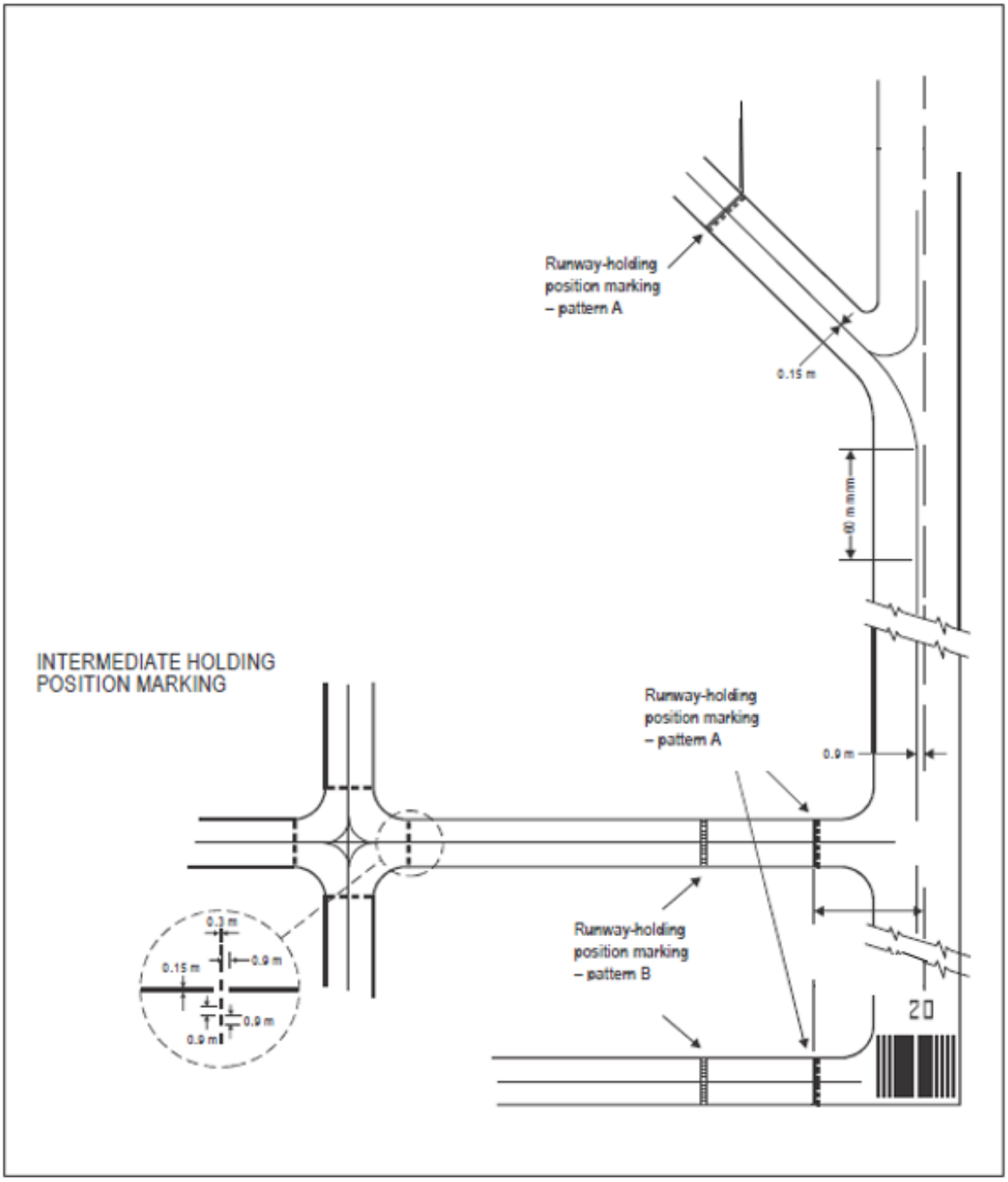


Diagram 4 – Taxiway markings (shown with runway markings)

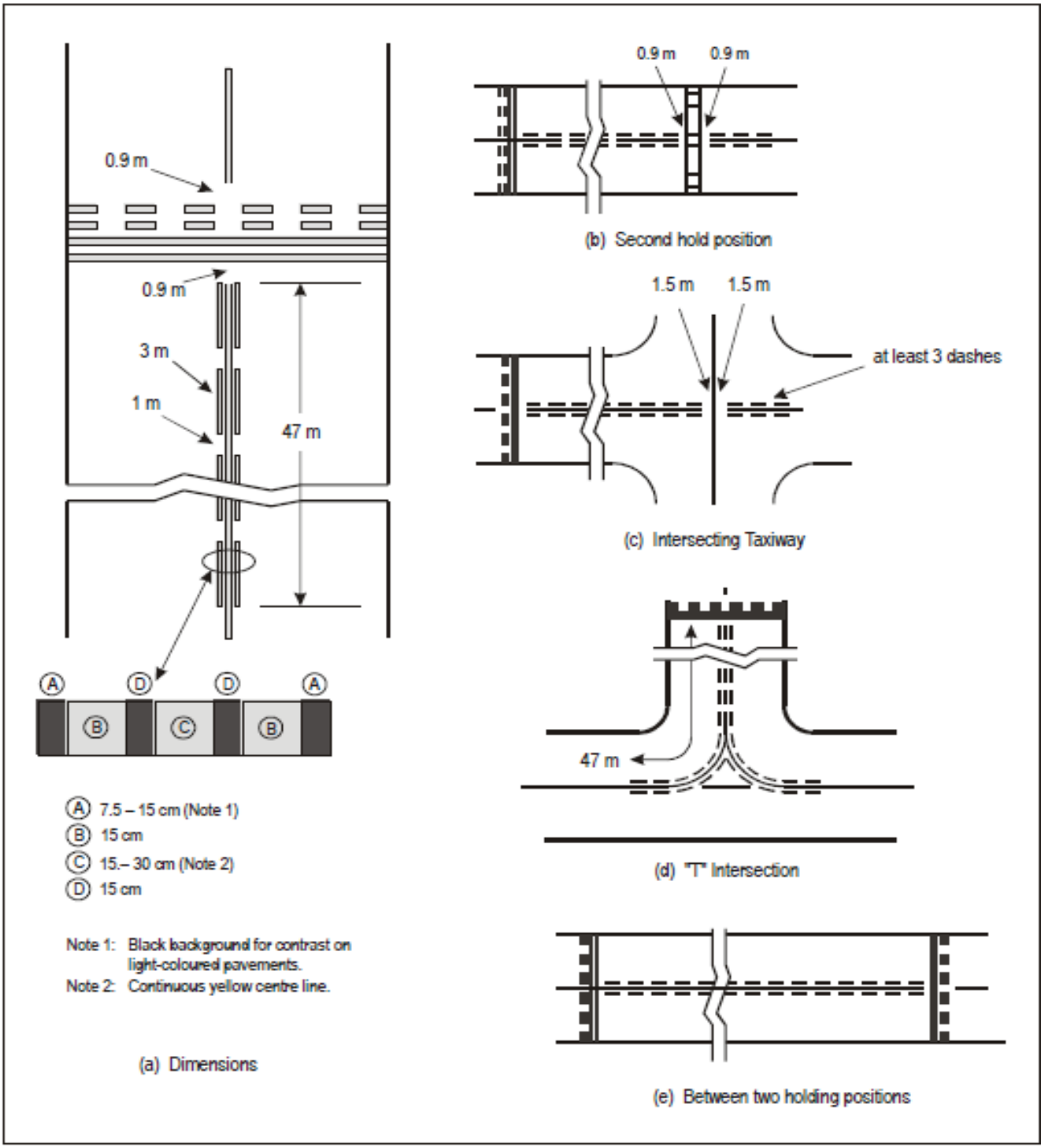


Diagram 5 – Enhanced taxiway centreline marking

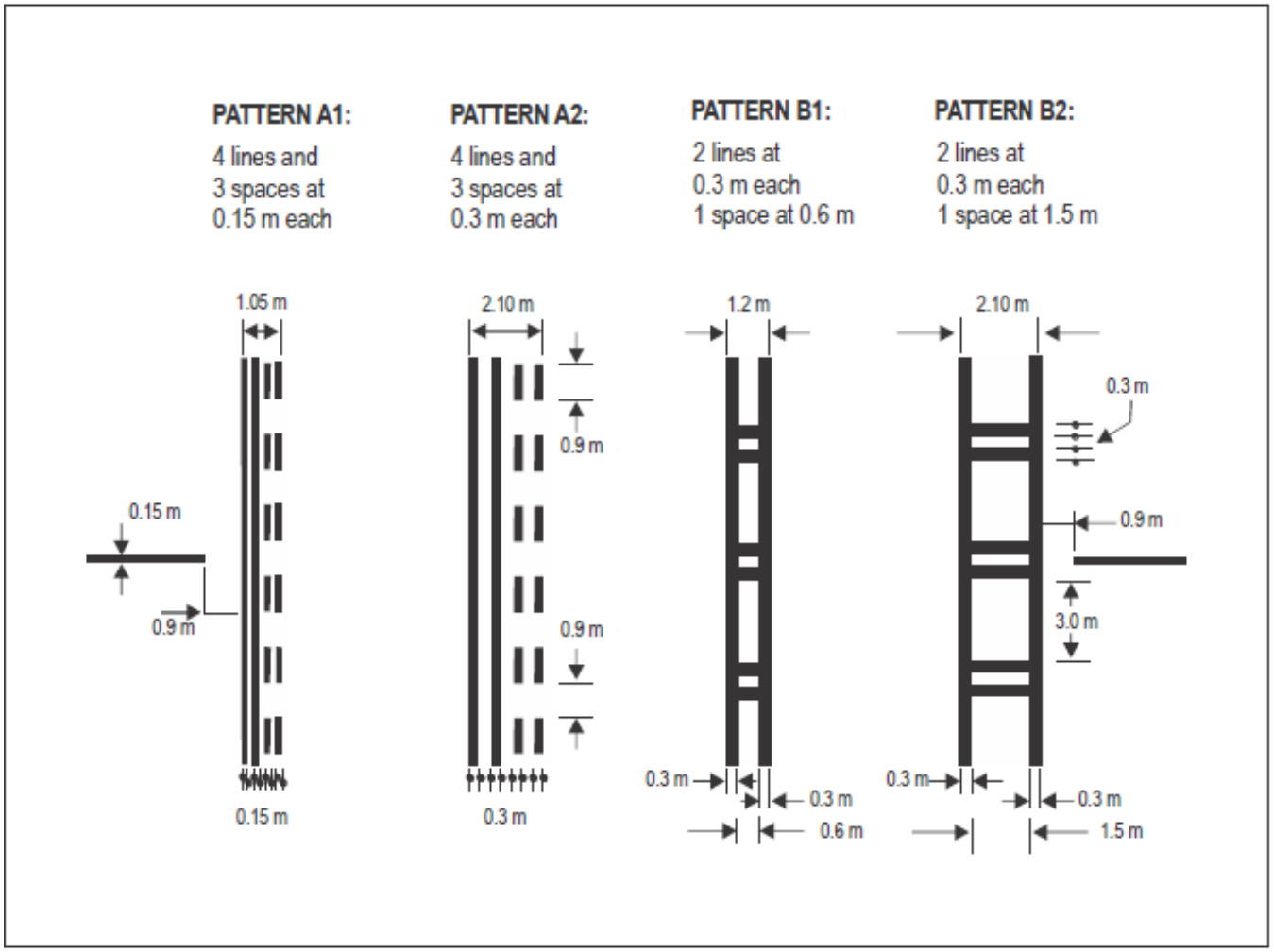


Diagram 6 Runway-holding position markings

(58) Aircraft stand markings, apron safety lines and VOR aerodrome checkpoint markings

1. Aircraft stand markings

(a) Clearance distances on aircraft stands

(i) A holder of an aerodrome licence shall ensure that aircraft stands comply with the following minimum clearances between an aircraft

entering or exiting the stand and any adjacent building, aircraft on another stand and other objects –

(aa) Code A and Code B aircraft shall have a clearance of 3m;

(bb) Code C aircraft shall have a clearance of 4.5m; and

(cc) Code D, E and F aircraft shall have a clearance of 5m.

(b) Aircraft Stand Markings Characteristics

(i) Aircraft stand markings shall include such elements as stand identification, lead-in line, turn bar, turning line, alignment bar, stop line and lead-out line, as are required by the parking configuration and to complement other parking aids.

(ii) Aircraft stand markings shall include such elements as stand identification, lead-in line, turn bar, turning line, alignment bar, stop line and lead-out line, as are required by the parking configuration and to complement other parking aids.

(iii) An aircraft stand identification (letter and/or number) shall be included in the lead-in line a short distance after the beginning of the lead-in line. The height of the identification shall be adequate to be readable from the cockpit of aircraft using the stand.

(iv) An aircraft stand identification letter and number shall be included in the lead-in line a short distance after the beginning of the lead-in line. The length of the identification shall be adequate to be readable from the cockpit of aircraft using the stand.

(v) Where two sets of aircraft stand markings are superimposed on each other in order to permit more flexible use of the apron and it is difficult to identify which stand marking shall be followed, or safety would be impaired if the wrong marking was followed, then identification of the aircraft for which each set of markings is intended shall be added to the stand identification.

(vi) Lead-in, turning and lead-out lines shall normally be continuous in length and have a width of not less than 15 cm. Where one or more sets of stand markings are superimposed on a stand marking, the lines shall be continuous for the most demanding aircraft and broken for other aircraft.

(vii) The curved portions of lead-in, turning and lead-out lines shall have radii appropriate to the most demanding aircraft type for which the markings are intended.

(viii) Where it is intended that an aircraft proceed in one direction only, arrows pointing in the direction to be followed shall be added as part of the lead-in and lead-out lines.

(ix) A turn bar shall be located at right angles to the lead-in line, abeam the left pilot position at the point of initiation of any intended turn. It shall have a length and width of not less than 6 m and 15 cm, respectively, and include an arrowhead to indicate the direction of turn.

(x) If more than one turn bar or stop line is required, they shall be coded.

(xi) An alignment bar shall be placed so as to be coincident with the extended centre line of the aircraft in the specified parking position and

visible to the pilot during the final part of the parking manoeuvre. It shall have a width of not less than 15cm.

(xii) A stop line shall be located at right angles to the alignment bar, abeam the left pilot position at the intended point of stop. It shall have a length and width of not less than 6m and 15cm, respectively.

2. Apron safety lines

(a) Apron safety lines shall be provided on a paved apron as required by the parking configurations and ground facilities.

(b) Apron safety lines shall be located so as to define the areas intended for use by ground vehicles and other aircraft servicing equipment in order to provide safe separation from aircraft.

(c) Apron safety lines shall include such elements as wing tip clearance lines and service road boundary lines as required by the parking configurations and ground facilities.

(d) An apron safety line shall be continuous in length and at least 10cm in width.

3. VOR aerodrome checkpoint markings

(a) When a VOR aerodrome checkpoint is established, it shall be indicated by a VOR aerodrome checkpoint marking.

(b) A VOR aerodrome checkpoint marking shall be centred on the spot at which an aircraft is to be parked to receive the correct VOR signal.

(c) A VOR aerodrome checkpoint marking shall consist of a circle 6 m in diameter and have a line width of 15 cm as indicated in Diagram 7A).

(d) When it is preferable for an aircraft to be aligned in a specific direction, a line shall be provided that passes through the centre of the circle on the desired azimuth. The line shall extend 6m outside the circle in the desired direction

of heading and terminate in an arrowhead. The width of the line should be 15cm as indicated in Diagram 7B.

(e) A VOR aerodrome checkpoint marking shall preferably be white in colour but shall differ from the colour used for the taxiway markings.

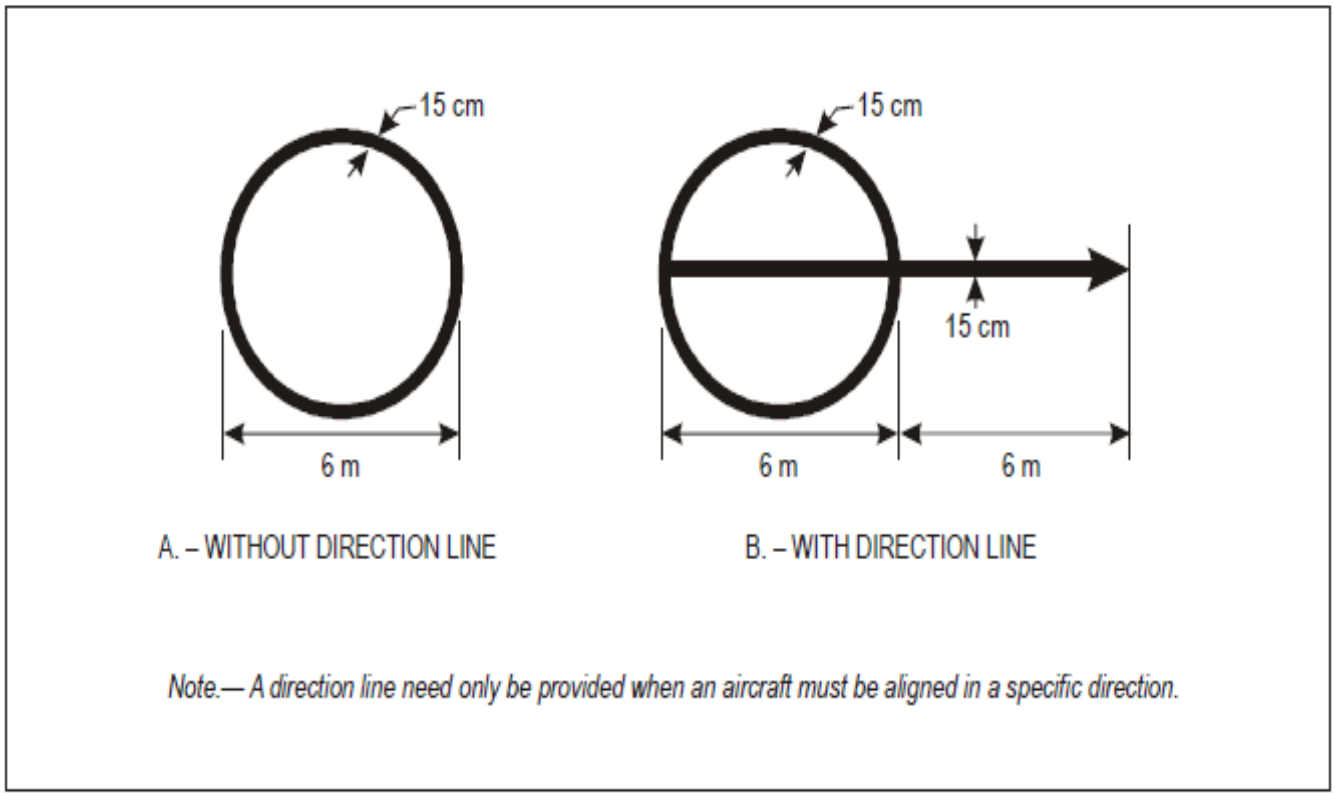


Diagram 7 VOR aerodrome checkpoint marking

(59) Road-holding position marking

(a) A road-holding position marking shall be provided at all paved road entrances to a runway.

(b) A road-holding position marking shall be provided at all road entrances to a runway, and it shall be located across the road at the holding position. The road-holding position marking shall be in accordance with the local road traffic regulations.

(60) Mandatory instruction marking

(a) Where it is impracticable to install a mandatory instruction sign in accordance with Technical Standard 139.10.52, a mandatory instruction marking shall be provided on the surface of the pavement.

(b) Where operationally required, such as on taxiways exceeding 60 m in width, or to assist in the prevention of a runway incursion, a mandatory instruction sign shall be supplemented by a mandatory instruction marking.

(c) The character length shall be 4m for inscriptions where the code letter is C, D, E or F, and 2m where the code letter is A or B.

(d) The background shall be rectangular and extend a minimum of 0.5m laterally and vertically beyond the extremities of the inscription.

(e) A “NO ENTRY” marking shall consist of an instruction in white reading NO entry on a red background.

(f) Where there is insufficient contrast between marking and the pavement surface, the mandatory instruction marking shall include an appropriate border, preferably white or black.

(61) Information marking

(a) Where an information sign would normally be installed and is impractical to install, as determined by the appropriate authority, an information marking shall be displayed on the surface of the pavement.

(b) Where operationally required, an information sign shall be supplemented by an information marking.

(c) An information location or direction marking shall be displayed prior to and following complex taxiway intersections and where operational experience has indicated the addition of a taxiway location marking could assist flight crew with ground navigation.

(d) An information location marking shall be displayed on the pavement surface at regular intervals along taxiways of great length.

(e) The information marking shall be displayed across the surface of the taxiway or apron where necessary and positioned so as to be legible from the cockpit of an approaching aircraft.

(f) The character length shall be 4m.

(62) Lights

(a) Elevated approach lights

Elevated approach lights and their supporting structures shall be frangible except that, in that portion of the approach lighting system beyond 300m from the threshold –

(aa) where the height of a supporting structure exceeds 12m, the frangibility requirement shall apply to the top 12m only; and

(bb) where a supporting structure is surrounded by non-frangible objects, only that part of the structure that extends above the surrounding objects shall be frangible.

(b) When an approach light fixture or supporting structure is not in itself sufficiently conspicuous, it shall be suitably marked.

(63) Elevated lights

Elevated runway and taxiway lights shall be frangible, and their height shall be sufficiently low to preserve clearance for propellers and for the engine pods of jet aircraft.

(64) Surface lights

Light fixtures inserted in the surface of runways, taxiways, and aprons shall be so designed and fitted as to withstand being run over by the wheels of an aircraft without damage either to the aircraft or to the lights themselves.

(65) Light intensity and control

(a) The intensity of runway lighting shall be adequate for the minimum conditions of visibility and ambient light in which use of the runway is intended, and compatible with that of the nearest section of the approach lighting system when provided;

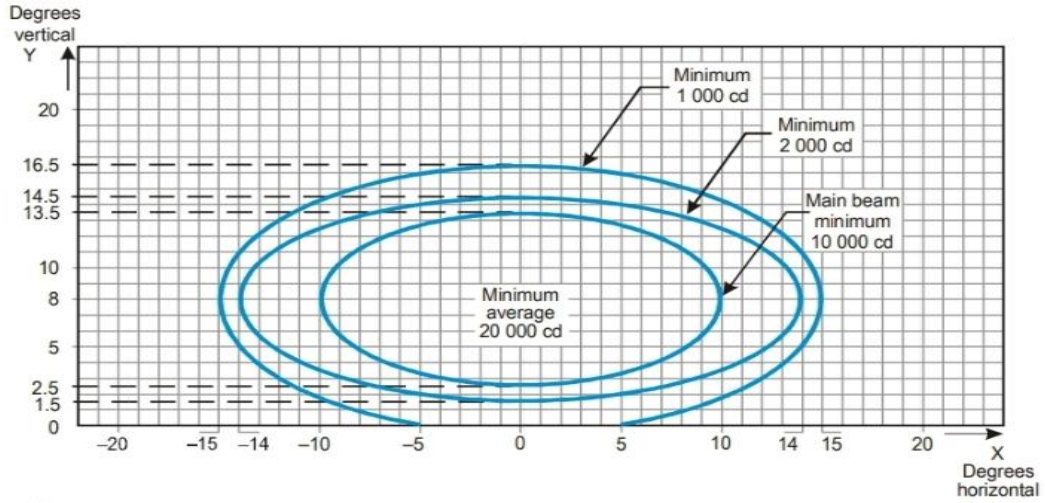
(b) A suitable intensity control shall be incorporated to allow for adjustment of the light intensity to meet the prevailing conditions; and

(c) Separate intensity controls other suitable methods shall be provided to ensure that the following systems, when installed, can be operated at compatible intensities –

(i) approach lighting system;
(ii) runway edge lights;
(iii) runway threshold lights;
(iv) runway end lights;
(v) runway centre line lights;
(vi) runway touchdown zone lights; and

(vii) taxiway centre line lights.

(d) On the perimeter of and within the ellipse defining the main beam in diagrams 3 to 13 the maximum light intensity value shall not be greater than three times the minimum light intensity value measured in accordance with diagrams 3 to 14:



Notes:

1. Curves calculated on formula $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$

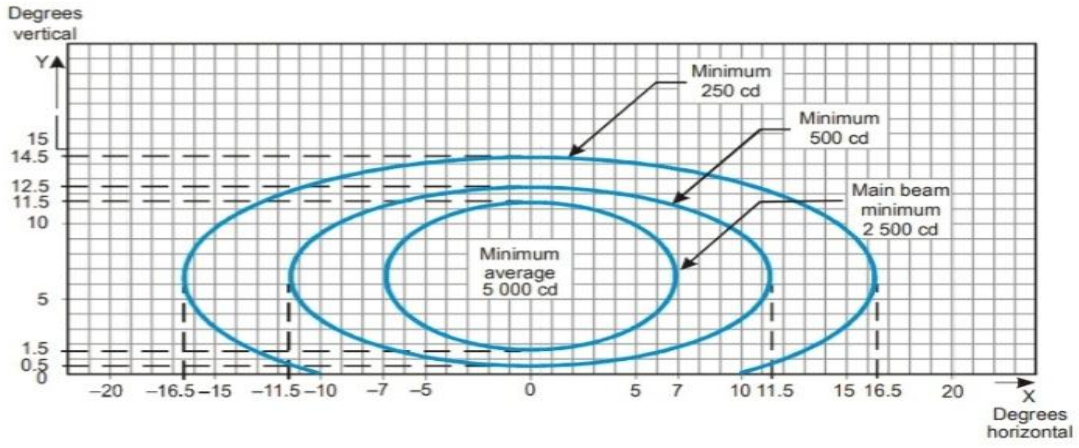
a	10	14	15
b	5.5	6.5	8.5

2. Vertical setting angles of the lights shall be such that the following vertical coverage of the main beam will be met:

distance from threshold	vertical main beam coverage
threshold to 315 m	0° — 11°
316 m to 475 m	0.5° — 11.5°
476 m to 640 m	1.5° — 12.5°
641 m and beyond	2.5° — 13.5° (as illustrated above)

3. Lights in crossbars beyond 22.5 m from the centre line shall be toed-in 2 degrees. All other lights shall be aligned parallel to the centre line of the runway.

Diagram 3



Notes:

1. Curves calculated on formula $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

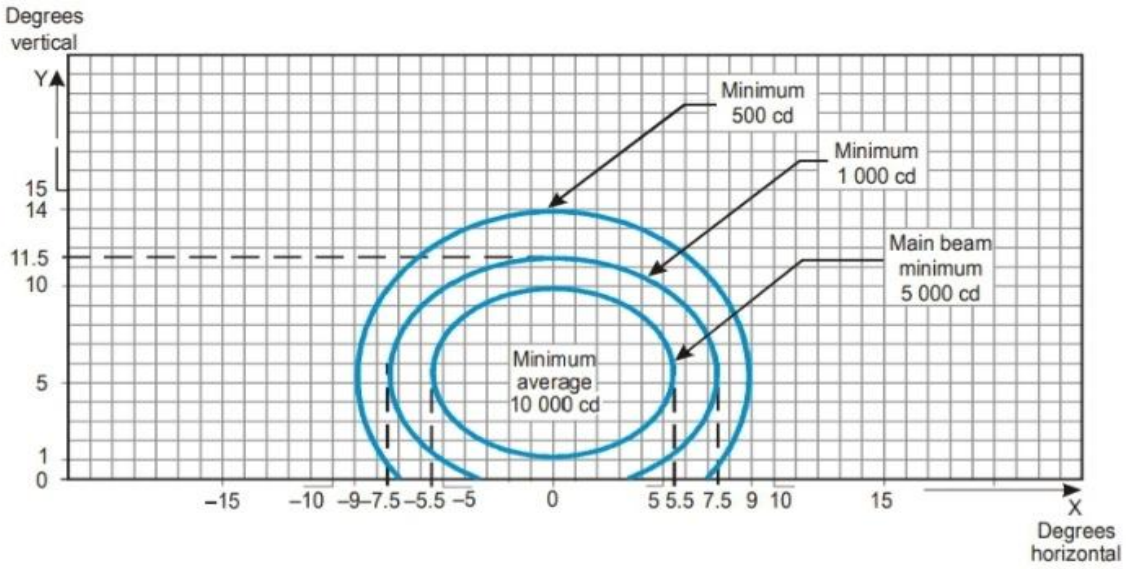
a	7.0	11.5	16.5
b	5.0	6.0	8.0

2. Toe-in 2 degrees

3. Vertical setting angles of the lights shall be such that the following vertical coverage of the main beam will be met:

distance from threshold	vertical main beam coverage
threshold to 115 m	0.5° — 10.5°
116 m to 215 m	1° — 11°
216 m and beyond	1.5° — 11.5° (as illustrated above)

Diagram 4



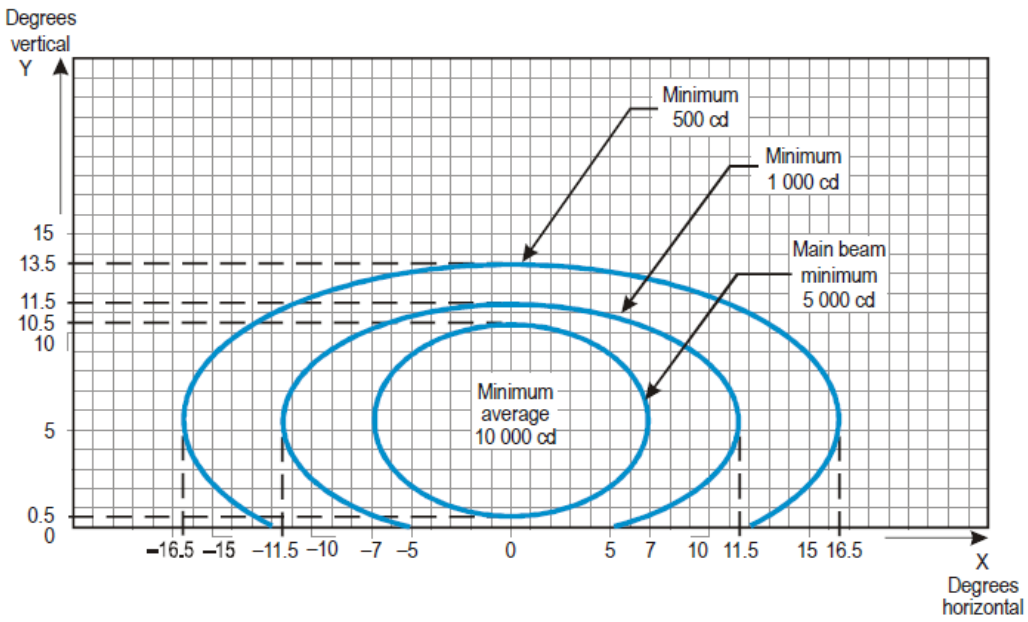
Notes:

1. Curves calculated on formula $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

a	5.5	7.5	9.0
b	4.5	6.0	8.5

2. Toe-in 3.5 degrees

Diagram 5



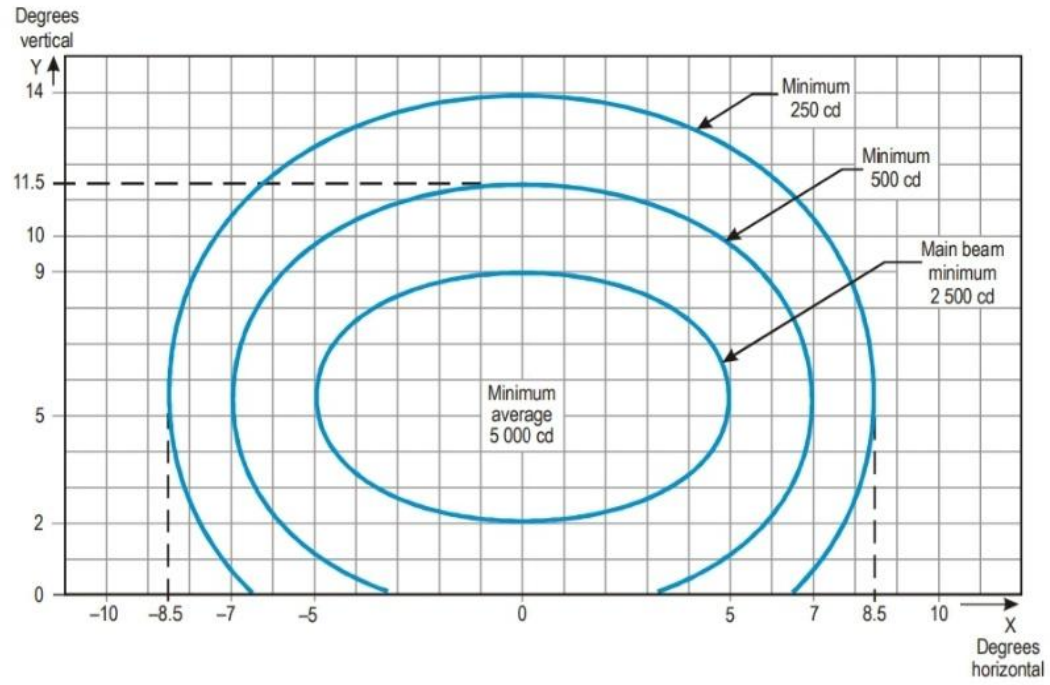
Notes:

1. Curves calculated on formula $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$

a	7.0	11.5	16.5
b	5.0	6.0	8.0

2. Toe-in 2 degrees

Diagram 6



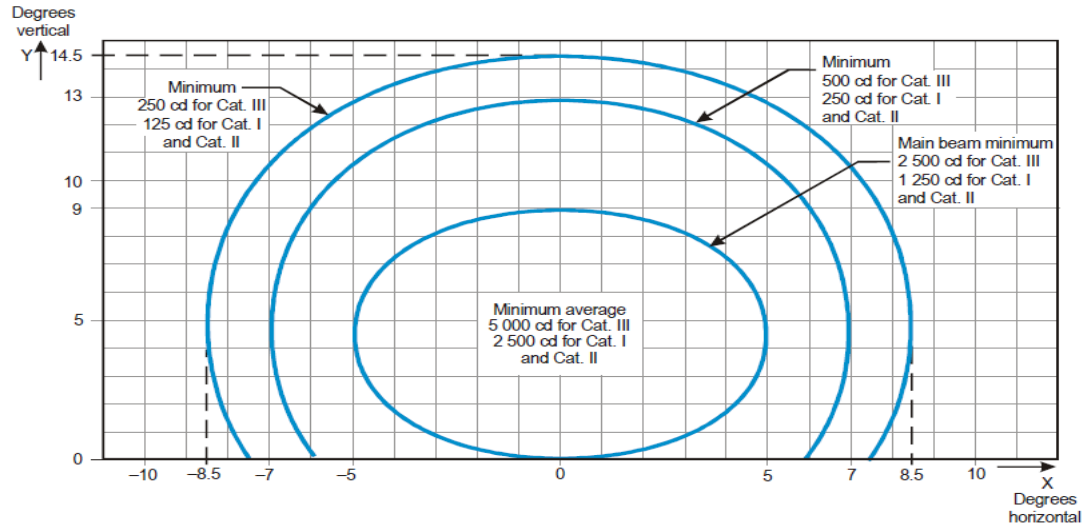
Notes:

1. Curves calculated on formula $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$

a	5.0	7.0	8.5
b	3.5	6.0	8.5

2. Toe-in 4 degrees

Diagram 7



Notes:

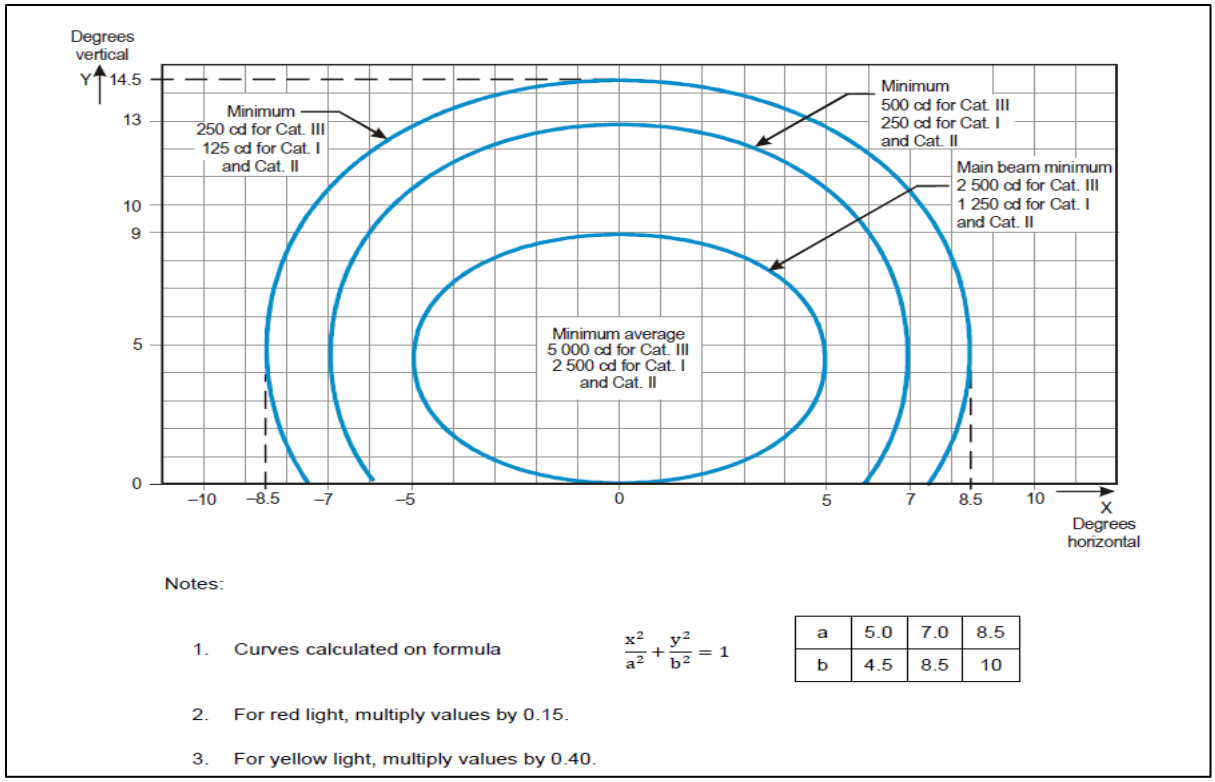
1. Curves calculated on formula $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

a	5.0	7.0	8.5
b	4.5	8.5	10

2. For red light, multiply values by 0.15.

3. For yellow light, multiply values by 0.40.

Diagram 8



Notes:

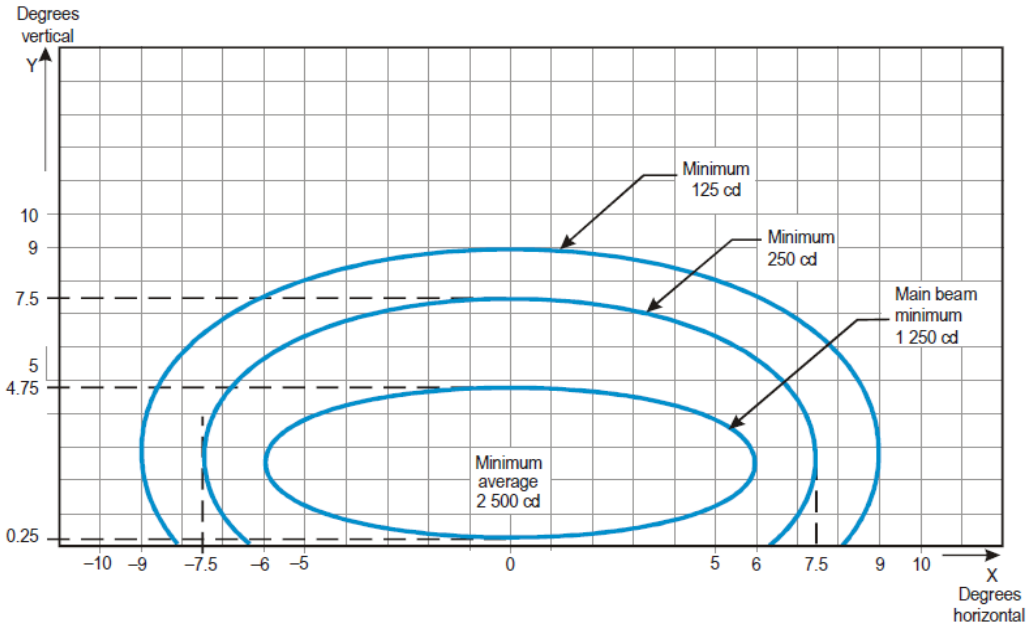
1. Curves calculated on formula $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

a	5.0	7.0	8.5
b	4.5	8.5	10

2. For red light, multiply values by 0.15.

3. For yellow light, multiply values by 0.40.

Diagram 9

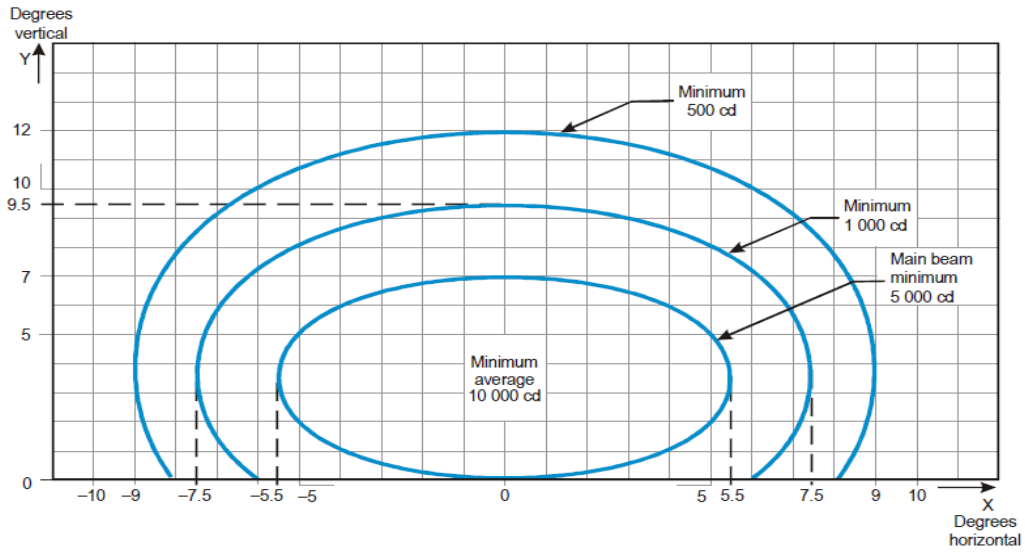


Notes:

1. Curves calculated on formula $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$

a	6.0	7.5	9.0
b	2.25	5.0	6.5

Diagram 10



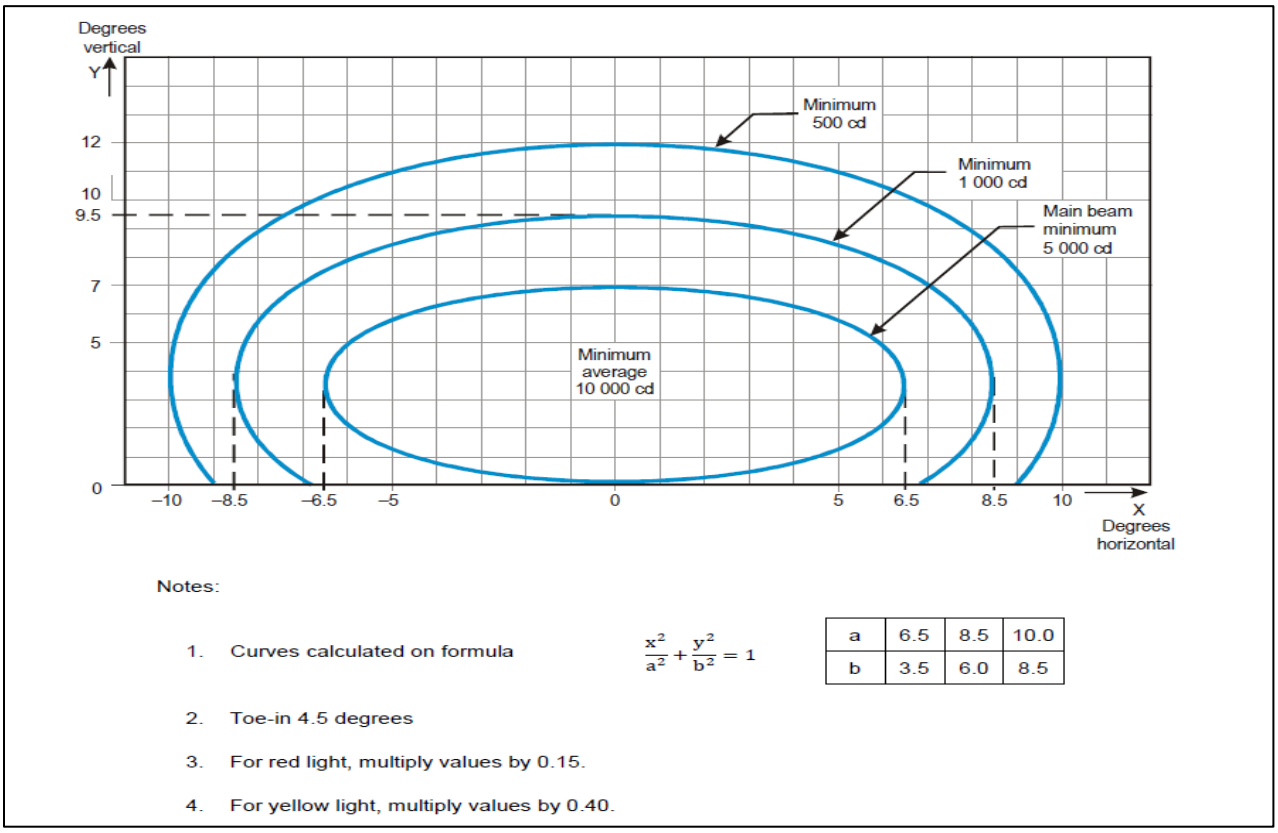
Notes:

1. Curves calculated on formula $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

a	5.5	7.5	9.0
b	3.5	6.0	8.5

2. Toe-in 3.5 degrees
3. For red light, multiply values by 0.15.
4. For yellow light, multiply values by 0.40.

Diagram 11



Notes:

1. Curves calculated on formula $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

a	6.5	8.5	10.0
b	3.5	6.0	8.5

2. Toe-in 4.5 degrees
3. For red light, multiply values by 0.15.
4. For yellow light, multiply values by 0.40.

Diagram 12

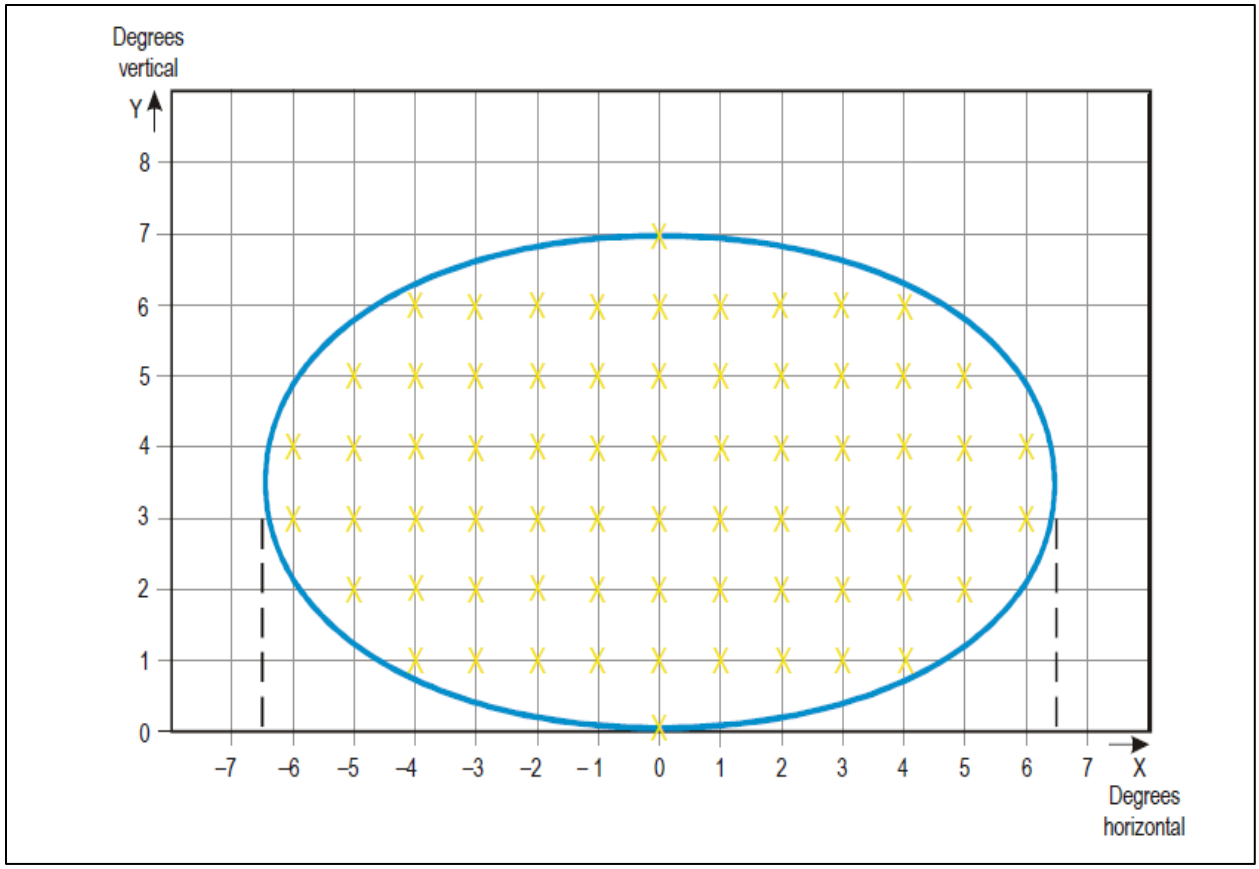
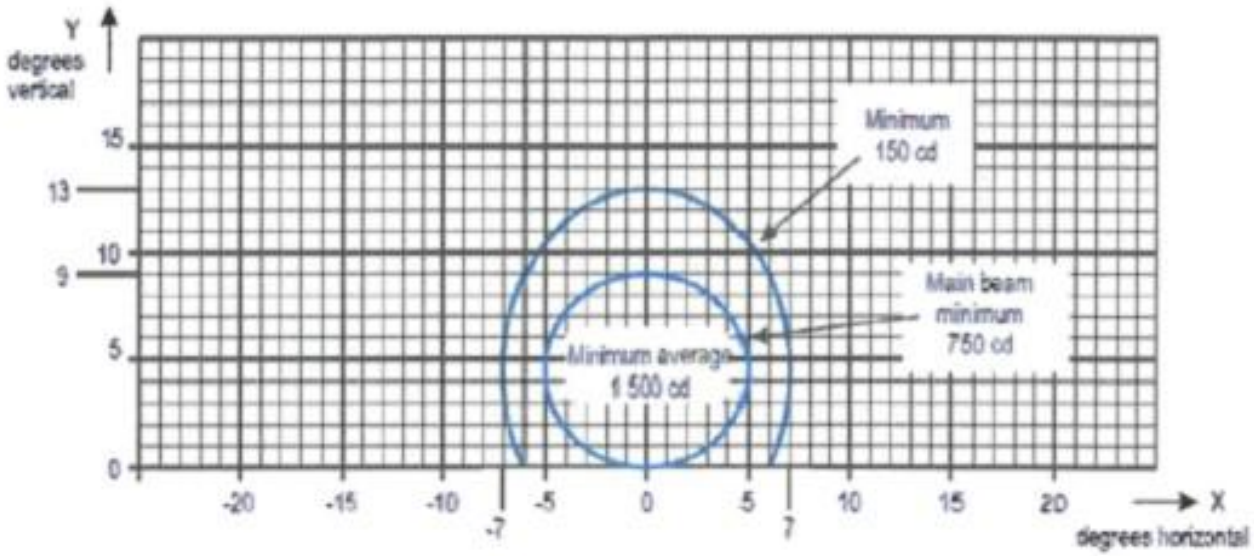

Degrees
vertical
Y
8
7
6
5
4
3
2
1
0
–7
–6
–5
–4
–3
–2
–1
0
1
2
3
4
5
6
7
X
Degrees
horizontal

Diagram 13



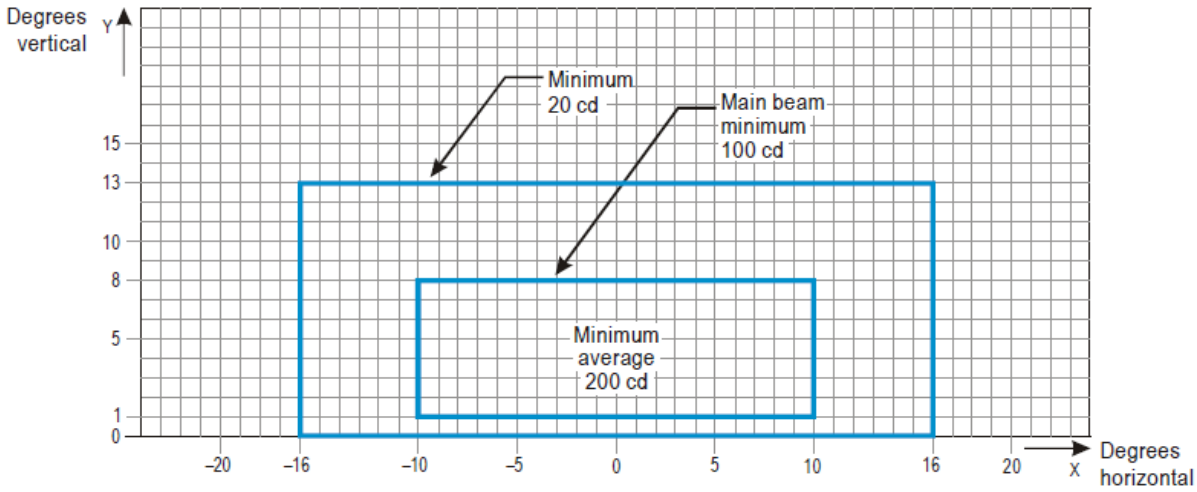
Notes:

1. Curves calculated on formula $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$

a	5.0	7.0
b	4.5	8.5

Diagram 14

(e) On the perimeter of and within the rectangle defining the main beam in diagrams 15 to 23, the maximum light intensity value shall not be greater than three times the minimum light intensity value measured in accordance with diagrams 15 to 24.



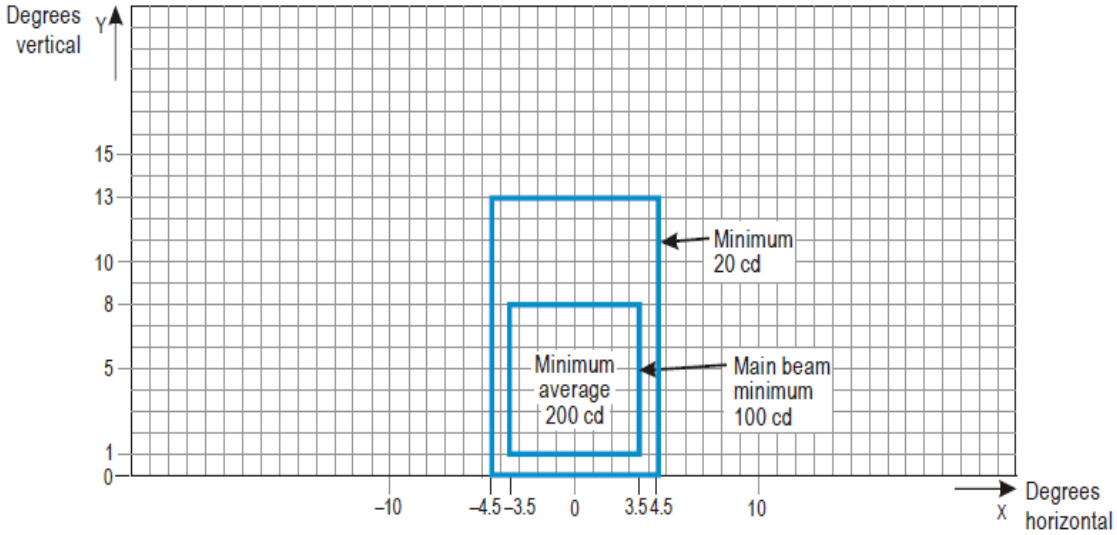
Notes:

1. These beam coverages allow for displacement of the cockpit from the centre line up to distances of the order of 12 m and are intended for use before and after curves.

2. See collective notes for Figures A2-12 to A2-21.

3. Increased intensities for enhanced rapid exit taxiway centre line lights as recommended in 5.3.16.9 are four times the respective intensities in the figure (i.e. 800 cd for minimum average main beam).

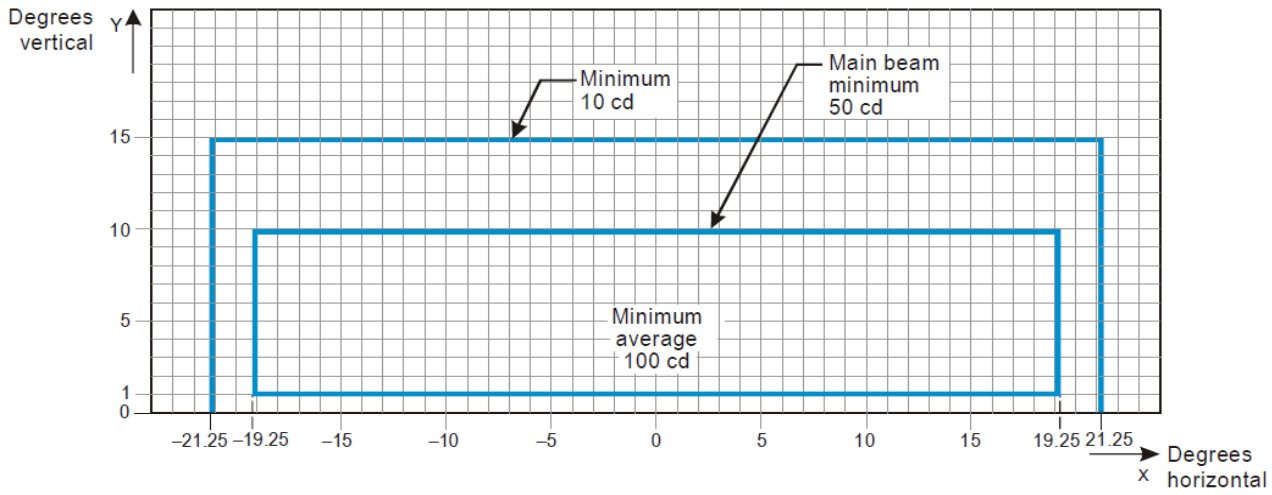
Diagram 15



Notes:

1. These beam coverages are generally satisfactory and cater for a normal displacement of the cockpit from the centre line of approximately 3 m.

Diagram 16

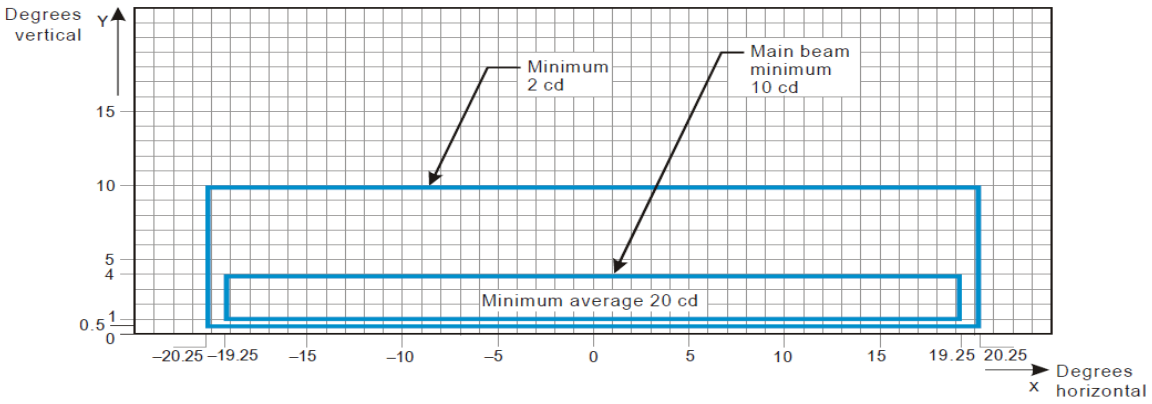


Notes:

1. Lights on curves to be toed-in 15.75 degrees with respect to the tangent of the curve. This does not apply to runway entrance lights (RELs)

2. Increased intensities for RELs shall be twice the specified intensities, i.e., minimum 20 cd, main beam minimum 100 cd and minimum average 200 cd.

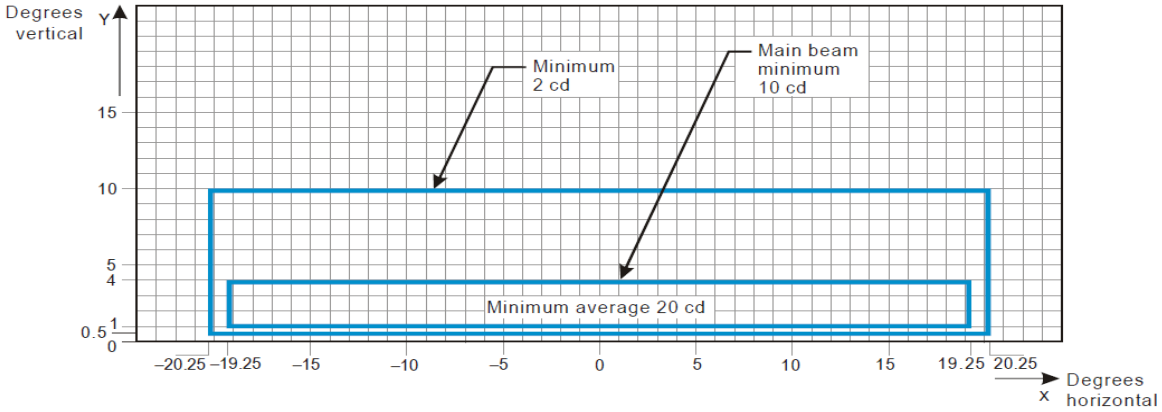
Diagram 17



Notes:

1. Lights on curves to be toed-in 15.75 degrees with respect to the tangent of the curve.
2. At locations where high background luminance is usual and where deterioration of light output resulting from dust, snow and local contamination is a significant factor, the cd-values should be multiplied by 2.5.
3. These beam coverages allow for displacement of the cockpit from the centre line up to distances of the order of 12 m as could occur at the end of curves.

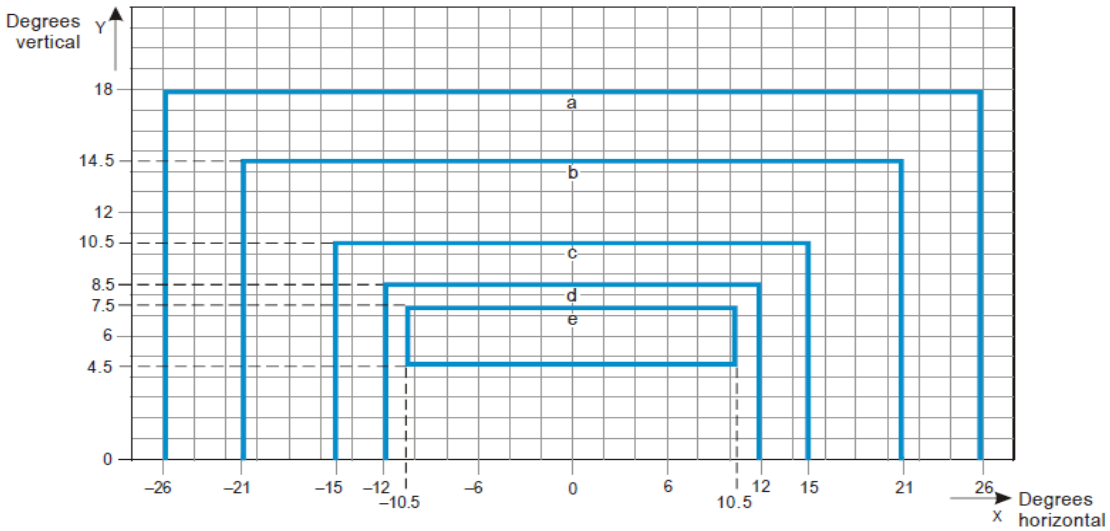
Diagram 18



Notes:

1. Lights on curves to be toed-in 15.75 degrees with respect to the tangent of the curve.
2. At locations where high background luminance is usual and where deterioration of light output resulting from dust, snow and local contamination is a significant factor, the cd-values should be multiplied by 2.5.
3. These beam coverages allow for displacement of the cockpit from the centre line up to distances of the order of 12 m as could occur at the end of curves.

Diagram 19

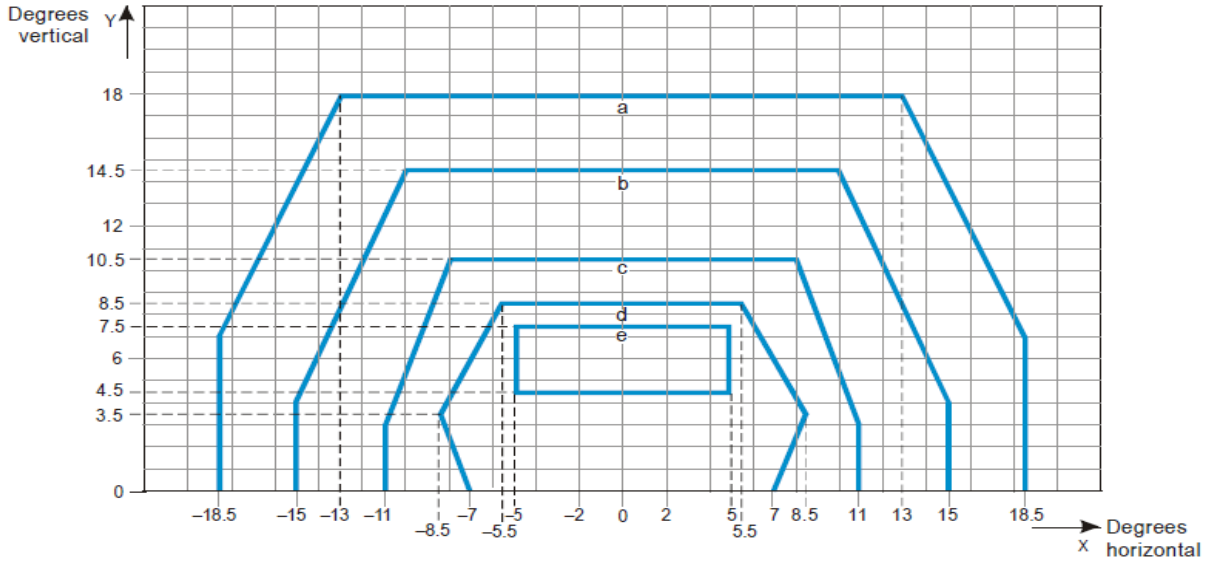


Curve	a	b	c	d	e
Intensity (cd)	8	20	100	450	1 800

Notes:

1. These beam coverages allow for displacement of the cockpit from the centre line up to distances of the order of 12 m and are intended for use before and after curves.

Diagram 20

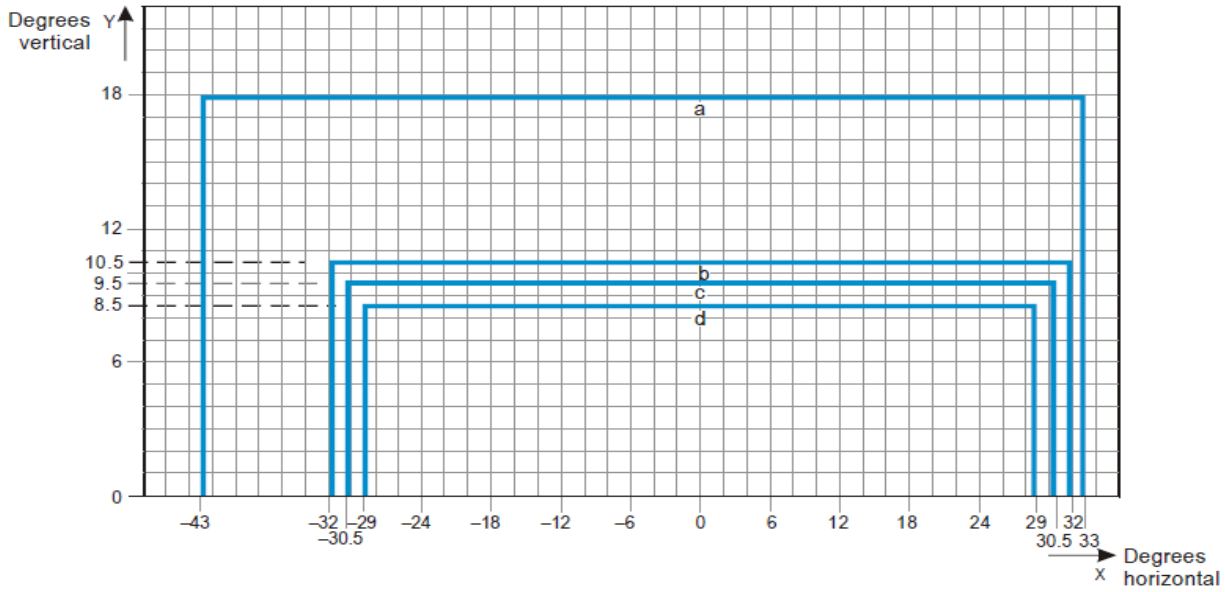


Curve	a	b	c	d	e
Intensity (cd)	8	20	100	450	1 800

Notes:

1. These beam coverages are generally satisfactory and cater for a normal displacement of the cockpit corresponding to the outer main gear wheel on the taxiway edge.

Diagram 21

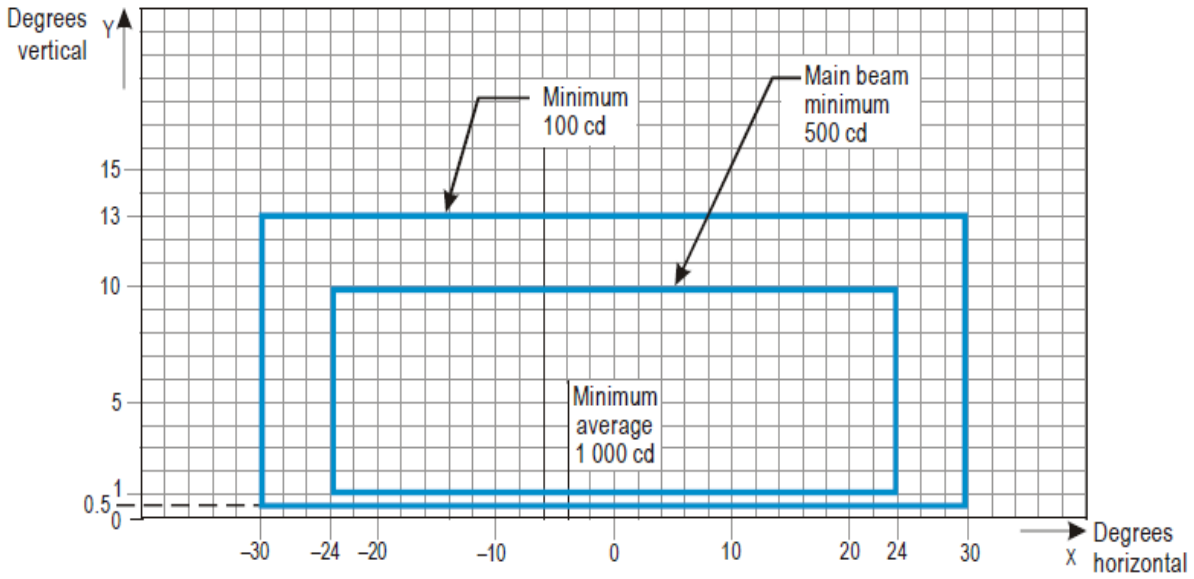


Curve	a	b	c	d
Intensity (cd)	8	100	200	400

Notes:

1. Lights on curves to be toed-in 17 degrees with respect to the tangent of the curve.

Diagram 22



Notes:

1. Although the lights flash in normal operation, the light intensity is specified as if the lights were fixed for incandescent lamps.

Diagram 23

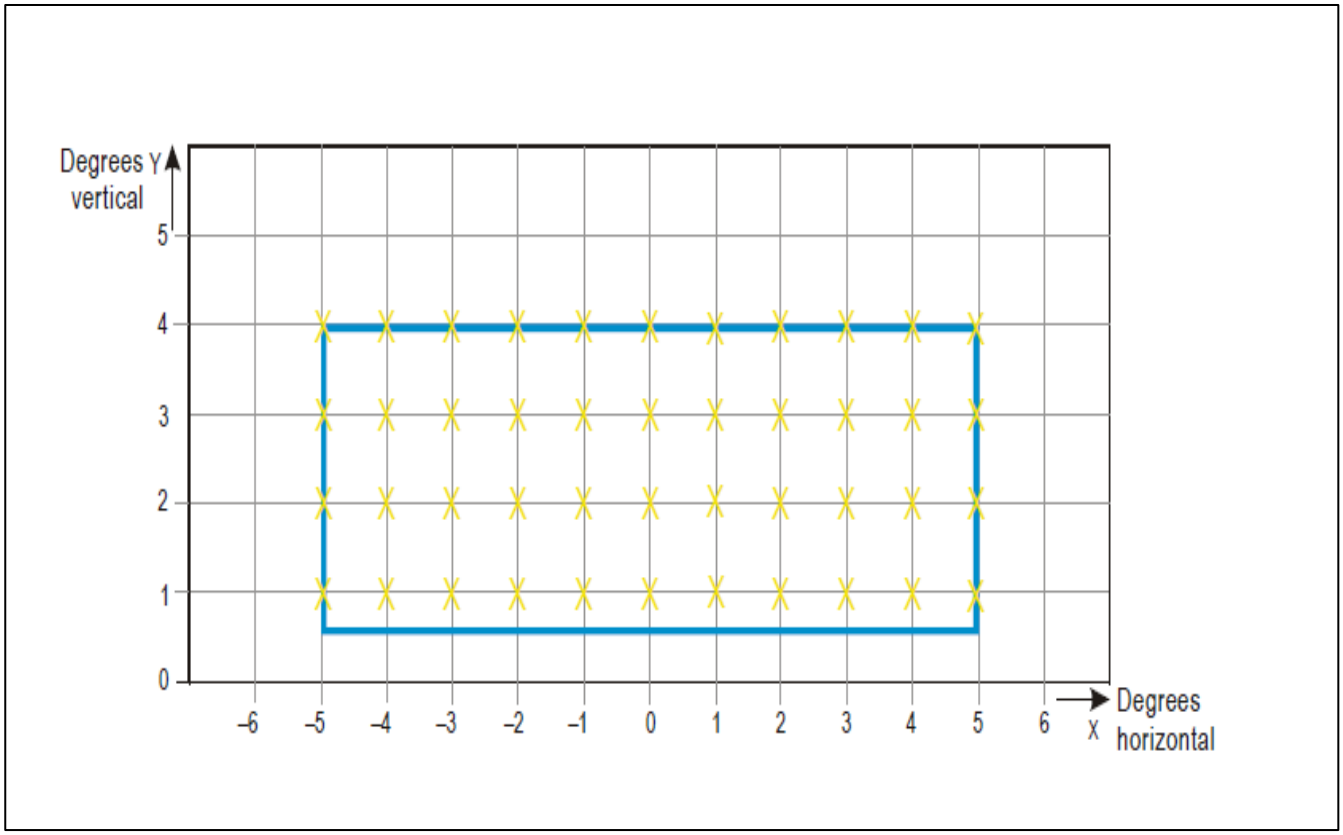


Diagram 24

(66) Aerodrome beacon

(a) An aerodrome beacon shall be provided at an aerodrome intended for use at night if one or more of the following conditions exist –

(i) aircraft navigate predominantly by visual means;

(ii) reduced visibilities are frequent;

(iii) it is difficult to locate the aerodrome from the air due to surrounding lights or terrain; and

(iv) where aerodromes are in close proximity, to avoid confusion, coordination needs to be effected to distinguish between the various aerodromes.

(67) Approach lighting systems

(a) Where physically practicable, a simple approach lighting system shall be provided to serve a non-precision approach runway, except when the runway is used only in conditions of good visibility or sufficient guidance is provided by other visual aids;

(b) Where physically practicable, a precision approach category I lighting system shall be provided to serve a precision approach runway category I; and

(c) A precision approach category II and III lighting system shall be provided to serve a precision approach runway category II or III.

(68) Visual approach slope indicator systems

(a) A visual approach slope indicator system shall be provided to serve the approach to a runway whether or not the runway is served by other visual approach aids or by non-visual aids, where one or more of the following conditions exist –

(i) the runway is used by turbojet, turbofan, or other aircraft with similar approach guidance requirements;

(ii) the pilot of any type of aircraft may have difficulty in judging the approach due to –

(aa) inadequate visual guidance such as is experienced during an approach over water or featureless terrain by day or in the absence of sufficient extraneous lights in the approach area by night; or

(bb) misleading information produced by deceptive surrounding terrain or runway slopes;

(b) The presence of objects in the approach area may involve serious hazard if an aircraft descends below the normal approach path, particularly if there are no non-visual or other visual aids to give warning of such objects.

(c) Physical conditions at either end of the runway present a serious hazard in the event of an aircraft undershooting or overrunning the runway.

(d) Terrain or prevalent meteorological conditions are such that the aircraft may be subjected to unusual turbulence during approach.

(e) PAPI, T-VASIS or AT-VASIS shall be provided where the aerodrome reference code number is 3 or 4; when 1 or more of the conditions specified in paragraphs (a) to (e) exist.

(f) PAPI or APAPI shall be provided where an aerodrome reference code number is 1 or 2; when one or more of the conditions specified in paragraphs (a) to (e) exist.

(69) Obstacle protection surface

(a) An obstacle protection surface shall be established when it is intended to provide a visual approach slope indicator system;

(b) New objects or extensions of existing objects shall not be permitted above an obstacle protection surface except when the new object or extension shall be shielded by an existing immovable object;

(c) Existing objects above an obstacle protection surface shall be removed except when the object is shielded by an existing immovable object, or an aeronautical study determines that the object shall not adversely affect the safety of operations of an aircraft; and

(d) Where an aeronautical study indicates that an existing object extending above an obstacle protection surface could adversely affect the safety of

operations of aircraft one or more of the following measures shall be taken –

(i) suitably raise the approach slope of the visual approach slope indicator system;

(ii) reduce the azimuth spread of the visual approach slope indicator system so that the object is outside the confines of the beam;

(iii) displace the axis of the visual approach slope indicator system and its associated obstacle protection surface by no more than 5 degrees;

(iv) suitably displace the runway threshold; and

(v) where paragraph (d) is found to be impracticable, suitably displace the visual approach slope indicator system upwind of the runway threshold to provide an increase in threshold crossing height equal to the height of the object penetration.

(70) Runway threshold and wing bar lights

(a) **Runway Edge Lights**

(i) Runway edge lights shall be provided for a runway intended for use at night or for a precision approach runway intended for use by day or night.

(ii) Runway edge lights shall be provided on a runway intended for take-off with an operating minimum below an RVR of the order of 800 m by day.

(iii) Runway edge lights shall be placed along the full length of the runway and shall be in two parallel rows equidistant from the centre line.

(iv) Runway edge lights shall be placed along the edges of the area declared for use as the runway or outside the edges of the area at a distance of not more than 3m.

(v) Where the width of the area which is declared as runway exceeds 60m, the distance between the rows of lights shall be determined considering the nature of the operations, the light distribution characteristics of the runway edge lights, and other visual aids serving the runway.

(vi) The lights shall be uniformly spaced in rows at intervals of not more than 60m for an instrument runway, and at intervals of not more than 100m for a non-instrument runway. The lights on opposite sides of the runway axis shall be on lines at right angles to that axis. At intersections of runways, lights may be spaced irregularly or omitted, provided that adequate guidance remains available to a pilot.

(vii) Runway edge lights shall be fixed lights showing variable white, except that –

(aa) in the case of a displaced threshold, the lights between the beginning of the runway and the displaced threshold shall show red in the approach direction; and

(bb) a section of the lights 600m or one-third of the runway length, whichever is the less, at the remote end of the runway from the end at which the take-off run is started, may show yellow.

(viii) The runway edge lights shall show at all angles in azimuth necessary to provide guidance to a pilot landing or taking off in either direction. When the runway edge lights are intended to provide circling guidance, they shall show at all angles in azimuth.

(ix) In all angles of azimuth required in subparagraph (viii), runway edge lights shall show at angles up to 15° above the horizontal with an intensity adequate for the conditions of visibility and ambient light in which use of the runway for take-off or landing is intended. In any case, the intensity shall be at least 50 cd except that at an aerodrome

without extraneous lighting, the intensity of the lights may be reduced to not less than 25 cd to avoid dazzling a pilot.

(x) Runway edge lights on a precision approach runway shall be in accordance with the specifications of diagram 11 and 12.

(b) **Runway End Lights**

(i) Runway end lights shall be placed on a line at right angles to the runway axis as near to the end of the runway as possible and, in any case, not more than 3m outside the end.

(ii) Runway end lighting shall consist of at least six lights. The lights shall be either –

(aa) equally spaced between the rows of runway edge lights; or

(bb) symmetrically disposed about the runway centre line in two groups with the lights uniformly spaced in each group and with a gap between the groups of not more than half the distance between the rows of runway edge lights.

(cc) for a precision approach runway category III, the spacing between runway end lights, except between the two innermost lights if a gap is used, shall not exceed 6m.

(dd) Runway end lights shall be fixed unidirectional lights showing red in the direction of the runway. The intensity and beam spread of the lights shall be adequate for the conditions of visibility and ambient light in which use of the runway is intended.

(bb) Runway end lights on a precision approach runway shall be in accordance with the specifications of diagram 10.

(71) Runway threshold and wing bar lights

(a) When a threshold is at the extremity of a runway, the threshold lights shall be placed in a row at right angles to the runway axis as near to the extremity of the runway as possible and, in any case, not more than 3m outside the extremity.

(b) When a threshold is displaced from the extremity of a runway, threshold lights shall be placed in a row at right angles to the runway axis at the displaced threshold.

(c) Threshold lighting shall consist of –

(i) on a non-instrument or non-precision approach runway, at least six lights;

(ii) on a precision approach runway category I, at least the number of lights that shall be required if the lights were uniformly spaced at intervals of 3m between the rows of runway edge lights; and

(iii) on a precision approach runway category II or III, lights uniformly spaced between the rows of runway edge lights at intervals of not more than 3m.

(72) Runway wing bar lights

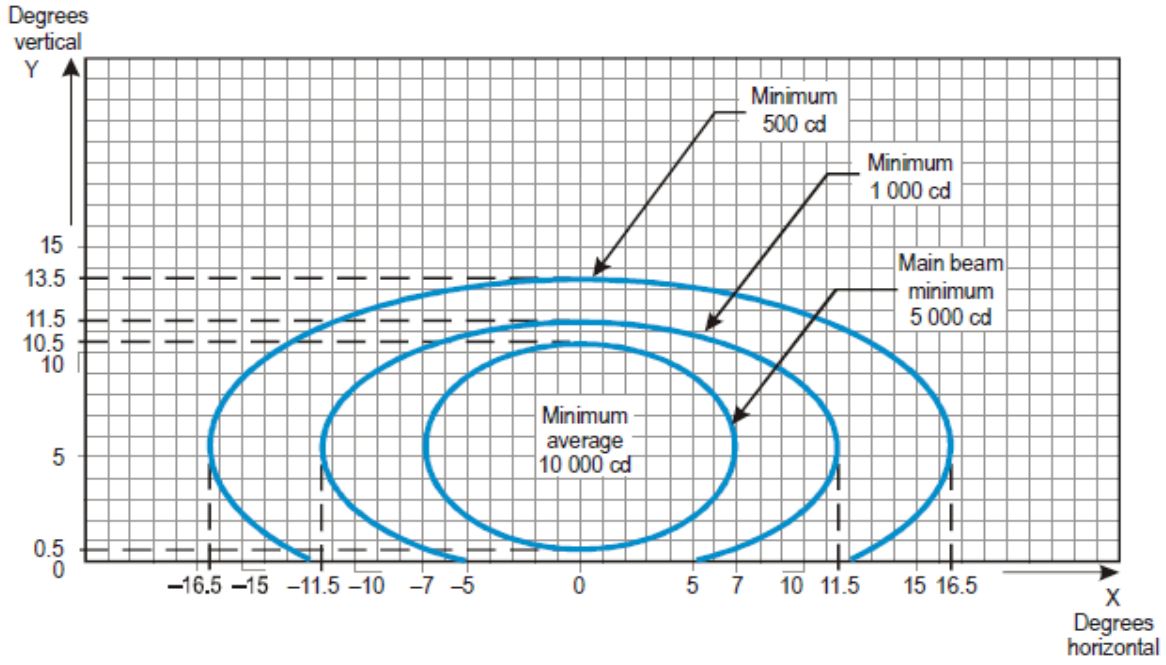
(a) Wing bar lights shall be provided on a non-instrument or non-precision approach runway where the threshold is displaced and runway threshold lights are required but are not provided.

(b) Wing bar lights shall be symmetrically disposed about the runway centre line at the threshold in two groups such as wing bars. Each wing bar shall be formed by at least five lights extending at least 10m outward from, and

at right angles to, the line of the runway edge lights, with the innermost light of each wing bar in the line of the runway edge lights.

(c) Runway threshold and wing bar lights shall be fixed unidirectional lights showing green in the direction of approach to the runway. The intensity and beam spread of the lights shall be adequate for the conditions of visibility and ambient light in which use of the runway is intended.

(d) Runway threshold lights on a precision approach runway shall be in accordance with the specifications for diagram 25 below –



Notes:

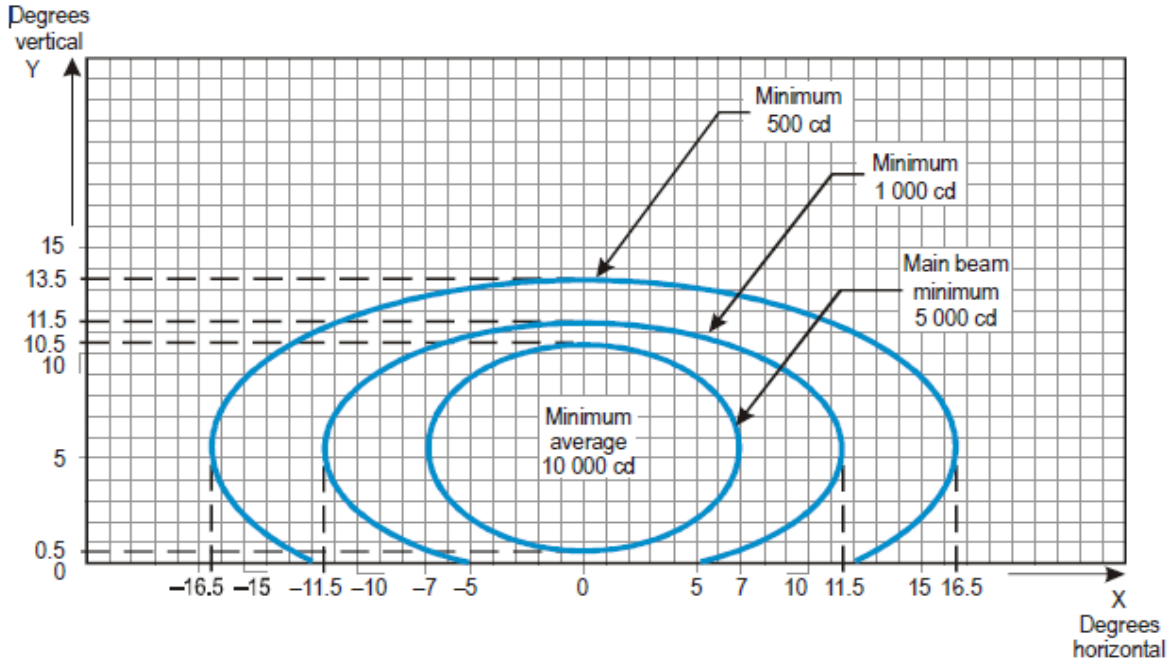
1. Curves calculated on formula $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$

a	7.0	11.5	16.5
b	5.0	6.0	8.0

2. Toe-in 2 degrees

Diagram 25

(e) Threshold wing bar lights on a precision approach runway shall be in accordance with the specifications of diagram 26:



Notes:

1. Curves calculated on formula $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$

a	7.0	11.5	16.5
b	5.0	6.0	8.0

2. Toe-in 2 degrees

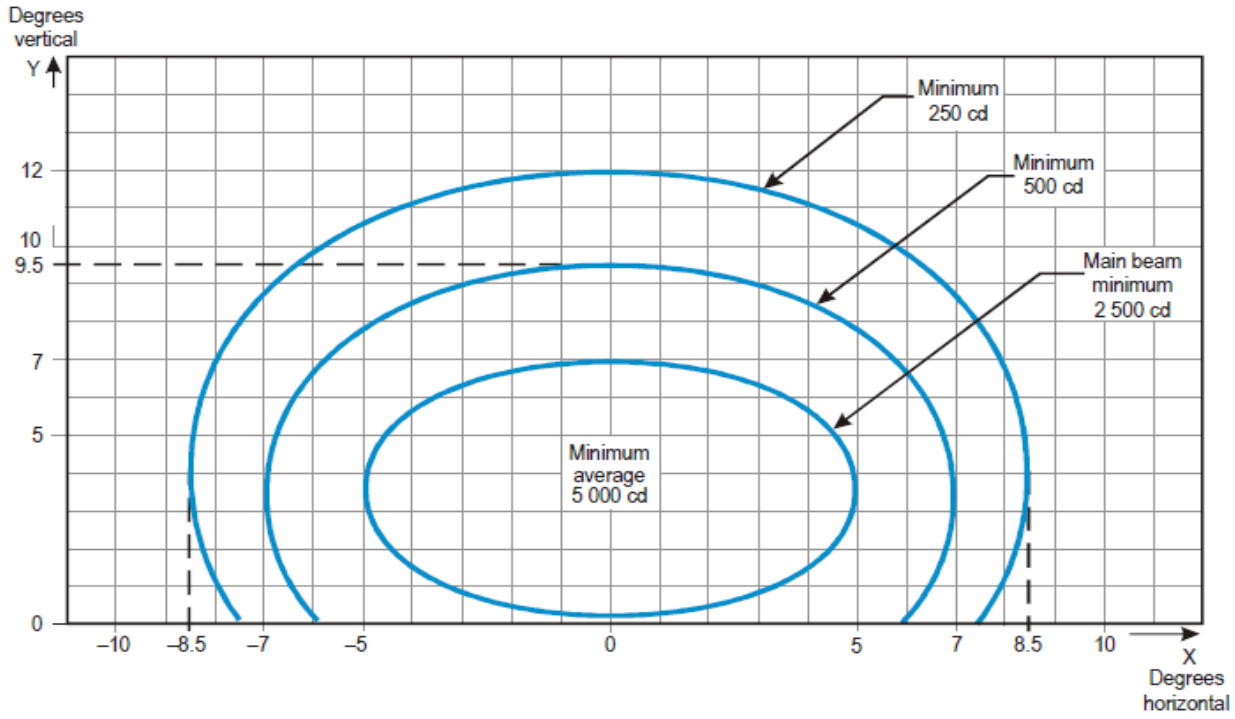
Diagram 26

(f) Runway centre line lights shall be located along the centre line of the runway, except that the lights may be uniformly offset to the same side of the runway centre line by not more than 60cm where it is not practicable to locate them along the centre line. The lights shall be located from the threshold to the end at longitudinal spacing approximately 15m.

(g) The runway is intended for use in runway visual range conditions of 350m or greater, the longitudinal spacing may be approximately 30m.

(h) Runway centre line lights shall be fixed lights showing variable white from the threshold to the point 900m from the runway end; alternate red and variable white from 900m to 300m from the runway end; and red from 300m to the runway end, except that for runways less than 1 800m in length, the alternate red and variable white lights shall extend from the midpoint of the runway usable for landing to 300m from the runway end.

(i) Runway centre line lights shall be in accordance with the specifications of diagrams 27 or 28.



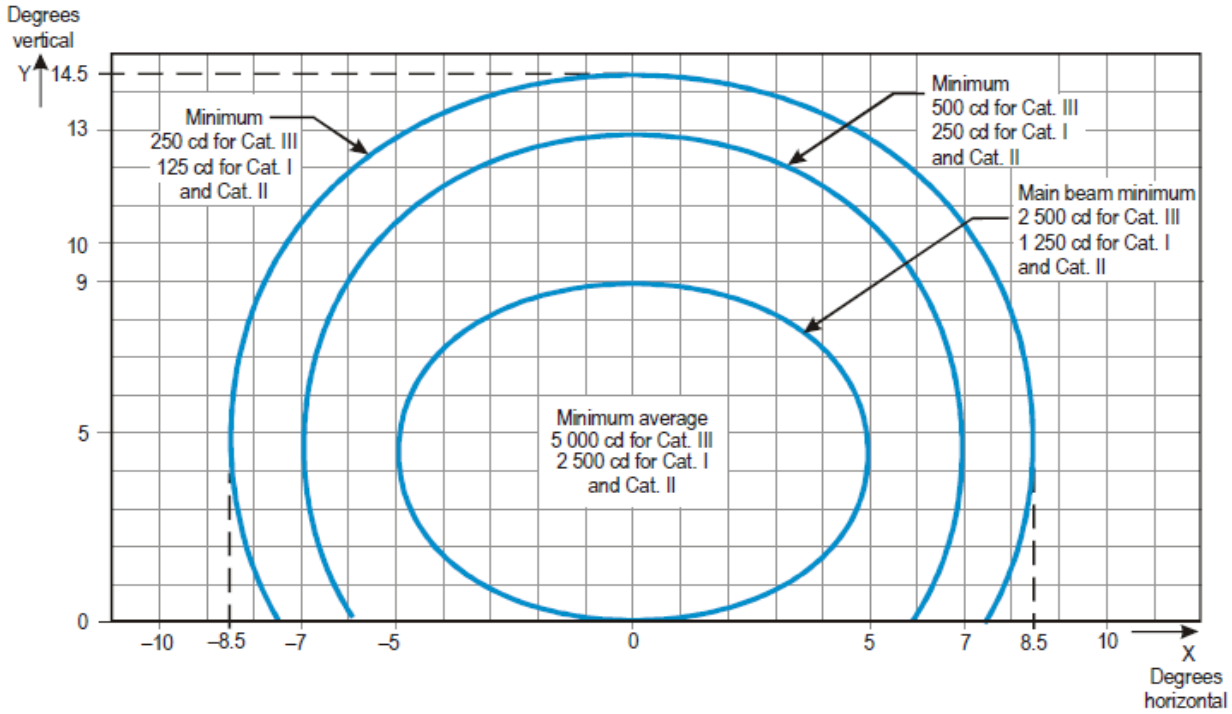
Notes:

1. Curves calculated on formula $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

a	5.0	7.0	8.5
b	3.5	6.0	8.5

2. For red light, multiply values by 0.15.
3. For yellow light, multiply values by 0.40.

Diagram 27



Notes:

1. Curves calculated on formula $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$

a	5.0	7.0	8.5
b	4.5	8.5	10

2. For red light, multiply values by 0.15.

3. For yellow light, multiply values by 0.40.

Diagram 28

(73) Runway centre line lights

(a) Runway centre line lights shall be provided on a precision approach runway category II or III; and

(b) Runway centre line lights shall be provided on a runway intended to be used for take-off with an operating minimum below a runway visual range of 400m.

(74) Runway touchdown zone lights

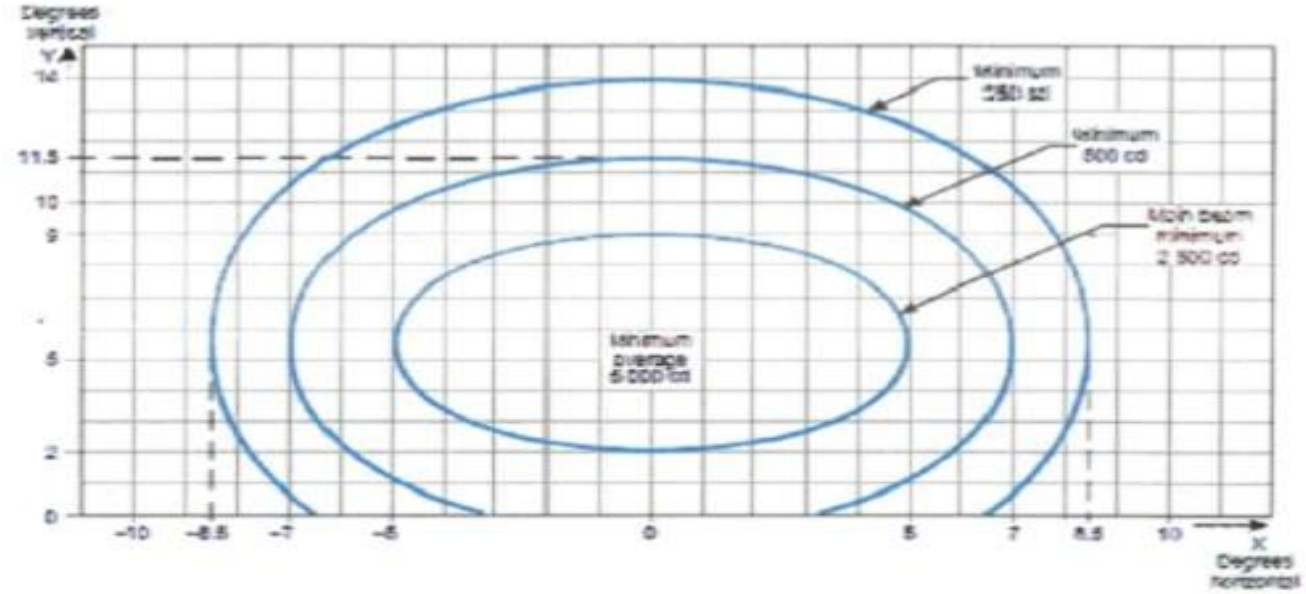
(a) Touchdown Zone (TDZ) lights shall be provided in the touchdown zone of a precision approach runway category II or III.

(b) Touchdown Zone lights shall extend from the threshold for a longitudinal distance of 900m, except that, on runways less than 1 800m in length, the system shall be shortened so that it does not extend beyond the midpoint of the runway. The pattern shall be formed by pairs of barrettes symmetrically located about the runway centre line. The lateral spacing between the innermost lights of a pair of barrettes shall be equal to the lateral spacing selected for the touchdown zone marking. The longitudinal spacing between pairs of barrettes shall be either 30m or 60m.

(c) A barrette shall be composed of at least three lights with a spacing between the lights of not more than 1.5m.

(d) Touchdown zone lights shall be fixed unidirectional lights showing variable white.

(e) Touchdown zone lights shall be in accordance with the specifications of diagram 29.



Notes:

1. Curves calculated on formula $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

a	5.0	7.0	8.5
b	3.5	5.0	6.5

2. Toe-in 4 degrees

Diagram 29

(75) Taxiway centre line lights

(a) Taxiway centre line lights shall be provided on an exit taxiway, taxiway and apron intended for use in runway visual range conditions of less than 350m in such a manner as to provide continuous guidance between the runway centre line and aircraft stands, except that these lights need not be provided where the traffic density is light and centre line marking provides adequate guidance; and

(b) Taxiway centre line lights shall be provided on a runway forming part of a standard taxi-route and intended for taxiing in runway visual range conditions of less than 350m, except that these lights need not be provided where the traffic density is light and centre line marking provides adequate guidance.

(76) Taxiway edge lights

(a) Taxiway edge lights shall be provided at the edges of a holding bay, apron and other similar areas intended for use at night and on a taxiway not provided with taxiway centre line lights and intended for use at night except that taxiway edge lights need not be provided where, considering the nature of the operations, adequate guidance can be achieved by surface illumination or other means; and

(b) Taxiway edge lights shall be provided on a runway forming part of a standard taxi-route and intended for taxiing at night where the runway is not provided with taxiway centre line lights.

(77) Runway turn pad lights

Runway turn pad lights shall be provided for continuous guidance on a runway turn pad intended for use in runway visual range conditions of less than 350m, to enable an aircraft to complete a 180 degree turn and align with the runway centre line.

(78) Stop bars

(a) A stop bar shall be provided at every runway-holding position serving a runway when it is intended that the runway shall be used in runway visual range conditions of less than 550m, except where –

(i) appropriate aids and procedures are available to assist in preventing inadvertent incursions of traffic onto the runway; or

(ii) operational procedures exist to limit, in runway visual range conditions of less than 550m, the number of—

(aa) aircraft on the manoeuvring area to 1 at a time; and

(bb) vehicles on the manoeuvring area to the essential minimum.

(b) Where there is more than 1 stop bar associated with a taxiway or runway intersection, only one shall be illuminated at any provided time.

(79) Intermediate holding position lights

Except where a stop bar has been installed, intermediate holding position in runway visual range conditions of less than 350m.

(80) Runway guard lights

(a) Runway guard lights shall be provided at each taxiway/runway intersection associated with a runway intended for use in –

(i) runway visual range conditions of less than 550m where a stop bar is not installed; and

(ii) runway visual range conditions between 550m and 1200m where the traffic density is heavy.

(b) Where more than one runway-holding positions exist at a runway or taxiway intersection, only the set of runway guard lights associated with the operational runway-holding position shall be illuminated.

(c) Runway guard lights, Configuration A, shall be located at each side of the taxiway on the holding side of the runway-holding position marking.

(d) Runway guard lights, Configuration B, shall be located across the taxiway on the holding side of the runway-holding position marking.

(e) The light beam shall be unidirectional and shall show yellow in the direction of approach to aligned to the runway-holding position.

(f) A no-entry bar light shall be collocated with a no-entry sign and no-entry marking.

(81) Visual docking guidance system

A visual docking guidance system shall be provided when it is intended to indicate, by a visual aid, the precise positioning of an aircraft on an aircraft stand and other alternative means, such as marshaller, are not practicable.

(82) Signs

(a) Signs shall be provided to convey a mandatory instruction, information on a specific location or destination on a movement area or to provide other information to meet the requirements of a surface movement guidance and control system.

(b) When designating taxiways, the use of the letter I, O or X shall not be used.

(83) Lighting

(a) Signs shall be illuminated when intended for use—

(i) in runway visual range conditions of less than 800m; or

(ii) at night in association with an instrument runway; or

(iii) at night in association with a non-instrument runway where the code number is 3 or 4.

(b) A no-entry bar shall be located across the taxiway at the end of an exit only taxiway, where it is desired to prevent traffic from entering the taxiway in the wrong direction.

(c) A no-entry bar shall be co-located with a no-entry sign and/or a no-entry marking.

(d) Taxiway centre line lights installed beyond the no-entry bar, looking in the direction of the runway, shall not be visible when viewed from the taxiway.

(84) Mandatory instruction signs

(a) A mandatory instruction sign shown on Diagram 1 shall be provided at a controlled aerodrome to identify a location beyond which an aircraft taxiing or vehicle shall not proceed unless authorised by the aerodrome control tower; and

(b) Mandatory instruction signs shall include runway designation signs, category I, II or III holding position signs, runway-holding position signs, road-holding position signs and 'NO ENTRY' signs.

(85) Information signs

(a) An information sign as shown on Diagram 2 and 3, shall be provided where there is an operational need to identify by a sign, a specific location, or routing (direction or destination) information;

(b) Information signs shall include –

(i) direction signs;

(ii) location signs;

(iii) destination signs, and

(iv) runway exit signs, runway vacated signs and intersection take-off signs.

(c) A runway exit sign shall be provided where there is an operational need to identify a runway exit;

(d) A runway vacated sign shall be provided where the exit taxiway is not provided with taxiway centre line lights and there is a need to indicate to a pilot leaving a runway the perimeter of the ILS/MLS critical/sensitive area or the lower edge of the inner transitional surface, whichever is farther from the runway centre line;

(e) A combined location and direction sign shall be provided when it is intended to indicate routing information prior to a taxiway intersection;

(f) A direction sign shall be provided when there is an operational need to identify the designation and direction of taxiways at an intersection;

(g) A location sign shall be provided in conjunction with a runway designation sign except at a runway/runway intersection;

(h) A location sign shall be provided in conjunction with a direction sign, except that it may be omitted where an aeronautical study indicates that it is not needed;

(i) Information signs shall, wherever practicable, be located on the left-hand side of the taxiway;

(j) At a taxiway intersection, information signs shall be located prior to the intersection and in line with the intermediate holding position marking. Where there is no intermediate holding position marking, the signs shall be installed at least 60m from the centre line of the intersecting taxiway where the code number is 3 or 4, and at least 40m where the code number is 1 or 2;

(k) A runway exit sign shall be located on the same side of the runway as the exit is located (i.e. left or right);

(l) A runway exit sign shall be located prior to the runway exit point in line with a position at least 60m prior to the point of tangency where the code number is 3 or 4, and at least 30m where the code number is 1 or 2;

(m) A runway vacated sign shall be located at least on one side of the taxiway located at the holding position;

(n) Where provided in conjunction with a runway vacated sign, the taxiway location sign shall be positioned outboard of the runway vacated sign;

(o) An information sign other than a location sign shall consist of an inscription in black on a yellow background;

(p) A location sign shall consist of an inscription in yellow on a black background and where it is a stand-alone sign shall have a yellow border;

(q) The inscription on a runway exit sign shall consist of the designator of the exit taxiway and an arrow indicating the direction to follow;

(r) The inscription on a runway vacated sign shall depict the pattern A runway-holding position marking; and

(s) Where a location sign and direction sign as shown on Diagram 2, are used in combination –

(i) all direction signs related to left turns shall be placed on the left side of the location sign, and all direction signs related to right turns shall be placed on the right side of the location sign, except that where the junction consists of one intersecting taxiway, the location sign may alternatively be placed on the left-hand side;

(ii) the direction signs shall be placed such that the direction of the arrows departs increasingly from the vertical with increasing deviation of the corresponding taxiway;

(iii) an appropriate direction sign shall be placed next to the location sign where the direction of the location taxiway changes significantly beyond the intersection; and

(iv) adjacent direction signs shall be delineated by a vertical black line.

Diagram 1: Mandatory instruction sign

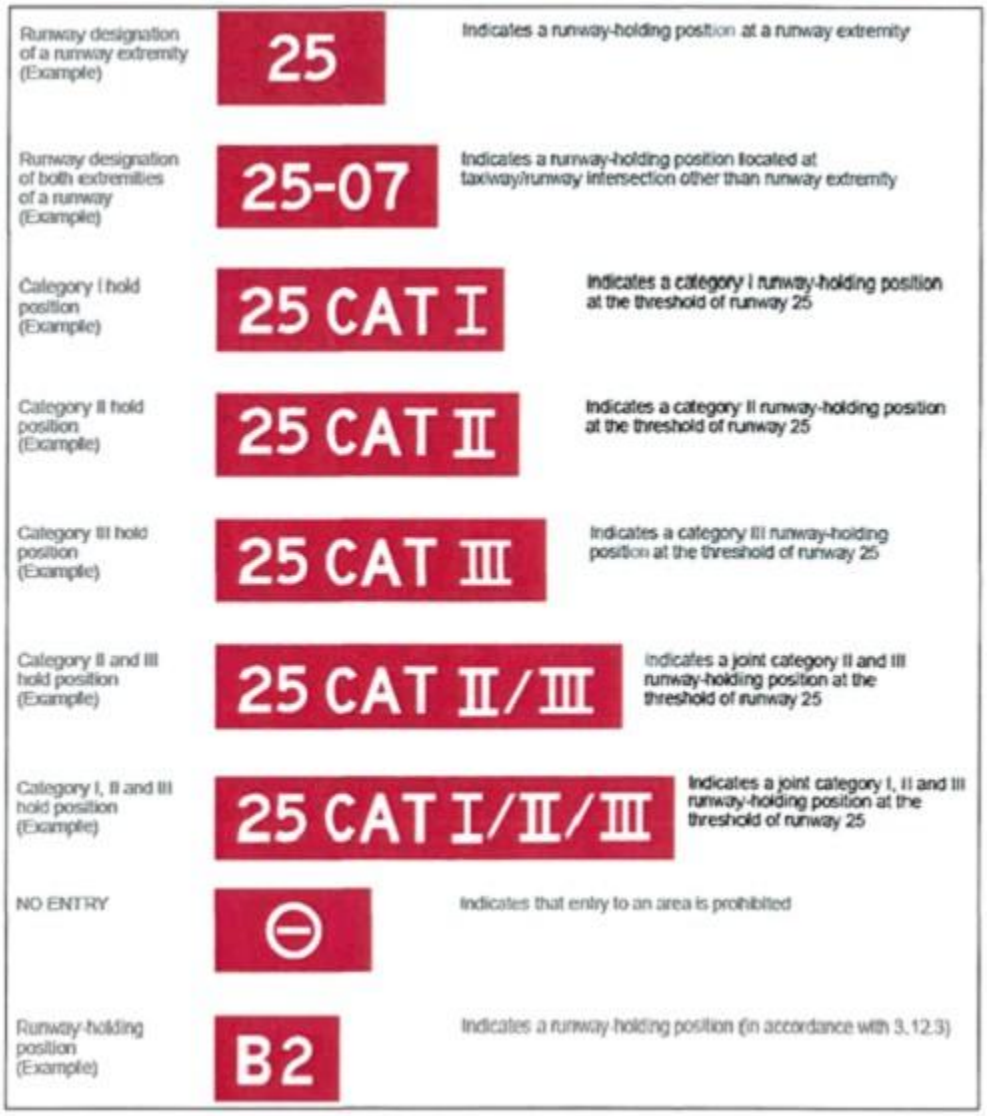


Diagram 2: Information sign

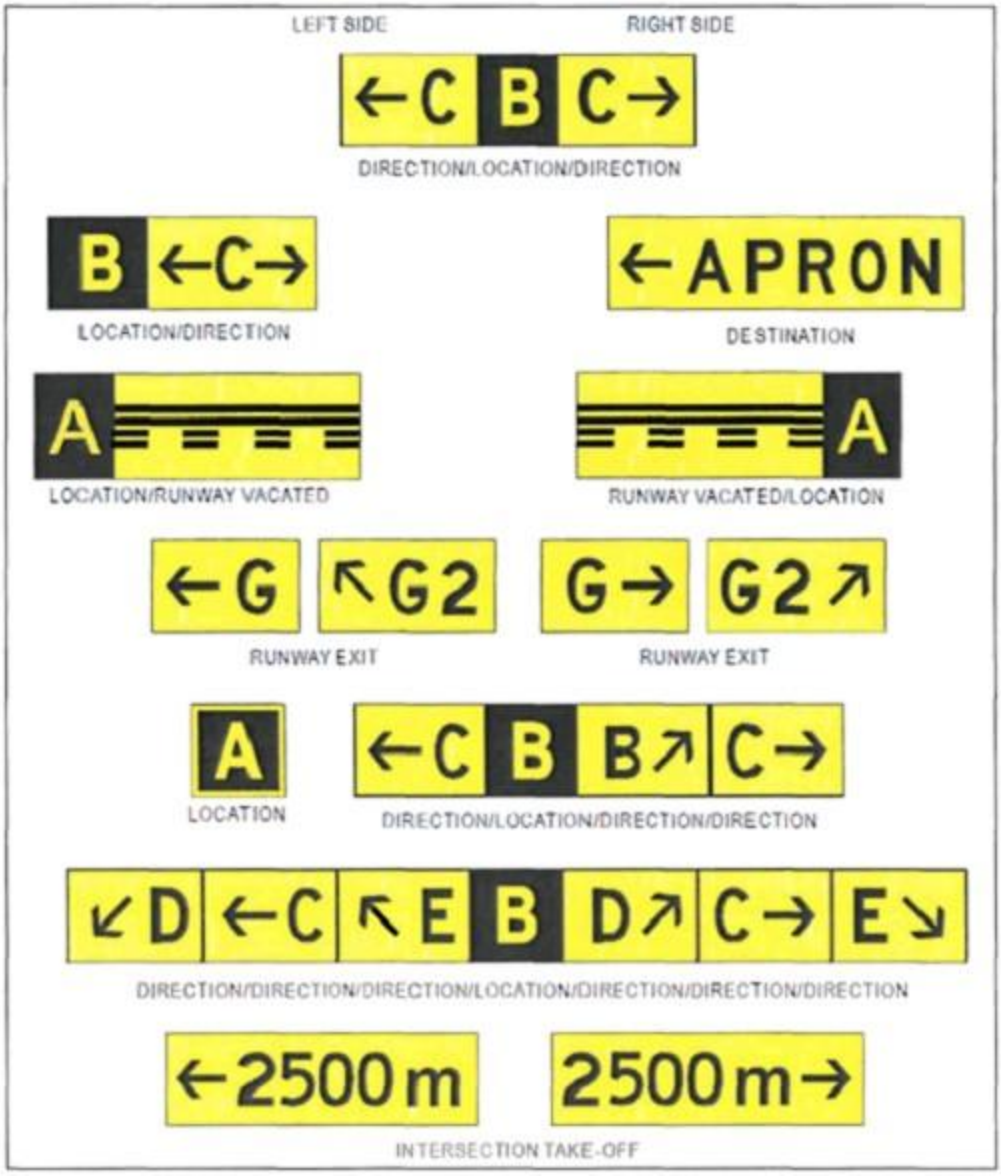


Diagram 3: Signs for location of positions at runways/takeways

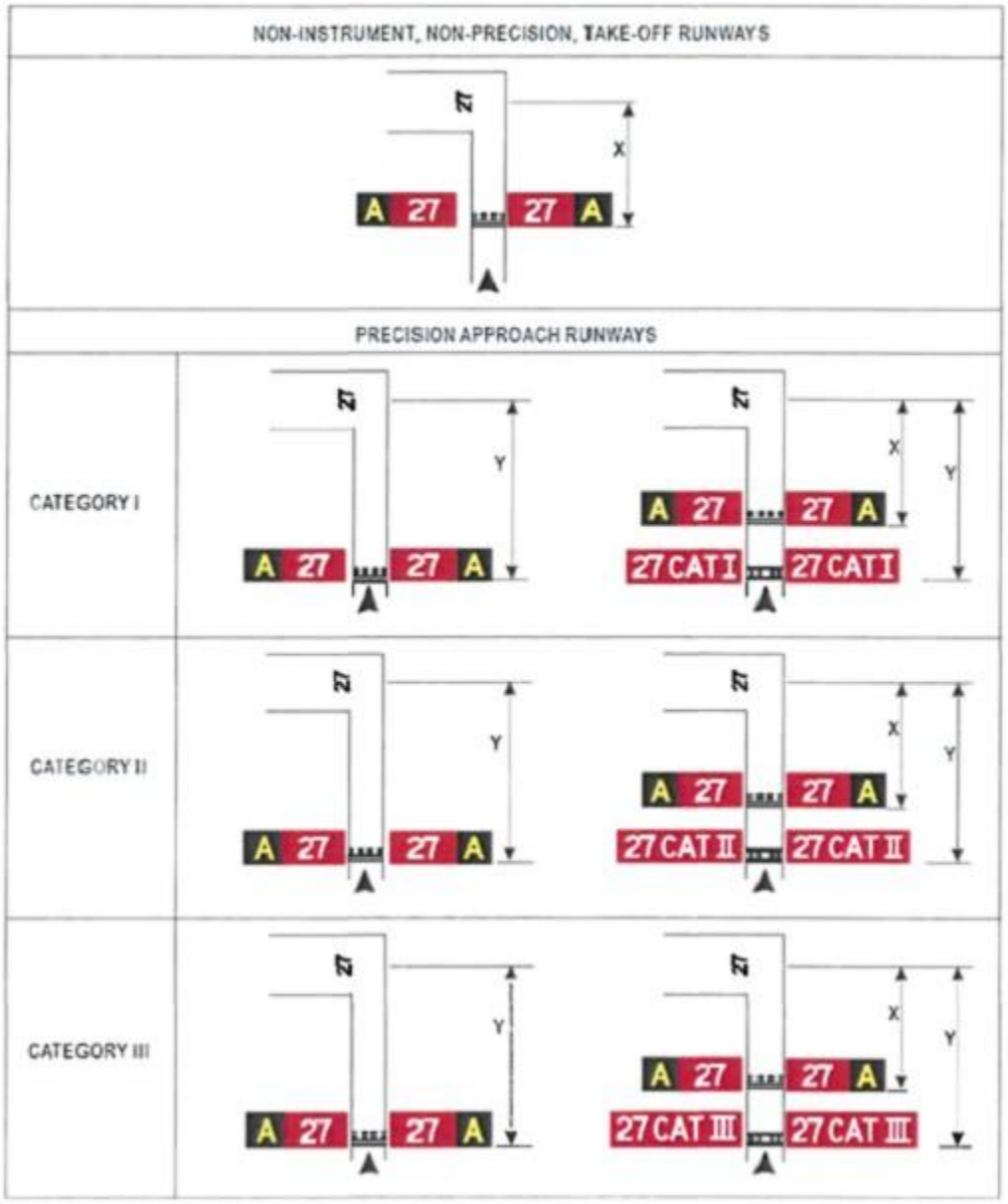


Table 12A: Location distances for taxiing guidance signs including runway exit signs

Sign height (mm)				Perpendicular distance from defined taxiway pavement edge to near side of sign	Perpendicular distance from defined runway pavement edge to near side of sign
Code number	Legend	Face (min.)	Installed (max.)		
1 or 2	200	400	700	5 – 11m	3 – 10m
1 or 2	300	600	900	5 – 11m	3 – 10m
3 or 4	300	600	900	11 – 21m	8 – 15m
3 or 4	400	800	1100	11 – 21m	8 – 15m

(86) Visual Aids for Denoting Obstacles

(a) Objects to be marked or lighted

(i) A fixed obstacle that extends above an approach surface within 3000m of the inner edge or above a transitional surface shall be marked and, if the runway is used at night, lighted, except that –

(aa) such marking and lighting may be omitted when the obstacle is shielded by another fixed obstacle; or

(bb) the marking may be omitted when the obstacle is lighted by medium-intensity obstacle lights, Type A, by day and its height above the level of the surrounding ground does not exceed 150m; or

(cc) the marking may be omitted when the obstacle is lighted by high-intensity obstacle lights by day; or

(dd) the lighting may be omitted where the obstacle is a lighthouse and an aeronautical study indicates the lighthouse light to be sufficient.

(ii) a fixed object that extends above an obstacle protection surface shall be marked and, if the runway is used at night, lighted;

(iii) vehicles and other mobile objects, excluding aircraft and aircraft servicing equipment and vehicles used only on aprons, on the movement area of an aerodrome are obstacles and shall be marked and, if the vehicles and aerodrome are used at night or in conditions of low visibility, lighted;

(iv) elevated aeronautical ground lights within the movement area shall be marked so as to be conspicuous by day. Obstacle lights shall not be installed on elevated ground lights or signs in the movement area; and

(v) all obstacles within the distance specified in Table 6 (Taxiway minimum separation which provides a distance between taxiway centre line and runway centre line), from the centre line of a taxiway, an apron taxiway, or aircraft stand taxilane shall be marked and, if the taxiway, apron taxiway, or aircraft stand taxilane is used at night, lighted.

(87) Marking of objects

(a) All fixed objects to be marked shall, whenever practicable, be coloured, but if this is not practicable, markers or flags shall be displayed on or above them, except that objects that are sufficiently conspicuous by their shape, size, or colour need not be otherwise marked; and

(b) All mobile objects to be marked shall be coloured or marked with display flags.

(88) Use of markers

(a) Markers displayed on or adjacent to objects shall be located in conspicuous positions so as to retain the general definition of the object and shall be recognizable in clear weather from a distance of at least 1000m for an object to be viewed from the air and 300m for an object to be viewed from the ground in all directions in which an aircraft is likely to approach the object; and

(b) The shape of markers shall be distinctive to the extent necessary to ensure that they are not mistaken for markers employed to convey other information, and they shall be such that the hazard presented by the object they mark is not increased.

(89) Lighting of objects

(a) The presence of objects which shall be lighted, as specified in Table 6, shall be indicated by low-, medium- or high-intensity obstacle lights, or a combination of such lights;

(b) Type C low-intensity obstacle lights shall be displayed on vehicles and other mobile objects excluding aircraft; and

(c) Type D low-intensity obstacle lights shall be displayed on follow-me Vehicles.

(90) Visual aids for denoting restricted use areas

Closed runways and taxiways a closed marking shall be displayed on a runway or taxiway, or portion thereof, which is permanently closed to the use of all aircraft.

(91) Non-load-bearing surfaces

Shoulders for taxiways, holding bays and aprons and other non-load-bearing surfaces which cannot readily be distinguished from load-bearing surfaces and which, if used by aircraft, might result in damage to the aircraft, shall have the boundary between such areas and the load-bearing surface marked by a side stripe marking.

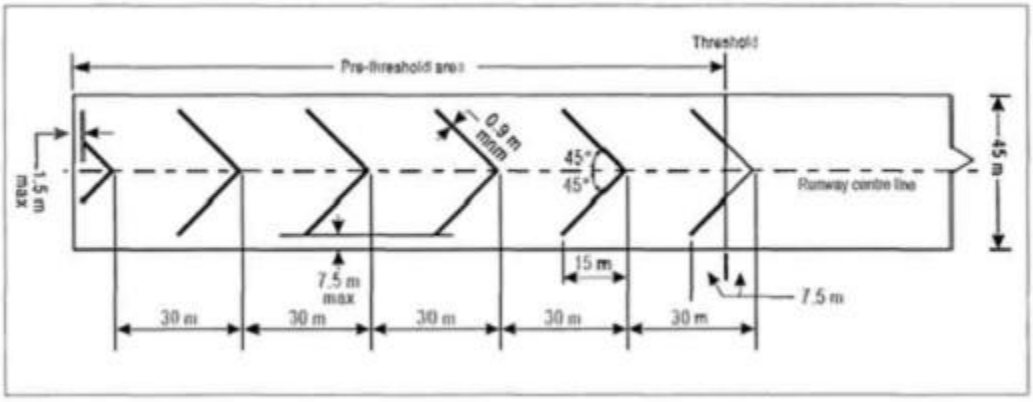
(92) Pre-threshold area

(a) When the surface before a threshold is paved and exceeds 60m in length and is not suitable for normal use by aircraft, the entire length before the threshold shall be marked with a chevron marking;

(b) A chevron marking shall point in the direction of the runway and be placed as shown in Diagram 4; and

(c) A chevron marking shall be of conspicuous colour and contrast with the colour used for the runway markings; it shall preferably be yellow. It shall have an overall width of at least 0.9m.

Diagram 4: Chevron marking



(93) Unserviceable areas

Unserviceability markers shall be displayed wherever any portion of a taxiway, apron or holding bay is unfit for the movement of aircraft but it is still possible for aircraft to bypass the area safely. On a movement area used at night, unserviceability lights shall not be used.

(94) Electrical Systems

(a) Power supply systems for air navigation facilities;

(b) Adequate primary power supply shall be available at aerodromes for the safe functioning of air navigation facilities; and

(c) For aerodromes that are referred to in regulation 139.02.1(1), the design and provision of electrical power systems for the aerodrome visual and radio navigation aids shall be such that an equipment failure shall not leave pilots with inadequate visual and non-visual guidance or misleading information.

(95) Visual aids

(a) For a precision approach runway, a secondary power supply capable of meeting the requirements specified in Table 13 for the appropriate category of precision approach runway shall be provided. Electric power supply

connections to those facilities for which secondary power is required shall be so arranged that the facilities are automatically connected to the secondary power supply on failure of the primary source of power.

(b) For a runway meant for take-off in runway visual range conditions of less than 800m, a secondary power supply capable of meeting the relevant requirements of Table 13 shall be provided.

(c) For a runway meant for use in runway visual range conditions less than a value of 550m, the electrical systems for the power supply, lighting and control of the lighting systems shall be designed so that the failure of one circuit will not leave the pilot with inadequate visual guidance or misleading information by ensuring that—

(i) each circuit is interleaved and in an interleaved system extend throughout the whole of the service (e.g. runway length);

(ii) be so arranged that a balanced symmetrical lighting pattern remains in the event of failure of one or more of the circuits;

(iii) the circuits and associated regulators are fed from separate buses such that each circuit is supplied from a separate CCR; and

(iv) arrangement is made such that a spare CCR is available to be placed in operation within a minimum amount of time.

(d) Interleaving shall be provided for lighting facilities listed in Table 13.

(96) System design

(a) For a runway meant for use in runway visual range conditions of less than 550m, the electrical systems for the power supply, lighting and control of the lighting systems included in Table 13 shall be so designed that an equipment failure shall not leave the pilot with inadequate visual guidance or misleading information;

(b) Where the secondary power supply of an aerodrome is provided by the use of duplicate feeders, such supplies shall be physically and electrically separate so as to ensure the required level of availability and independence; and

(c) Where a runway forming part of a standard taxi-route is provided with runway lighting and taxiway lighting, the lighting systems shall be interlocked to preclude the possibility of simultaneous operation of both forms of lighting.

(97) Monitoring

(a) Where lighting systems are used for aircraft control purposes, such systems shall be monitored automatically so as to provide an indication of any fault which may affect the control functions. This information shall be automatically relayed to the air traffic service unit; and

(b) The electrical power supply for lighting and control of aerodrome lighting systems shall be so designed and arranged that it operates in both local modes; which is a manual operation done by a person and remote control mode which is controlled from the power supply in the electrical vault to the ATC control mimic panel.

(98) Secondary power supply requirements

Secondary power supply requirements are as shown in Table 13.

Table 13: Secondary power supply requirements

-	**Lighting**		**Radio Aids**	
Runway Classification	**Visual Aids requiring power**	**Maximum switch-over time**	**Radio Aids Requiring Power**	**Max Switch-Over time**
Non-Instrument	Visual Approach Slope Indicator Runway Edge Runway Threshold Runway End Obstacle	2 minutes 2 minutes 2 minutes 2 minutes 2 minutes -	-	-
Non-precision	Approach Lighting System Visual Approach Slope Indicator Runway Edge Runway Threshold Runway End Obstacle	15 seconds 15 seconds 15 seconds 15 seconds 15 seconds 15 seconds -	SRE VOR NDB D/Facility - - -	15 seconds 15 seconds 15 seconds 15 seconds - - -
Precision approach category I	Approach Lighting System Runway Edge	15 seconds 15 seconds	ILS localizer ILS glide path	10 seconds 10 seconds

	Runway Threshold	15 seconds	ILS middle marker	10 seconds
	Runway End	15 seconds	ILS outer marker	10 seconds
	Obstacle	15 seconds	PAR	10 seconds
	-	15 seconds	-	-
Precision approach category II	Approach Lighting System	1 second	ILS localizer	-
	Runway Edge	15 seconds	ILS glide path	-
	Runway Threshold	1 second	ILS inner marker	-
	Runway End	1 second	ILS middle marker	-
	Runway Centre Line	1 second	ILS outer marker	-
	Runway Touchdown Zone	1 second	-	-
	Stop Bars at Taxi-Holding Positions	1 second	-	-
	Essential Taxiway Including Stop Bars other than those at Taxi-Holding Positions	15 seconds	-	-
	Obstacles	15 seconds	-	-

Precision approach category III	(Same As Category II Except all Stop Bars- 1 second)	-	Same as Category II	-

(99) Strength of pavements

(a) A holder of an aerodrome licence shall determine the bearing strength of a pavement.

(b) The bearing strength of a pavement intended for aircraft of apron (ramp) mass greater than 5 700 kg shall be made available using an aircraft classification rating-pavement classification rating (ACR-PCR) method by reporting all of the following information –

(i) the pavement classification rating (PCR);

(ii) pavement type for ACR-PCR determination;

(iii) subgrade strength category;

(iv) maximum allowable tyre pressure category or maximum allowable tyre pressure value; and

(v) evaluation method.

(c) The PCR reported shall indicate that an aircraft with an aircraft classification rating (ACR) equal to or less than the reported PCR may operate on the pavement subject to any limitation on the tyre pressure, or aircraft all-up mass for specified aircraft types.

(d) The ACR of an aircraft shall be determined in accordance with the standard procedures associated with the ACR-PCR method.

(e) For the purposes of determining the ACR, the behaviour of a pavement shall be classified as equivalent to a rigid or flexible construction.

(f) Information on pavement type for ACR-PCR determination, subgrade strength category, maximum allowable tyre pressure category and evaluation method shall be reported using the following codes:

(i) Pavement type for ACR-PCR determination –

-

Pavement Type	Code
Rigid pavement	F
Flexible pavement	R

(ii) Subgrade strength category –

Subgrade Strength Category	Code
High strength: characterized by K = 150 MN/m3 and representing all K values above 120 MN/m3 for rigid pavements, and by CBR = 15 and representing all CBR values above 13 for flexible pavements.	A
Medium strength: characterized by K = 80 MN/m3 and representing a range in K of 60 to 120 MN/m3 for rigid pavements, and by CBR = 10 and representing a range in CBR of 8 to 13 for flexible pavements.	B
Low strength: characterized by K = 40 MN/m3 and representing a range in K of 25 to 60 MN/m3 for rigid pavements, and by CBR = 6 and representing a range in CBR of 4 to 8 for flexible pavements.	C
Ultra low strength: characterized by K = 20 MN/m3 and representing all K values below 25 MN/m3 for rigid pavements, and	D

by CBR = 3 and representing all CBR values below 4 for flexible pavements.	

(iii) Maximum allowable tyre pressure category –

Max Allowable Tyre Pressure	Code
Unlimited: no pressure limit	W
High: pressure limited to 1.75 MPa	X
Medium: pressure limited to 1.25 MPa	Y
Low: pressure limited to 0.50 MPa	Z

(v) Evaluation method –

Evaluation	Code
Technical evaluation: representing a specific study of the pavement characteristics and application of pavement behaviour technology	T
Using aircraft experience: representing a knowledge of the specific type and mass of aircraft satisfactorily being supported under regular use.	U

(100) Emergency lighting

(a) At an aerodrome provided with runway lighting and without a secondary power supply, sufficient emergency lights shall be conveniently available for installation on at least the primary runway in the event of failure of the normal lighting system and to mark obstacles or delineate taxiways and apron areas.

(b) When installed on a runway the emergency lights shall, as a minimum, conform to the configuration required for a non-instrument runway.

(c) The colour of the emergency lights shall conform to the colour requirements for runway lighting, except that, where the provision of coloured lights at the threshold and the runway end is not practicable, all lights may be variable white or as close to variable white as practicable.

(101) Apron flooding lights

(a) Apron floodlighting shall be provided on an apron, on a de-icing/anti-icing facility and on a designated isolated aircraft parking position intended to be used at night.

(b) Apron floodlights shall be located to provide adequate illumination on all apron service areas, with a minimum of glare to pilots of aircraft in flight and on the ground, aerodrome and apron controllers, and personnel on the apron. The arrangement and aiming of floodlights shall be such that the aircraft stand receives light from two or more directions to minimize shadows.

(c) The spectral distribution of apron floodlights shall be such that the colours used for aircraft marking connected with routine servicing, and for surface and obstacle marking, can be correctly identified.

(d) The average illuminance shall be at least the following –

(i) Aircraft stand –

(aa) horizontal illuminance — 20 lux with a uniformity ratio (average to minimum) of not more than 4 to 1; and

(bb) vertical illuminance — 20 lux at a height of 2m above the apron in relevant directions.

(ii) Other apron areas –

(aa) horizontal illuminance — 50% of the average illuminance on the aircraft stands with a uniformity ratio (average to minimum) of not more than 4 to 1.

(102) Aircraft stand maneuvering guidance lights

(a) The aircraft stand maneuvering guidance lights shall be provided to facilitate the positioning of an aircraft on the aircraft stand on a paved apron or on a de-icing/anti-icing facility intended for use in poor visibility conditions, unless adequate guidance is provided by other means.

(b) The aircraft stand maneuvering guidance lights shall be collocated with the aircraft stand markings.

(c) The aircraft stand manoeuvring guidance lights, other than those indicating a stop position, shall be fixed yellow lights, visible throughout the segments within which they are intended to provide guidance.

(d) The lights used to delineate lead-in, turning and lead-out lines shall be spaced at intervals of not more than 7.5m on curves and 15m on straight sections.

(e) The lights indicating a stop position shall be fixed unidirectional lights showing red.

(f) The intensity of the lights shall be adequate for the condition of visibility and ambient light in which the use of the aircraft stand is intended.

(g) The lighting circuit shall be designed so that the lights may be switched on to indicate that an aircraft stand is to be used and switched off to indicate that it is not to be used.";

(y) the substitution in technical standard 139.02.11 for the following section Technical Standard:

"**1. The control, distribution, review and amendment of an Aerodrome Manual**

(1) Control

(a) Develop a procedure which defines the following controls:

(b) Identification of documents, date, and revision status;

(c) Storage of documents;

(d) Protection against unauthorised use and modification documents and records;

(e) Legibility, retrieval, retention period, and disposition of documents and records;

(f) Approval process for adequacy prior to issue; and

(g) Unauthorized use of Obsolete or outdated document.

(2) Distribution

Develop a procedure for distribution of parts/ versions of the updated and approved AM to the relevant personnel and interested parties.

(3) Review

Develop a procedure to review the Aerodrome Manual and supporting documents to determine the suitability, adequacy, and effectiveness to achieve the intended purpose with the following controls:

(a) review process

(b) Annual review of Aerodrome Manual.

(c) Review the frequency of documents.

(d) Role players during the review process.

(e) Approval process.

(4) Amendment

Develop a procedure to make changes to documents which defines the following controls:

(a) Responsibility for maintaining the accuracy of the aerodrome manual and associated documents shall be clearly defined in the manual;

(b) Request for change,

(c) The aerodrome manual shall include a record of all amendments and list of effective pages;

(d) Approval of changes made;

(e) Revision status control;

(f) Communicating changes to all affected parties; and

(g) Any amendments or additions shall be communicated to the Authority for approval.

2. Format of the aerodrome manual

(1) An aerodrome operator shall submit the aerodrome manual for approval containing information on how operational procedures and their safe management will be delivered.

(2) The aerodrome manual shall accurately reflect the aerodrome's SMS and show how the aerodrome intends to measure its performance against safety targets and objectives.

(3) All aerodrome safety policies, operational procedures and instructions are contained in detail or cross referenced to other formally accepted or recognized publications.

3. Contents of the aerodrome manual

(1) The aerodrome manual shall contain, as a minimum, the following sections, including some of their requirements–

(a) a table of contents;

(b) a list of the amendments: this section shall log the updates and corrections made to the aerodrome manual;

(c) a distribution list;

(d) aerodrome administrative data: an organizational chart shall be provided, as well as the aerodrome operator's safety responsibilities;

(e) a description of the aerodrome: this includes maps and charts. The physical characteristics of the aerodrome shall be documented, as well as the information regarding the ARFF level of category, ground aids, primary and secondary electrical power systems, and main obstacles. Sufficiently detailed charts of the aerodrome shall also be included (showing the aerodrome's boundaries and different areas (manoeuvring area, apron, etc.). All deviations from the regulatory provisions authorized by the Director shall be listed together with their

validity and references to the related documents including any safety assessments:

(f) a description of the intended operations, including–

(i) the critical aeroplanes the aerodrome is intended to serve;

(ii) the category of runway(s) provided (non-instrument, instrument including non-precision and precision);

(iii) the different runways and their associated levels of service;

(iv) the nature of aviation activities (commercial, passenger. Air transport, cargo, aerial work, general aviation);

(v) the type of traffic permitted to use the aerodrome (international/national, IFR/VFR, scheduled/non-scheduled); and

(vi) the minimum RVR that aerodrome operations can be permitted.

(g) a description of each of the aerodrome operator's procedures related to the safety of aeronautical operations at the aerodrome. For each procedure, a description or listing of the following–

(i) the responsibilities of the aerodrome operator shall be clearly described;

(ii) the tasks that are to be achieved by the aerodrome operator or its subcontractors are listed; and

(iii) the means and procedures required to complete these tasks. This shall be described or appended, together with the necessary details such as the frequency of application and operating modes;

(h) a description of an aerodrome operator's SMS as follows–

(aa) the SMS section of the manual shall be developed, and the related procedures and documents are enclosed, as well as the safety policy of the aerodrome operator signed by the accountable manager;

(bb) the framework for the implementation of an SMS at an aerodrome shall be as prescribed in Part 140; and

(cc) the aerodrome SMS shall be commensurate with the size of the aerodrome and with the level and complexity of the services provided; and

(i) responsibilities attributed to other aerodrome stakeholders shall be clearly identified.

4. Updating of the aerodrome manual

(1) Responsibility for maintaining the accuracy of the aerodrome manual shall be clearly defined in the manual.

(2) The manual shall be updated using a defined process and shall include a record of all amendments, effective dates and amendment approvals.

(3) The method of enabling all aerodrome operating staff to have access to the relevant parts of the manual shall be clearly defined and can be demonstrated.

(4) A method of tracking amendments and ensuring their receipt shall be established when using an electronic means of distribution.

(5) Any amendments or additions shall be communicated to the Authority in accordance with the requirements in this subpart.

(z) the deletion in technical standard 139.02.15 for subsection (1) paragraphs (a) to (e) including the table relating to Minimum useable amounts of extinguishing agent.

(Aa) the insertion in technical standard 139.02.19 section 1 after subsection (1) of the following section:

"(1A) The process for mitigating against the increase or potential increase in the wildlife strike hazard shall include but shall not limited to -

(a) identification of all relevant stakeholders, government officials, aerodrome staff, the ATSU, aircraft operator representatives (including pilots), nature conservation organizations, local municipalities land developers in the vicinity of the aerodrome for effective wildlife hazard management.

(b) establishment and coordination of a wildlife committee with all relevant stakeholders.

(c) establishment of a process to liaise with non-aerodrome agencies, local landowners and other relevant stakeholders.

(d) conducting an inventory of sites that attract wildlife within the 13 km radius of the aerodrome reference point.

(e) development of a management plan to reduce attractiveness of wildlife present in the vicinity of the aerodrome.

(f) development of methods of preventing hazardous wildlife from gaining access to the aerodrome.

(g) minimising the cultivation of agricultural crops that may provide food for hazardous wildlife around the aerodrome.

(h) mitigating against water bodies such depressions, open drainage ditches, ponds and lakes.

(i) The following is a non-exhaustive list of the types of land uses which have proven to attract hazardous wildlife and which should, in particular, be prevented, eliminated or mitigated on and in the vicinity of aerodromes:

(i) fish processing;

(ii) agriculture;

(iii) cattle feed lots;

(iv) garbage dumps and landfill sites;

(v) factory roofs and parking lots, or other infrastructure;

(vi) theatres and food outlets;

(vii) wildlife refuges;

(viii) artificial and natural lakes;

(ix) golf or polo courses

(x) animal farms; and

((xi) slaughterhouses”.”

(Bb) the insertion after technical standard 139.02.35 of the following technical standard:

“**139.02.36 Airport Design and Master Plan**

(1) The physical planning which includes the development of the following facilities:

(a) Airspace and air traffic control provisions;

(b) Airfield configuration (including approach zones);

(c) Terminal complex;

(d) Circulation, utility and communication networks;

(e) Support and service facilities;

(f) Ground access systems; and

(g) Over-all land use patterns.

(2) The airport design plans shall be submitted to the Director every 5 years or whenever there are significant changes to the initial submission.

(3) The airport design plans for the whole airport shall -

(a) be prepared, defining the basic concepts and over-all layout which will best exploit the potential of the site.

(b) evolve through consideration of all the factors which affect air transport and which will influence or impinge on the development and use of the airport throughout its working life.

(c) provide a framework, within which future development and expansion can take place and indicate the ultimate over-all size.

(d) define the aircraft, passenger, cargo and ground vehicle capacities, together with an indication of the major phases of construction which are possible in physical and economic terms and the dates by which they are forecast to be required.

(e) provide the most effective framework within which the individual facilities can operate their separate functions at the highest possible levels of efficiency.

(4) At all stages of planning, the reason for particular decisions and the influences supporting particular concepts and lines of progress shall be stated and recorded.

(5) The development of passenger building plans on the airport design plans shall be limited to conceptual studies and drawings, not to preclude adjustments which evolve later in the detailed planning phase.

(6) The airport design plans shall include a forecast of aviation demand to determine the future facility requirements.

(7) The requirements of locally based itinerant general aviation activity, both national and international, shall be considered an integral element of the airport design.

(8) The airport design plans shall be reviewed at least every 5 years and adjusted as appropriate to reflect conditions at the time of review.

(9) The airport design plans shall be undertaken in consultation with all other interested and affected parties and carried out in the closest liaison with national and local government transport and aircraft operators.";

(Cc) the substitution in Technical Standard 139.03.2(1.5) for subsection (1) of the following subsection:

"(1) The following data shall be measured, as appropriate, for each facility provided on a heliport—

"(g) helicopter clearway — length, ground profile; or, when elevated, height above the FaTo, length and width; **[and]**

(h) visual aids for approach procedures, marking and lighting of FaTo, TLOF, taxiways and aprons**[.]**;and

(i) approach surface — when elevated, the height of the inner edge above the FaTo;";

(Dd) the substitution in Technical Standard 139.03.2 (2.1.2) (1) for subsection (1) of the following subsection:

"(1) A helicopter clearway shall provide:

(a) an area free of obstacles, except for essential objects which because of their function are located on it, of sufficient size and shape to ensure containment of the design helicopter when it is accelerating in level flight, and close to the surface to achieve its safe climbing speed; **[and]**

(b) when solid, a surface which is contiguous and flush with the FaTo and safety area; is resistant to the effects of rotor downwash and is free of hazards if a forced landing is required**[.]**; or

(c) when elevated, clearance above all obstacles.";

(Ee) the substitution for Technical Standard 139.03.2 (2.1.2) (2) of the following Technical Standard:

"(2) When a helicopter clearway is provided, **[it]** the inner edge shall be located **[beyond the end of the rejected take-off area available.]** —

(a) at the outer edge of the safety area; or

(b) when elevated - directly above or directly below the outer edge of the safety area.";

(Ff) the substitution for Technical Standard 139.03.2(2.2.1) for subsection (3) of the following subsection:

"(3) A TLOF may be of any shape but, subject to an appropriate risk assessment, shall be of sufficient size to contain:

(a) **[for a helicopter with an MTOM of more than 3 175 kg,]** an area within which may be accommodated a circle of diameter not less than 1 D of the largest helicopter the helideck is intended to serve; and

(b) **[for a helicopter with an MTOM of 3 175 kg or less,]** an area within which may be accommodated a circle of diameter not less than 0.83 D of the largest helicopter the helideck is intended to serve.";

(Gg) the substitution in Technical Standard 139.03.2(2.2.1) for subsection (8) of the following subsection:

"(8) A fixed object shall not be permitted around the edge of the TLOF except for **[frangible]** objects which because of their function, must be located thereon.";

(Hh) the substitution for Technical Standard 139.03.2(2.3) for subsection (11) of the following subsection:

"(11) A fixed object shall not be permitted around the edge of the TLOF except for **[frangible]** objects which, because of their function must be located thereon.";

(Ii) the substitution of Technical Standard 139.03.2 for section (3.1) of the following section:

"(1) The limits of an approach surface shall comprise:

(a) an inner edge, horizontal and perpendicular to the centre line of the approach surface, with a minimum width equal **[in length]** to the **[minimum]** specified width or diameter of the FaTo plus the safety area**[, perpendicular to the centre line of the approach surface]** and located at the outer edge of the safety area**[;]** or when vertical procedures are being utilized, directly above the outer edge of the safety area.

(b) two side edges originating at the ends of the inner edge diverging uniformly at a specified rate from the vertical plane containing the centre line of the FaTo; and

(c) an outer edge horizontal and perpendicular to the centre line of the approach surface **[and]** at a **[specified]** height of 152 m above the elevation of the FaTo**[.]**; or when a PinS approach procedure with proceed visually instruction

is defined, a specified height above the elevation of the FaTo. (Refer to Table 2 for dimensions and slopes of surfaces).

(2) The elevation of the inner edge shall be the elevation of the FaTo at the point on the inner edge that is intersected by the centre line of the approach surface**[.]** or when vertical procedures are being utilized, the level at which obstacle clearance is achieved (refer to figure 14).

[(3) For a heliport intended to be used by a helicopter operated in performance class 1 and when approved by an appropriate Authority, the origin of the inclined plane may be raised directly above the FaTo (refer to figure 14).]

[(4)] (3) The slopes of the approach surface shall be measured in the vertical plane containing the centre line of the surface.

[(5)] (4) In the case of an approach surface involving a turn or turns, the surface shall be a complex surface containing the horizontal normal to its centre line and the slope of the centre line shall be the same as that for a straight approach surface (refer to figure 15).

[(6) In the case of an approach surface involving a turn, the surface shall not contain more than one curved portion.]

[(7)] (5) Where a curved portion of **[an]** a design category B or C approach surface is provided, the sum of the radius of arc defining the centre line of the approach surface and the length of the straight portion originating at the inner edge shall not be less than 575m.

[(8)] (6) Any variation in the direction of the centre line of an approach surface shall be designed so as not to necessitate a turn radius less than 270m.";

(Jj) the substitution in Technical Standard 139.03.2(3.1) for Figure 15 of the following Figure:

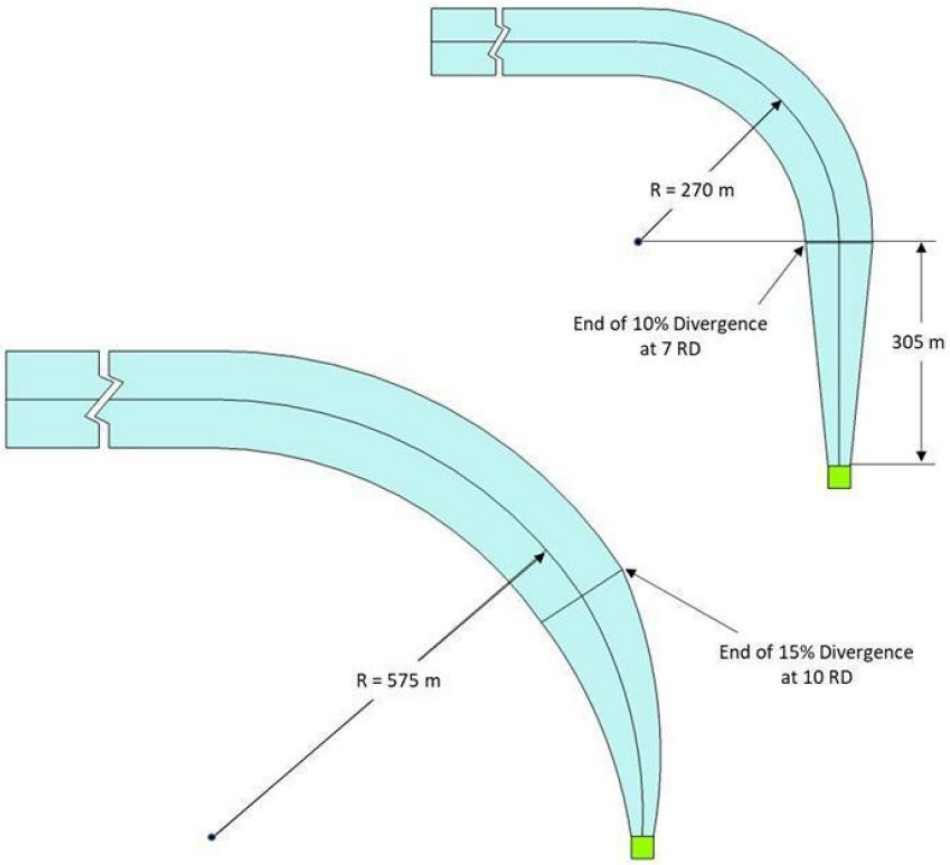


Figure 15. Curved approach and take-off climb surface for all FaTos

(Kk) the substitution in Technical Standard 139.03.2(3.1) for Table 2 of the following Table:

"**Table 2: [Slopes of obstacle limitation surfaces for all visual FaTos.] Approach and take-off climb slope design categories**

SURFACE and DIMENSIONS	**SLOPE DESIGN CATEGORIES**		
	A	**B**	**C**
APPROACH and TAKE-OFF CLIMB SURFACE:			
Length of inner edge	Width of safety area	Width of safety area	Width of safety area
Location of inner edge	Safety area boundary (Helicopter **[C]**clearway boundary if provided)	Safety area boundary	Safety area boundary
Divergence: (1st and 2nd section) Day use only Night use	 10% 15%	 10% 15%	 10% 15%
First Section: Length Slope Outer Width	 3 386 m 4.5% (1:22.2) (b)	 245 m 8% (1:12.5) N/A	 1 220 m 12.5% (1:8) (b)
Second Section: Length Slope Outer Width	 N/A N/A N/A	 830 m 16% (1:6.25)	 N/A N/A N/A

Total Length from inner edge (a)	3 386 m[c]	(b) 1 075 m[c]	1 220 m[c]
Transitional Surface: **[(FaTos with a PinS approach procedure with a VSS)]** Slope Height	 50% (1:2) 45 m[d]	 50% (1:2) 45 m[d]	 50% (1:2) 45 m[d]
(a) The approach and take-off climb surface lengths of 3 386 m, 1 075 m and 1 220 m associated with the respective slopes, brings the helicopter to 152 m (500 ft) above the FaTo elevation.			
(b) Seven rotor diameters overall width for day operations or 10 rotor diameters overall width for night operations.			
(c) This length may be reduced if vertical procedures are in place or increased if the approach surface is extended to meet the OCS of the PinS arrival or departure procedure.			
(d) See 3.2 Transitional surface.			

(LI) the substitution for Technical Standard139.03.2 for section (3.2) of the following section:

"(1) The limits of a transitional surface shall comprise:

(a) a lower edge beginning at a point on the side of the approach or take-off climb surface at a specified height **[above the lower edge]** extending down the side of the approach or take-off climb surface to the inner edge **[of the approach or takeoff climb surface]** and from there along the length of the side of the

helicopter clearway, when provided, and safety area, parallel to the centre line of the FaTo; and

(b) an upper edge located at: **[;a specified height above the lower edge as set out in Table 2.]**

(i) 45 m (150 ft) above the FaTo; or

(ii) when vertical procedures are being utilized; 15m (50 ft) above the elevation of the upper edge of the ascent/descent surface.

(2) The elevation of a point on the lower edge shall be:

(a) along the side of the approach or take-off climb surface equal to the elevation of the approach or take-off climb surface at that point; **[and]**

(b) if provided, along the helicopter clearway equal to the elevation of the helicopter clearway; and

(c) along the safety area equal to the elevation of the FaTo.

(3) The slope of the transitional surface shall be measured in a vertical plane at right angles to the centre line of the FaTo.";

(Kk) the substitution in Technical Standard 139.03.2 for section (3.3) of the following section:

"(1) The limits of a take-off climb surface shall comprise:

(a) an inner edge, horizontal **[equal in length to the]** and perpendicular to the centre line of the take-off climb surface, with a minimum **[specified]** width of the width or diameter **[of]** when located at the outer edge of the safety area or helicopter clearway, the FaTo plus the safety area, **[perpendicular to the centre line of the take-off climb surface and located at the outer edge of the safety area]** or when located at the outer edge of the elevated helicopter clearway, the elevated helicopter clearway.

(b) two side edges originating at the ends of the inner edge and diverging uniformly at a specified rate from the vertical plane containing the centre line of the FaTo; and;

(c) an outer edge horizontal and perpendicular to the centre line of the take-off climb surface **[and]** at a height of 152m above the elevation of the FaTo**[.]**; or when a PinS departure procedure with proceed visually instruction is defined, a specified height above the elevation of the FaTo.

(2) The elevation of the inner edge shall be the elevation of the FaTo at the point on the inner edge that is intersected by the centre line of the take-off climb surface or when located at the outer edge of the helicopter clearway, the elevation of the helicopter clearway.

[(3) Where a clearway is provided, the elevation of the inner edge of the take-off climb surface shall be located at the outer edge of the clearway at the highest point on the ground based on the centre line of the clearway.]

[(4)] (3) In the case of a straight take-off climb surface, the slope shall be measured in the vertical plane containing the centre line of the surface.

[(5)] (4) In the case of a take-off climb surface involving a turn or turns, the surface shall be a complex surface containing the horizontal normal to its centre line and the slope of the centre line shall be the same as that for a straight take-off climb surface (refer to figure 15).

[(6) In the case of a take-off climb surface involving a turn, the surface shall not contain more than one curved portion.]

[(7)] (5) Where a curved portion of a design category B or C take-off climb surface is provided, the sum of the radius of arc defining the centre line of the take-off climb surface and the length of the straight portion originating at the inner edge shall not be less than 575m.

[(8)] (6) Any variation in the direction of the centre line of a take-off climb surface shall be designed so as not to necessitate a turn of radius less than 270m.";

(Mm) the substitution in Technical Standard 139.03.2 for section (3.6) of the following section:

"(1) The following obstacle limitation surfaces shall be established for a FaTo at heliports with a point in space (PinS) approach or departure procedure **[utilizing a visual segment surface]** with a proceed visually instruction (refer to figure 13):

(a) take-off climb surface;
(b) approach surface; and
(c) transitional surfaces.

(2) The following obstacle limitation surfaces shall be established for a FaTo at heliports other than specified in subsection (1), including heliport with a PinS approach or departure procedure **[where a visual segment surface is not provided]** without a proceed visually instruction:

(a) take-off climb surface; and

(b) approach surface.

(3) The slopes of the obstacle limitation surfaces shall not be greater than, and the dimensions not less than those specified in Table 2 **[, the slopes shall be located as shown in figures 11, 12 and 16]**.

[(4) For a heliport that have an approach or take-off climb surface with a 4.5% slope design, objects shall be permitted to penetrate the obstacle limitation surface if the results of an aeronautical study approved by an appropriate Authority have reviewed the associated risks and mitigation measures.]

[(5)] (4) New objects or extensions of existing objects shall not be permitted above any of the surfaces in subsections (1) and (2) except when shielded by an existing immovable object **[or after an aeronautical study approved by an appropriate**

authority determines that the object shall not adversely affect the safety or significantly affect the regularity of a helicopter operations].

[(6)] (5) Existing objects above any of the surfaces in subsections (1) and (2) shall be removed except when the object is shielded by an existing immovable object **[or after an aeronautical study approved by an appropriate authority determines that the object shall not adversely affect the safety or significantly affect the regularity of a helicopter operations]**.

[(7)] (6) **[A surface-level]** A heliport shall have at least **[one]** two approach and take-off climb surfaces, separated by not less than 135°.

[(8) An aeronautical study shall be undertaken by an appropriate authority when only a single approach and take-off climb surface is provided considering as a minimum, the following factors:

(a) the area or terrain over which the flight is being conducted;

(b) the obstacle environment surrounding a heliport and the availability of at least one protected side slope;

(c) the performance and operating limitations of a helicopter intending to use a heliport; and

(d) the local meteorological conditions including the prevailing winds.]";

(Nn) the deletion of in Technical Standard 139.03.2 of section (3.7);

(Oo) the substitution in Technical Standard 139.03.2(4.15) for subsection (2) of the following subsection:

"(2) A helicopter air taxi-route centre line marking or **[flush in-ground centre line]** markers shall be located along the centre line of a helicopter air **[taxiway]** taxi-route.";

(Pp) the substitution in Technical Standard 139.03.2(4.15) for subsection (4) of the following subsection:

"(4) A helicopter air taxi-route centre line, **[when on an unpaved surface]** that will not accommodate painted markings, shall be marked with **[flush in-ground 15cm wide and approximately 1.5m in length yellow]** markers, spaced at intervals of not more than 30m on straight sections and not more than 15m on curves, with a minimum of four equally spaced markers per section.";

(Qq) the substitution in Technical Standard 139.03.2 for section (5.1) of the following section:

"(1) A heliport beacon shall be provided at a heliport where:

(a) long-range visual guidance is considered necessary and is not provided by other visual means; or

(b) identification of a heliport is difficult due to surrounding lights.

[(2) A heliport beacon shall be located on or adjacent to a heliport preferably at an elevated position so that it does not dazzle a pilot at short range.

(3) A heliport beacon shall emit repeated series of equispaced short duration white flashes in the format referenced in figure 33.

(4) The light from the beacon shall show all angles of azimuth.

(5) The effective light intensity distribution of each flash shall be as referenced in figure 35, illustration 1.]".

(Uu) the deletion of Figure 33

(Vv) the deletion of Figure 34

(Ww) the substitution for Figure 35 of the following Figure:

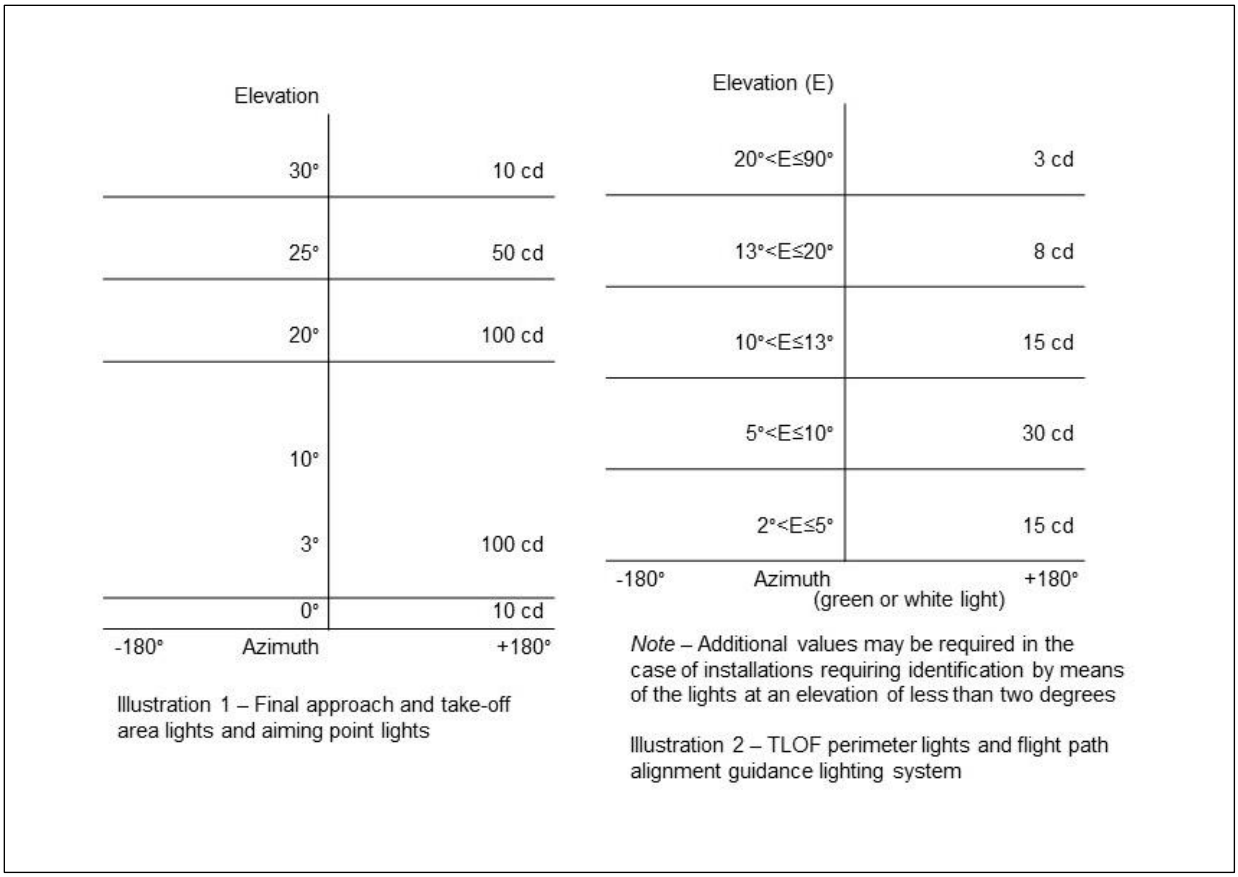


Figure 35. Isocandela diagrams <u>(green or white light)</u>

(Rr) the substitution in Technical Standard 139.03.2 for section (5.2) of the following section:

"(1) An approach lighting system shall be provided at a heliport to indicate a preferred approach direction.

[(2) The approach lighting system shall be located in a straight line along the preferred direction of approach.

(3) The lighting system shall consist of a row of three lights spaced uniformly at 30m intervals and of a crossbar 18m in length at a distance of 90m from the perimeter of the FaTo, refer to figure 34.

(4) The lights forming the crossbar shall be as nearly as practicable in a horizontal straight line at right angles and bisected by the line of the centre line lights spaced at 4.5m intervals.

(5) The steady lights shall be omnidirectional white lights.

(6) Sequenced flashing lights shall be omnidirectional white lights.

(7) The flashing lights shall have a flash frequency of one per second and their light distribution shall be as referenced in figure 35, Illustration 3.

(8) The flash sequence shall commence from the outermost light and progress towards the crossbar.

(9) A suitable brilliancy control shall be incorporated to allow for adjustment of light intensity to meet the prevailing conditions.

(a) steady lights — 100% ;30% and 10% and

(b) flashing lights — 100%, 10% and 3%.];";

(Ss) the substitution for the heading in Technical Standard 139.03.2(5.6) of the following heading:

"**5.6. FaTo area [lighting systems] <u>perimeter lights</u> for <u>onshore</u> surface level heliports.**";

(Tt) the substitution in Technical Standard 139.03.2 for section (5.6) (1-4) of the following section:

"(1) Where a FaTo with a solid surface is established at a surface-level heliport intended for use at night, FaTo <u>perimeter</u> lights shall be provided except that they may be omitted where the FaTo and the TLOF are nearly coincidental or the extent of the FaTo is self-evident.

(2) FaTo <u>perimeter</u> lights shall be placed along the edges of the FaTo. The lights shall be uniformly spaced as follows:

(a) for an area in the form of a square or rectangle, at intervals of not more than 50m with a minimum of four lights on each side including a light at each corner; and

(b) for any other shaped area, including a circular area, at intervals of not more than 5m with a minimum of ten lights.

(3) FaTo perimeter lights shall be fixed omnidirectional lights showing green or white with variable intensity. **[Where the intensity of the lights is to be varied the lights shall show variable white.]**

(4) The light distribution of FaTo perimeter lights shall be as shown in figure 35, Illustration **[5]** 1.";

(Uu) the substitution for Technical Standard139.03.2(5.7) for subsection (3) of the following subsection:

"(3) Aiming point lights shall form a pattern of at least 6 omnidirectional white lights as shown in figure 29. The lights shall be arranged equidistantly with a light at the apex and at both corners.";

(Vv) the substitution in Technical Standard139.03.2 (5.7) for subsection (5) of the following subsection:

"(5) The light distribution of aiming point lights shall be as shown in figure 35, illustration **[5]** 1.";

(Ww) the substitution in Technical Standard139.03.2 for section (5.8) (1-18) of the following section:

"(1) A TLOF lighting system shall be provided at a heliport intended for use at night.

(2) For a surface level heliport, lighting for the TLOF in a FaTo shall consist of **[one or more]** either of the following:

(a) perimeter lights; and

[(b) floodlighting;]

[(c)] (b) arrays of segmented point source lighting (ASPSL) or luminescent panel (LP) lighting to identify the TLOF perimeter when (a) **[and (b) are]** is not practicable and FaTo perimeter lights are available.

(3) For an elevated heliport, shipboard heliport or helideck, lighting of the TLOF in a FaTo shall consist of:

(a) perimeter lights; and

(b) ASPSL or LPs to identify the **[TDPM]** TDPC or floodlighting to illuminate the TLOF.

(4) When enhanced surface texture cues are required at a TLOF, ASPSL or LPs to identify the TDP **[or]**, floodlighting shall be provided at a surface-level heliport intended for use at night **[when enhanced surface texture cues are required]**.

(5) TLOF perimeter lights shall be placed along the edge of the area designated for use as the TLOF or within a distance of 1.5m from the outer edge. TLOF perimeter lights shall be uniformly spaced at intervals of not more than 3m for elevated heliports, helidecks and shipboard heliports and not more than 5m for surface-level heliports.

[(6) Where the TLOF is a circle the light shall be:

(a) located on straight lines in a pattern which shall provide information to a pilot on drift displacement; and

(b) if paragraph (a) is not practicable, evenly spaced around the perimeter of the TLOF at the appropriate interval, except that over a sector of 45 degrees the lights shall be spaced at half spacing.]

(7) TLOF perimeter lights shall be uniformly spaced at intervals of not more than 3m for elevated heliports and helidecks and not more than 5m for surface level heliports. There shall be a minimum number of four lights on each side including a light at each corner.

(8) For a circular TLOF there shall be a minimum of 14 lights.]

[(9)] (6) The TLOF perimeter lights shall be installed at an elevated heliport or fixed helideck such that the pattern cannot be seen by a pilot from below the elevation of the TLOF.

[(10)] (7) The TLOF perimeter lights shall be installed on a moving helideck or shipboard heliport, such that the pattern cannot be seen by a pilot from below the elevation of the TLOF when the helideck or shipboard heliport is level.

[(11) On surface level heliports, ASPSL or LPs, if provided to identify the TLOF, shall be placed along the marking designating the edge of the TLOF. Where the TLOF is a circle, they shall be located on straight lines circumscribing the area.

(12) On surface level heliports the minimum number of LPs on a TLOF shall be nine.

(13) The total length of Luminescent Panels in a pattern shall not be less than 50% of the length of the pattern. There shall be an odd number with a minimum number of 3 panels on each side of the TLOF including a panel at each corner.

(14) LPs shall be uniformly spaced with a distance between adjacent panel ends of not more than 5m on each side of the TLOF.

(15) When Luminescent Panels are used on an elevated heliport or helideck to enhance surface texture cues, the panels shall not be placed adjacent to the perimeter lights but shall be placed around a touchdown marking or coincident with a heliport identification marking.]

[(16)] (6) TLOF floodlights shall be **[located]** arranged so as to avoid glare to pilots in flight **[or]** and to personnel working on the area. **[The arrangement and aiming of floodlights shall be such that shadows are kept to a minimum.]**

[(17)] (7) The TLOF perimeter lights shall be fixed omnidirectional lights showing green.

[(18)] (8) At a surface level a heliport, ASPSL or LPs shall emit green light when used to define the perimeter of the TLOF.

[(19) The chromaticity and luminance boundaries of colours of LPs shall be as indicated in Appendix 1, Table A1-6.

(20) A Luminescent Panel shall have a minimum width of 6cm and the panel housing shall be the same colour as the marking it defines.]

[(21)] (9) For a surface level or elevated a heliport, the TLOF perimeter lights located in a FaTo shall not exceed a height of 5cm and shall be inset when a light extending above the surface could endanger a helicopter operation.

[(22) (10) For a helideck or shipboard a heliport, the TLOF perimeter lights and floodlights shall not exceed a height of 5cm.

[(23)] (11) For a coincidental FaTo or TLOF, the perimeter lights and floodlights shall not exceed 15cm.

[(24)] (12) When located within the safety area of a surface level or elevated a heliport, the TLOF floodlights shall not exceed a height of 25cm.

[(25)] (13) The ASPSL and Luminescent Panels shall not extend above the surface by more than 2.5cm.

[(26)] (14) The light distribution of the perimeter lights shall be as shown in figure 35, illustration **[6]** 2.

[(27) The light distribution of the LPs shall be as shown in figure 35, illustration 7.]

[(28)] (15) The spectral distribution of TLOF area floodlights shall be such that the surface and obstacle marking can be correctly identified.

[(29) The average horizontal illuminance of the floodlighting shall be at least 10 lux, with a uniformity ratio of not more than 8:1 measured on the surface of the TLOF.

(30) Lighting used to identify the TDPC shall comprise a segmented circle of omnidirectional ASPSL strips showing yellow.

(31) The segments shall consist of ASPSL strips and the total length of the ASPSL strips shall not be less than 50 percent of the circumference of the circle.]

[(32)] (16) If utilized, a heliport identification marking lighting, or cross marking lighting at a hospital, shall be omnidirectional showing green.".

AMENDMENT OF SA-CATS 140

11. Document SA-CATS 140 is hereby amended by:

(a) the substitution of Document SA-CATS 140 of the following Document:

"**140.01.2 ESTABLISHMENT OF SAFETY MANAGEMENT SYSTEM**

1. General

(1) The entity shall establish a SMS as provided in Regulation 140.01.2 and TS, in an acceptable manner to the Authority, for the control and supervision of the product or services covered by the operation.

(2) Additionally, in respect of an aerodrome, to the extent that there is no conflict with these technical standards, the requirements as further prescribed in relevant documents.

(3) An SMS shall be capable of delivering compliance with Part 140 and these technical standards at a level commensurate with the system description of the operator and operation.

(4) An entity shall perform a gap analysis to assess the current state of safety management system and devise an implementation plan to address any identified deficiencies, detailing the implementation of missing components or elements of SMS. Implementation plan shall be acceptable to the Authority.

(5) An SMS shall aim to implement –

(a) a mechanism for the timely resolution of safety issues on both a short- and long-term basis and where safety issues are proven to be systemic, an effective way of precluding the likelihood of recurrence;

(b) a safety information reporting system that is non-punitive in nature and capable of assuring anonymity and protection for the person providing the information; and

(c) an audit programme to continuously monitor the programme being implemented to provide critical assessment as to the effectiveness of such a programme.

(6) An entity referred to in Regulation 140.01.1 may combine safety and quality functions in one office. Entities shall demonstrate how the conflict of interest will be addressed, where applicable.

Note: Further guidance on ICAO requirements, which have been incorporated into this technical standard are contained in the 4th amendment of ICAO Doc 9859.

140.01.3 REQUIREMENTS OF SAFETY MANAGEMENT SYSTEM

1. Components and elements of a safety management system

Safety Policy & Objectives

(1) An entity shall develop, document, implement and maintain a current safety policy.

(2) The policy referred to in subsection (1) shall-

(a) reflect organisational commitment regarding safety as primary responsibility of all managers, including the continuous improvement of the level of safety performance, compliance with regulatory requirements and the promotion of a positive safety culture;

(b) include a clear statement about the provision of the necessary resources for the implementation of the safety policy and achievement of safety objectives;

(c) promote a positive reporting safety culture to encourage the reporting of safety issues;

(d) promote a disciplinary policy that outlines acceptable and unacceptable behaviours with regards to aviation activities;

(e) be signed by the accountable manager;

(f) be communicated throughout the organisation;

(g) be reviewed periodically (at least 2 years) to ensure it remains relevant;

(h) include a policy on the protection of safety data and safety information; and

(i) include safety reporting procedures;

2. Safety Objectives

(1) An entity shall develop, document, implement and maintain current safety objectives in support of the safety policy.

(2) The safety objectives shall:

(a) form the basis of the safety performance monitoring and measurement of the safety policy;

(b) define what an entity aims to achieve in terms of safety;

(c) include a combination of process orientated and outcome orientated objectives;

(d) be reflective of an entity's safety priorities;

(e) be communicated throughout the organisation;

(f) be periodically reviewed to ensure they remain relevant. A review may be triggered by an entity's current safety risks, inputs from safety analysis and a response to major changes in the operation;

(g) be developed by senior management and documented and signed off by the accountable manager; and

(h) be further enhanced with the establishment of specific safety performance indicators and targets that an entity intends to achieve.

(3) Safety objectives, indicators and targets shall be accepted by the Authority and an entity shall maintain sufficient records to prove that they monitor their performance against their safety performance targets.

(4) Safety policy and objectives shall outline the principles, processes and methods of an entity's SMS to achieve the desired safety outcomes. The policy and objectives shall establish senior management's commitment to safety, its goals and supporting organisational structure.

3. Safety Accountabilities and responsibilities

(1) An entity shall –

(a) identify the accountable manager who irrespective of other functions, is accountable on behalf of the entity for the implementation and maintenance of an effective SMS to ensure safety performance of internal and external organisations supporting their activities;

(b) clearly define lines of safety accountability throughout the entity, including a direct accountability for safety on the part of management;

(c) identify the safety responsibilities of all members of management and employees with respect to the safety performance of the organisation;

(d) document and communicate safety accountability, responsibilities, and authorities throughout the organisation; and

(e) define the levels of management with authority to make decisions regarding safety risk tolerability.

(2) An accountable manager shall -

(a) have the ultimate responsibility over the safe operation of an entity;

(b) be situated at the highest level of an entity, thus ensuring that right strategic safety decisions are made and that the SMS is effective; and

(c) have the final authority for the resolution of safety issues.

(3) In the case where SMS applies to several approvals that are part of the same entity:

(a) there shall be a single accountable manager; or

(b) an accountable manager should be identified for each approval and clear lines of accountability defined and coordinated.

(4) Accountabilities, responsibilities and authorities of the accountable manager and all members of management shall-

(a) be articulated in an SMS manual and included in an organogram;

(b) be reflected in the job descriptions;

(c) be communicated throughout an entity;

(d) be allocated in such a way that conflict of interest between individual's responsibilities and other entity's responsibilities is averted; and

(e) include allocation of resources to ensure effective performance of the system.

(5) The day-to-day operation of an SMS may be delegated, however the accountable manager cannot delegate responsibility or decisions regarding safety risks. Accountable manager's accountabilities include:

(a) ensuring safety policy and safety objectives are communicated;

(b) ensuring necessary allocation of resources (financial, human, training, acquisition);

(c) setting the acceptable safety risk limits and resourcing of the necessary controls;

(d) promoting a safety culture;

(e) ensuring appropriate actions are taken to address safety issues and safety risks;

(f) ensuring accidents and incidents are investigated;

(g) ensuring that an SMS is properly implemented and performing to requirements; and

(h) ensuring the continuous improvement of an SMS.

(6) An accountable manager has the authority:

(a) to make decisions on behalf of an entity;

(b) over all safety issues; and

(c) over operations under the approval of an entity and to stop operations or activities.

4. Accountability and responsibilities in respect to external organisations

(1) An entity shall be accountable for safety performance of products or services provided by external organisations or contractors supporting its activities, if such organisations are not required to establish and implement an SMS. Therefore, the entity shall-

(a) identify and document external interfaces;

(b) ensure that interfaces are defined within the system description which is included in the SMS documentation.

(c) manage and monitor interfaces to ensure safety provision of products and services. The hazards related to interfaces shall be identified. The associated safety risk assessment shall be completed, and appropriate safety risk control implemented;

(d) ensure effective coordination with organisations to clarify each party's role and responsibilities. Agree on actions to be taken and identify safety information that needs to be shared and communicated; and

(e) ensure that all safety issues or safety risks related to interfaces are documented and made accessible to the organisation for sharing and review.

Note 1: It is advisable to establish formal agreements through service level agreements to ensure that interfaces are managed effectively.

Note 2: System is an array of components built or assembled together to establish a common desired output, system shall interface and interact with other system both internally and externally of which along that a source of hazards will be created and thus, will necessitates risks control. This interface will enable an entity to gain more control over risks related to the interfaces if relationships are defined.

5. Appointment of key safety personnel

(1) An accountable manager shall appoint a competent person to fulfil the role of safety manager, who is responsible for the implementation and maintenance of an effective SMS. A safety manager shall be accountable to the accountable manager.

(2) A safety manager shall have direct access to an accountable manager in order to keep the accountable manager informed on safety matters.

(3) A safety manager shall have a working knowledge of product or service delivery.

(4) The appointment shall consider the potential conflicts of interest with other tasks and functions, conflicts of interest may include the following:

(a) competition for funding;

(b) conflicting priorities for resources; and

(c) where a safety manager has an operational role and the ability to assess the effectiveness of an SMS of the operational activities.

(5) Competencies of a safety manager shall include, but not limited to the following:

(a) safety or quality management experience;

(b) operational experience related to the product or service provided by the organisation;

(c) technical background to understand the systems that support operations, or the products or service provided;

(d) interpersonal skills;

(e) analytical and problem-solving skills;

(f) project management skills;

(g) oral and written communication skills; and

(h) understanding human factors.

Note: An entity shall ensure that an appointed safety officer or manager meet operational requirements as per the entities' approval. Competencies below are in the context of performing safety management responsibilities.

(6) The functions performed by the safety manager include but not limited to the following:

(a) managing the SMS implementation plan on behalf of the accountable manager;

(b) perform or facilitate hazard identification and safety risk analysis;

(c) collecting and analysing safety information in a timely manner;

(d) administering any safety related surveys;

(e) monitoring and evaluating the results of corrective actions;

(f) ensuring that risk assessments are conducted when applicable;

(g) monitoring the industry for safety concerns that could affect the organisation;

(h) being involved with actual or practice emergency responses, where applicable;

(i) being involved in the development and updating of the emergency response plan and procedures where applicable;

(j) provide independent advice on safety matters;

(k) plan and facilitate safety training; and

(l) ensuring safety-related information, including organisational goals and objectives, are made available to all personnel through established communication processes.

(7) Additional functions of a safety manager may also include, but not limited to:

(a) Monitor corrective actions and evaluate their results if this is not delegated to a SRB;

(b) provide periodic reports on an entity's performance;

(c) maintain SMS documentation and records;

(d) ensure that lessons learned from investigations and case histories or experiences, both internally and externally from other organisations are distributed;

(e) monitor safety concerns in aviation industry and their perceived impact on an entity's performance;

(f) coordinate and communicate safety issues within an entity as well as with external organisations including the Authority on issues relating to safety; and

(g) monitor the safety data collection and processing systems to ensure prompt collection and analysis of safety data and appropriate distribution within the entity of related safety information such that safety risk decisions and controls, as necessary, can be made.

6. Safety Review Board

(1) An entity shall establish a SRB to support the SMS functions across the entity. A SRB is a high-level board that considers matters of strategic safety importance. A SRB:

(a) provides the platform to achieve objectives of resource allocation and to assess the effectiveness and efficiency of risk mitigations strategies;

(b) is chaired by the accountable manager and composed of senior managers, including managers responsible for functional areas as well as those from relevant administrative departments;

(c) A safety manager shall participate in a SRB; and

(d) A SRB shall meet periodically, at least once every 3 months, or as often as possible.

(2) Functions of a SRB include, but not limited to the following:

(a) monitoring the effectiveness of a SMS;

(b) providing strategic directions to improve safety performance;

(c) monitoring that any necessary corrective action is taken in a timely manner;

(d) monitoring safety performance against the organisation's safety policy and objectives;

(e) monitoring the effectiveness of the organisation's safety management processes which support the declared corporate priority of safety management and promotion of safety across the organisation;

(f) monitoring the effectiveness of the safety supervision of subcontracted operations;

(g) monitoring overall effectiveness of safety risk mitigation strategies;

(h) ensuring that appropriate resources are allocated to achieve safety performance beyond that required by regulatory compliance; and

(i) monitoring the effectiveness of the entity's safety management processes which supports:

(i) the safety priorities of an entity; and

(ii) promotion of safety across an entity.

7. Safety Action Group

(1) A SRB may establish a SAG based on the system description. A SAG is a tactical group that deal with specific implementation issues in accordance with strategies developed by a SRB.

(2) A Departmental SAG shall be established when there is a need to:

(a) monitor operational safety performance within a functional area of an entity and ensure that an appropriate SRM activities are carried out;

(b) review available safety data and identify the implementation of appropriate safety risk control strategies to ensure employee feedback is provided;

(c) assess the impact related to the introduction of operational changes or new technologies;

(d) coordinate the implementation of any actions related to safety risk controls and ensure that actions are taken promptly;

(e) monitor safety promotion activities as necessary to increase awareness of safety issues among relevant employees, and to ensure that employees are provided appropriate opportunities to participate in safety management activities; and

(f) review the effectiveness of specific safety risk controls.

(3) An established SAG:

(a) may be a standing group or an ad hoc group;

(b) should be composed of front-line managers and front-line personnel;

(c) should be chaired by a designated line-manager; and

(d) should take direction from and report to the SRB.

8. Coordination of emergency response planning

(1) Where applicable and in other parts of the regulations other than Part 140, an entity shall develop, coordinate and maintain an aviation emergency response plan (ERP) that ensures orderly and efficient transition from normal to emergency operations, and return to normal operations.

(2) An entity shall ensure that its emergency response plan is properly coordinated with the emergency response plan (ERP) of those entities it interfaces with during the provision of this service.

(3) An entity shall meet those requirements for aviation emergency response planning and contingency planning as required by the regulations under which their certificates of operation are issued (e.g. aerodrome operators comply with Regulation 139).

(4) An ERP shall address foreseeable emergencies as identified through an SMS and include mitigating actions, processes and controls to effectively manage aviation related emergencies.

(5) An ERP shall be documented in a format of a manual or directly integrated into the SMS manual. If an ERP is documented in a separate manual, it shall be cross-linked to the SMS manual.

(6) An ERP shall be reflective of the nature and complexity of the operations of the entity.

9. SMS Documentation

(1) An entity shall develop an SMS implementation plan that defines an entity's approach to the management of safety in a manner that meets an entity's safety objectives.

(2) An entity shall develop and maintain a SMS manual that describes an entity's SMS policy, processes and procedures to facilitate the organisation's internal administration, communication and maintenance of a SMS.

(3) A SMS manual shall be:

(a) endorsed or approved by an accountable manager; and

(b) approved by the Authority.

(4) A SMS manual may be a stand-alone document or may be integrated to other documents maintained by an entity.

(5) An entity's SMS processes addressed in existing documents shall be cross referenced and reflected in a SMS manual.

(6) The SMS manual should help personnel to understand how the entity's SMS functions, and how the safety policy and objectives will be met.

(7) The documentation should include a system description that provides the boundaries of SMS. It should clarify the relationship between various policies, processes, procedures and practices, and define how these link to an entity's safety policy and objectives.

10. Contents of the manual

(1) A SMS manual shall have a detailed description of an entity's policies, processes and procedures, include the following where applicable:

(a) safety policy and objectives;

(b) reference to any applicable regulatory SMS requirements;

(c) system description;

(d) safety accountabilities and key safety personnel;

(e) voluntary, mandatory and confidential safety reporting system processes and procedures;

(f) hazard identification and safety risk assessment processes and procedures;

(g) safety investigation procedures;

(h) procedures for establishing and monitoring safety performance indicators;

(i) SMS training processes, procedures and communication;

(j) safety communication processes and procedures;

(k) internal audit procedures;

(l) management of change procedures;

(m) SMS documentation management procedures; and

(n) coordination of emergency response planning.

11. SMS operational records

(1) An entity shall develop and maintain SMS operational records as part of its SMS documentation.

(2) The SMS documentation shall include the compilation and maintenance of operational records substantiating the existence and ongoing operation of the SMS.

(3) Operational records are the outputs of the SMS processes and procedures such as the SRM and safety assurance activities.

(4) SMS operational records shall be stored and kept in accordance with existing retention periods.

(5) SMS operational records shall include but not limited to the following where applicable:

(a) hazards register and hazard or safety reports;

(b) safety performance indicators, targets and related charts;

(c) record of completed or in-progress safety risk assessments;

(d) SMS internal review or audit records;

(e) internal audit records;

(f) records of SMS or safety training records and safety promotion records;

(g) SMS or safety committee meeting minutes such as the SRB and SAG;

(h) SMS implementation plan (during the initial implementation); and

(i) gap analysis to support the implementation plan.

12. Changes to the SMS manual

(1) An entity shall submit its SMS manual to the Authority if the following occurs:

(a) change of the accountable manager and safety manager, unless both positions have already been accepted by the Authority through other regulation requirements;

(b) changes to an entity's organogram that affect safety reporting lines or an accountable manager's responsibilities;

(c) changes due to the re-allocation of accountabilities, responsibilities or authorities; and

(d) major operational changes.

13. Safety risk management

Hazard Identification

(1) An entity shall develop, document, implement and maintain a process that collects, records, identifies, acts and feedbacks on hazards associated with its aviation products or services.

(2) The hazard identification shall be based on a combination of reactive and proactive methods.

(3) An entity shall consider various sources for hazard identification including safety reporting systems, especially the voluntary and confidential safety reporting system.

Note: The mandatory system is normally used for incidents that have occurred, whereas the voluntary system provides an additional reporting channel for potential safety issues such as hazards, errors, or other human factors related issues. They can provide valuable information to the organisation on lower consequence events.

(4) The safety risk management process shall:

(a) determine the safety data and safety information to be collected, to support the safety performance management process and make safety decisions;

(b) collect and store safety data obtained from direct sources, both internal and external;

(c) clearly define the responsibilities for the identification of hazards for the entire chain of services within the system and including external organisations, without gaps or overlaps

(d) ensure the entity is knowledgeable about the safety risks induced by activities of its subcontractor;

(e) document sources used for hazard identification;

(f) ensure the protection of safety data, safety information and related sources in accordance with **Appendix A;**

(g) be systematically conducted on all sources employed and where possible, carried out as a joint exercise with the interfacing organisations;

(h) ensure effective coordination among departments or divisions as necessary to streamline efforts for reporting and collecting safety data to avoid duplications; and

(i) document hazards and their potential consequences and shall categorise safety data using taxonomies and supporting definitions so that the data can be captured and stored using meaningful terms.

14. Hazards related to SMS interfaces with external organizations

(1) An entity shall identify hazards related to their safety management interfaces. as a recommendation, be carried out as a joint exercise with the interfacing organizations.

(2) The hazard identification shall consider the operational environment and the various organizational capabilities (people, processes, technologies) which could contribute to the safe delivery of the service or product's availability, functionality or performance.

15. Internal Safety Reporting

(1) The internal safety reporting system shall:

(a) facilitate the collection and evaluation of errors, hazards and incident or safety occurrences reported internally;

(b) ensure corrective and preventative actions are taken to address any safety issues and hazards;

(c) ensure feedback to the entity's safety training, whilst maintaining appropriate confidentiality;

(d) provide feedback to the reporter on what actions have been taken. This is to ensure support to the internal safety reporting system and disseminate the results to other relevant parties. This will promote safety culture and promote future reporting;

(e) have appropriate protections and a non-punitive approach which encourages safety reporting within a system that clearly indicates which types of behaviours are unacceptable;

(f) be confidential for voluntary safety reporting system;

(g) be accessible to personnel at all levels and across all disciplines, including interfacing organisations where applicable;

(h) be promoted to ensure that everyone is made aware of the benefits of safety reporting and what should be reported;

(i) preferably use a taxonomy;

(j) record all identified hazards and their potential consequences; and

(k) use structured decision-making approach with defined criteria points to initiate an investigation, including occurrences and hazards considered to have a high-risk potential.

(2) The internal reporting system shall allow the effective application of investigation process to:

(a) identify factors contributing to occurrences to reduce the likelihood of reoccurrence and severity;

(b) identify adverse trends;

(c) identify those reports which require further investigation; and

(d) conclude with clearly defined findings, root causes, including any technical, organisational, managerial or human factor issues, and any other contributing factors leading to the event and recommendations that eliminate or mitigate safety deficiencies.

(3) Depending on the hazard identification sources and the approach to hazard identification, the following methods for hazard identification may be used:

(a) *Reactive hazard identification methods* - hazards are recognised through trend monitoring and investigation of safety occurrences. Incidents and accidents are clear indicators of systems' deficiencies and should be therefore investigated to determine the hazards that played role in that event.

(b) *Proactive hazard identification methods* - hazards are identified by analysing systems' performance and functions for intrinsic threats and potential failures. The most commonly applied proactive methods are safety surveys, operational safety audits, safety monitoring and safety assessments. Other methods, such as Flight Data Analysis (FDA), specifically designed to track normal operations (trends), and Line Operations Safety Audit (LOSA) and Normal Operations Safety Survey (NOSS) designed to capture real life strategies (i.e. human performance), play an important role in proactive hazard identification.

16. Risk assessment and mitigation process

(1) An entity shall develop, document, implement and maintain a formal risk management process that ensures analysis (in terms of probability and severity of occurrence), assessment (in terms of tolerability or acceptability) and control (in terms of mitigation) of risks to an acceptable level.

(2) An entity shall:

(a) ensure that the process of gathering and aggregation of available data is in place. Such data shall be analysed to identify and document potential hazards as well as risks;

(b) develop a safety risk assessment model and procedures which will allow a consistent and systematic approach for the assessment of safety risks. This shall include a method that will help determine what safety risks are acceptable or unacceptable and to prioritise actions;

(c) demonstrate its commitment to safety information sharing and exchange; and

(d) employ data driven decision making methods for the management of its safety performance.

(3) Using the matrixes in **Appendix B:**

(a) clearly define the responsibilities for the management of associated safety risks for the entire chain of services within the system (including external contractors) without gaps or overlaps; and

(b) engage in data driven decision making process to determine safety priorities and the required risk controls. The prioritisation process shall consider the following:

(i) assessment and control of highest safety risks in terms of probability and severity (as per the matrix in tables 1 and 2);

(ii) allocation of resources to the highest safety risks;

(iii) achievement of stated and agreed safety objectives, safety targets and safety indicators; and

(iv) satisfaction of regulatory requirements with regards to the control of safety risks.

(4) Subject matter operational personnel and subject matter experts shall be involved in the determination of appropriate safety risk control.

(5) An entity shall document the SRM outputs.

(6) An entity shall establish procedures for the development and implementation of corrective actions which shall result in a specific corrective action plan that addresses:

(a) the development and proposal of the corrective action;

(b) the analysis and final approval level of the corrective action plan, including who is responsible for approval of the corrective action;

(c) who shall implement the corrective action;

(d) how the corrective action will be implemented;

(e) the corrective action due date;

(f) who shall evaluate the outcome, including the identification of required data, awareness of the possibility of unintended consequences and events that should trigger a response;

(g) who shall monitor the status of the correction action; and

(h) reporting the status of the corrective action.

(7) An entity shall periodically review SRM processes to ensure suitability.

(8) The results of safety data analysis shall highlight areas of high safety risk and assist decision makers to:

(a) make timeous corrective actions;

(b) implement safety risk-based surveillance;

(c) define or refine safety policy or safety objectives;

(d) define or refine safety performance indicators;

(e) define or refine safety performance targets;

(f) set Safety Performance Indicators triggers;

(g) promote safety; and

(h) conduct further safety risk assessment.

17. Safety assurance

Monitoring and measurement of safety performance

(1) An entity shall develop, implement and maintain current and appropriate means to -

(a) verify the safety performance; and

(b) validate the effectiveness of safety risk controls.

(2) The established process shall:

(a) monitor the safety objectives to ensure that they remain appropriate and current with an entity's strategy and priorities;

(b) select and define Safety Performance Indicators which are tactical parameters related to the safety objectives;

(c) set and define Safety Performance Indicators, if appropriate, which are also tactical parameters used to monitor progress towards the achievement of the safety objectives. When Safety Performance Indicators are established, they shall be realistic, context specific and achievable taking into account the resources available to an entity;

(d) include a process of acceptance of Safety Performance Indicators, Safety Performance Targets and the associated alert levels required by the Authority after it has been demonstrated that they are appropriate with:

(i) established safety objectives;

(ii) the analysis of available data; and

(iii) the size and complexity of the entity.

(e) monitor the performance of established Safety Performance Indicators, Safety Performance Targets and associated alert levels to identify abnormal changes in safety performance. Including an update of safety objectives, refinement of Safety Performance Indicators, and Safety Performance Targets and periodically review the appropriateness of Safety Performance Indicators and Safety Performance Targets.

18. Initial Acceptance of Safety Performance Indicators

(1) An entity shall propose Safety Performance Indicators for the review and acceptance by the Authority as part of the initial acceptance of SMS.

(2) The Authority may consider planning the acceptance of Safety Performance Indicators later in the implementation process. This is applicable to an entity that is at initial certification because it does not have sufficient data to develop meaningful Safety Performance Indicators;

(3) The acceptance of Safety Performance Targets may be addressed after the Safety Performance Indicators have been monitored over a period of one year. This establishes the baseline performance. It may be based on targets established at the national, regional or global level;

(4) The initial acceptance of Safety Performance Indicators, Safety Performance Targets, associated alert levels and corrective action plans shall be appropriate and pertinent to an entity's aviation activities prior to acceptance;

(5) The acceptance shall be between the Authority's principal inspector and the entity. The principal inspector shall review the proposed Safety Performance Indicators, Safety Performance Targets, alert levels and implementation plan to ensure that:

(a) they are appropriate and relevant to an entity's activities;

(b) their development has used appropriate measuring matrix; and

(c) consistent with the Authority's national aviation safety priorities.

19. Continuous acceptance

(1) An entity shall, on a quarterly basis, demonstrate to the Authority that the Safety Performance Indicators, Safety Performance Targets and associated alert levels and implementation plans are appropriate and relevant to an entity's aviation activities.

(2) The Authority shall be notified immediately of any changes to Safety Performance Indicators, Safety Performance Targets, alert levels and implementation plans.

20. Internal audit

(1) Internal audits shall be conducted to assess and provide an accountable manager and senior management with feedback on the status of:

(a) compliance with CARs and CATS;

(b) compliance with policies, procedures and processes;

(c) effectiveness of safety risk controls;

(d) effectiveness and implementation status of implementation plans and corrective action plans;

(e) effectiveness of SMS; and

(f) opportunities for improvement.

(2) Internal audits should be conducted by persons or departments independent of the functions being audited;

(3) Planning of internal audits shall take into account the results of the previous audits and assessments and implemented safety risk controls;

(4) The results from the analysis of causes and contributing factors for any non-compliance shall feed into the organisation's SRM processes.

21. Management of change

(1) An entity shall develop, document, implement and maintain the current process to:

(a) identify changes which may affect the level of safety risk associated with its aviation products or services and;

(b) identify and manage the safety risks that may arise from those changes.

(2) An entity shall establish a process aimed at identifying internal and external changes that may have an adverse effect on safety before implementation and aim at defining the changes that would require a comprehensive management of change process.

(3) One of the following changes should trigger a comprehensive management of change process:

(a) introduction of new technology or equipment;

(b) changes in the operating environment;

(c) changes in key personnel;

(d) significant changes in staffing levels;

(e) changes in regulatory requirements;

(f) exemptions or alternative means of compliance;

(g) significant changes in an organisation's policies, procedures and manuals;

(h) changes in the scope of organisations' certificate;

(i) significant restructuring of an entity; and

(j) physical changes such as new facility or base, aerodrome layout changes.

(4) An entity shall establish a management of change process which includes:

(a) understanding and defining the change; this shall include a description of the change and why it is being implemented. This activity shall assist an entity to evaluate the criticality of the change by assessing the impact on its activities, and the impact on other entities and aviation system;

(b) understanding and defining who and what it will affect; including individuals within an entity, other departments and external people and entities. Equipment, systems and processes may also be impacted. A review of the system description and organisations' interfaces may be needed. This is an opportunity to determine who should be involved in the change. Changes may also affect risk controls already in place to mitigate other risks, and therefore change could increase or introduce risks in areas that are not immediately obvious;

(c) identifying hazards related to the change and carry out a safety risk assessment; this shall identify any hazards directly related to the change. The impact on existing hazards and safety risk controls that may be affected by the change shall also be reviewed. This activity shall use an existing entity's SRM processes since it is intended to collect data and information that can be used to give information on the situation and enable analysis for the change;

(d) developing an action plan shall define what needs to be done, by whom and by when. There shall be a clear plan describing how the change will be

implemented and who will be responsible for which actions, and the sequencing and scheduling of each task;

(e) sign off on the change, this is to confirm that the change is safe to implement. The individual with overall responsibility and authority for implementing the change shall sign the change plan; and

(f) an assurance plan. This is to determine what follow-up action is needed. Consider how the change will be communicated and whether additional activities, such as audits, are needed during or after the change.

22. Continuous improvement of SMS

(1) An entity shall develop, document, implement and maintain a formal and current process to monitor, assess, continuously improve SMS performance, processes and activities.

(2) The internal evaluation process shall evaluate safety management functions, procedures, policies, risk management processes, safety assurance processes and safety promotion activities throughout the entity and feedback shall be provided to the accountable manager and senior management with highlights of opportunities for improvement.

(3) The process shall include the following methods:

(a) audits, this includes internal audits and audits carried out by external parties;

(b) assessments, this includes assessments of safety culture and SMS effectiveness;

(c) monitoring of accidents and incidents, errors and violations;

(d) safety surveys;

(e) management reviews to examine whether safety objectives are being achieved by an entity;

(f) evaluation of Safety Performance Indicators and Safety Performance Targets; and

(g) address lessons learned from safety reporting systems and safety investigations.

(4) An entity shall establish an audit schedule and the audit shall be conducted annually.

23. Safety Promotion

Training and education

(1) An entity shall develop, document, implement and maintain a formal and current safety training and education programme that ensures that all safety related personnel are trained and competent to perform their duties and that facilitates effective two-way communication throughout all levels of an entity.

(2) The scope of the safety training and education programme shall be appropriate to the individual's safety accountabilities, responsibilities and authorities within an entity as outlined in **Appendix C** (in-house SMS Training levels).

(3) An SMS manager and approved SMS instructors shall undergo full scope SMS training once within a 3-year period at a Part 141 organisation or institution approved by the Director or an acceptable aviation entity.

(4) The safety training and education programme shall, at a minimum include:

(a) the list of staff who should be trained and to what depth and give due consideration to external interfacing organisations;

(b) the policy for initial safety training and education programme for the accountable manager, post holders, managers, supervisors, and all other safety related personnel;

(c) a policy for the staff's ongoing safety knowledge and competency needs; these needs will be met through a recurrent training and education programme;

(d) a policy to ensure that each staff has access to up-to-date safety information to fulfil their safety responsibilities and can voluntarily request additional training;

(e) the appropriate method for training delivery including competent trainers whose commitment, teaching skills and safety management expertise will have a significant impact on the effectiveness of the training delivered;

(f) a process with clear responsibilities for:

(i) the development and maintenance of training and education content based on the international best practise and SMS's outputs and outcomes;

(ii) the scheduling of training activities;

(iii) the periodical review of the training and education programme; and

(iv) ensuring that personnel, at all levels of the organisation, maintain their competency to fulfil their safety roles; therefore, competencies of personnel shall be reviewed regularly;

(g) tailor the needs of the individual's role within an entity and be commensurate with the accountabilities, responsibilities, and authorities the individuals hold. The level and depth of training for managers involved in an entity's safety committees will be more extensive than for personnel directly involved with the delivery of an entity's product or services. The safety training for the accountable manager, post holders and senior managers includes the following topics:

(i) specific awareness training for new accountable managers and post holders on their SMS accountabilities, responsibilities and authorities;

(ii) importance of compliance with national and an entity's safety requirements;

(iii) management commitment towards safety improvement and compliance, with the understanding of the SMS and its relationship to an entity's overall business strategy;

(iv) allocation of resources;

(v) promotion of safety policy, safety objectives and the SMS;

(vi) promotion of a positive safety culture;

(vii) effective interdepartmental safety communication;

(viii) establishment of safety objectives, Safety Performance Targets, and alert levels; and

(ix) disciplinary policy;

(h) A safety department employee shall be provided with more detailed SMS training to enhance his or her competence in safety risk assessment, system evaluation, system assessment, data mining, auditing and inspections; and

(i) Be developed using formal training needs analysis to ensure a clear understanding of the operation, the safety duties of personnel and the available training.

(5) An organisation which may provide safety management system training:

(a) An ATO with Part 141 approval; and

(b) An international organisation which are recognised by the Director and the list of these international organisations is available upon request.

24. Safety Communication

(1) An entity shall develop, document, implement and maintain an effective safety communication strategy of safety related data or information by the most appropriate method and with consideration to the individual's role within an entity. The safety strategy shall:

(a) apply to internal and external communications;

(b) be clear, simple, practical and align with the safety policy and safety objectives; and

(c) Achieve, at minimum, the following objectives:

(i) ensure personnel are aware of the SMS to a degree commensurate with their position in a timely manner;

(ii) convey, in a timely manner safety-critical information that could expose the entity to safety risks;

(iii) raise awareness of new safety risk controls and corrective action and explain why particular safety actions are taken;

(iv) provide information on new or amended safety policy, objectives and procedures and explain why they are introduced or changed to ensure the appropriate people are kept informed;

(v) promote a positive safety culture among their systems and interfaces;

(vi) encourage personnel to identify and report hazards; and

(vii) provide feedback to personnel submitting a safety report.

140.02.2 MANDATORY OCCURRENCE REPORTING

1. Form and manner of reporting

(1) The safety reporting requirements shall be described and implemented to facilitate reporting of occurrences and perceived hazards to an area operational management or safety manager.

(2) Reporting procedures shall include management reporting and reporting to the Authority.

(3) An entity shall report any hazard with intolerable/high/unacceptable risk identified through its SMS to the Authority within thirty (30) days of it being verified through its SMS processes. The report shall include the mitigation actions taken to address the risk.

(4) A PIC, flight crew member or an entity shall report the following safety information to the Authority and in a manner prescribed by the Authority:

(a) aviation accidents as soon as possible but at least within 24 hours from the time of the accident;

(b) serious incidents as soon as possible but at least within 48 hours from the time of the incident or serious incident; and

(c) incidents as soon as possible but at least within 72 hours from the time of the incident and other safety related occurrences as per the schedule agreed with the Authority.

Appendix A

PRINCIPLES FOR THE PROTECTION OF SAFETY DATA, SAFETY INFORMATION AND RELATED SOURCES BY THE AUTHORITY

1. Principles of Protection

(1) Unless a principle of exception applies, the Authority shall ensure that safety data or safety information is not used for:

(a) disciplinary, civil, administrative and criminal proceedings against employees, operational personnel or entities;

(b) disclosure to the public; or

(c) any other purposes other than maintaining or improving safety;

(2) The Authority shall provide protection to safety data, safety information and related sources by ensuring:

(a) the protection is specified based on the nature of safety data and safety information;

(b) a formal procedure to provide protection to safety data, safety information and related sources is established and may include that any person seeking disclosure of safety data and safety information shall provide the justification for its release;

(c) safety data and safety information shall not be used in a way different from the purposes for which it was collected, unless a principle of exception applies;

(d) to the extent that a principle of exception applies, the use of safety data and safety information in disciplinary, civil, administrative and criminal proceedings shall be carried out only under authoritative safeguards.

2. Principles of exception

(1) Exceptions to the protection of safety data, safety information and related sources shall only be granted when the Authority:

(a) determines that there are facts and circumstances reasonably indicating that the occurrence may have been caused by an act or omission considered, in

accordance with national laws, to be a conduct constituting gross negligence, wilful misconduct or criminal activity;

(b) after reviewing the safety data or safety information, determines that its release is necessary for the proper administration of justice, and that the benefits of its release outweigh the adverse domestic and international impact such release is likely to have on the future collection and availability of safety and safety information; or

(c) after reviewing the safety data and safety information, determines that its release is necessary for maintaining or improving safety, and that the benefits of its release outweigh the adverse domestic and international impact such release is likely to have on the future collection and availability of safety data and safety.

3. Public disclosure

(1) Where disclosure is made in accordance with section 2, the Authority shall ensure:

(a) public disclosure of relevant personal information included in the safety data or safety information complies with applicable privacy laws; or

(b) public disclosure of the safety data or safety information is made in a de-identified, summarized or aggregate form.

4. Responsibility of the custodian of safety data and safety information

(1) The Authority shall ensure that safety data collection and processing systems (SDCPS) has a designated custodian to apply the protection to safety data and safety information and the custodian shall refer to an individual or organization.

Appendix B

Safety Risk Assessment Matrix

1. Safety risk probability

(1) Safety risk probability is the likelihood that a safety consequence or outcome will occur. It is important to envisage a variety of scenarios so that all potential consequences can be considered. The following questions can assist in the determination of probability:

(a) Is there a history of occurrences similar to the one under consideration, or is this an isolated occurrence?

(b) What other equipment or components of the same type might have similar issues?

(c) What is the number of personnel following, or subject to, the procedures in question?

(d) What is the exposure of the hazard under consideration? For example, during what percentage of the operation is the equipment or activity in use?

(2) Taking into consideration any factors that might underlie these questions will help when assessing the probability of the hazard consequences in any foreseeable scenario.

(3) An occurrence is considered foreseeable, if any reasonable person could have expected the kind of occurrence to have happened under the same circumstances. Identification of every conceivable or theoretically possible hazard is not possible. Therefore, good judgment is required to determine an appropriate level of detail in hazard identification. An entity shall exercise due diligence when identifying significant and reasonably foreseeable hazards related to their product or service.

2. Safety risk probability table

Table 1: Safety risk probability (to be considered together with the safety risk severity table)

Likelihood/Probability	Meaning	Value
Frequent	Likely to occur may times (has occurred frequently)	5
Occasional	Likely to occur sometimes (has occurred frequently)	4
Remote	Unlikely to occur, but possible (has occurred rarely)	3
Improbable	Very unlikely to occur (not known to have occurred)	2
Extremely improbable	Almost inconceivable that the event will occur	1

3. Safety risk severity

(1) Once the probability assessment has been completed, the next step is to assess the severity, taking into account the potential consequences related to the hazard.

(2) Safety risk severity is defined as the extent of harm that might reasonably be expected to occur as a consequence or outcome of the identified hazard.

(3) The severity classification shall consider:

(a) fatalities or serious injury which would occur as a result of:

(i) being in the aircraft;

(ii) having direct contact with any part of the aircraft, including parts which have become detached from the aircraft; or

(iii) having direct exposure to jet blast;

(b) damage or structural failure sustained by the aircraft which:

(i) adversely affects the structural strength, performance or flight characteristics of the aircraft; or

(ii) would normally require major repair or replacement of the affected component; or

(c) damage sustained by ATS or aerodrome equipment which:

(i) adversely affects the management of aircraft separation; or

(ii) adversely affects landing capability.

(4) The severity assessment should consider all possible consequences related to a hazard, taking into account the worst foreseeable situation.

(5) Table 2: Safety risk severity presents a typical safety risk severity table. It includes five categories to denote the level of severity, the description of each category, and the assignment of a value to each category.

Table 2: Safety risk severity

Severity	**Meaning**	**Value**
Catastrophic	• Aircraft or equipment destroyed • Multiple deaths	A
Hazardous	• A large reduction in safety margins, physical distress or a workload such that operational personnel cannot be relied upon to perform their tasks accurately or completely • Serious injury • Major equipment damage	B
Major	• A significant reduction in safety margins, a reduction in the ability of operational personnel to cope with adverse operating conditions as a result of an increase in workload or as a result of conditions impairing their efficiency • Serious incident • Injury to persons	C
Minor	• Nuisance • Operating limitations • Use of emergency procedures • Minor incident	D
Negligible	• Few consequences	E

4. Safety risk tolerability

(1) The safety risk index rating is created by combining the results of the probability and severity scores. Table 3 is an alphanumeric designator.

(2) The respective severity/probability combinations are presented in the safety risk assessment matrix in Tables 1 and 2. The safety risk assessment matrix is used to determine safety risk tolerability.

Consider, for example, a situation where the safety risk probability has been assessed as occasional (4), and the safety risk severity has been assessed as hazardous (B), resulting in a safety risk index of section 4.

Table 3: Safety risk tolerability

Safety Risk	**Severity**				
Probability/likelihood	**Catastrophic A**	**Hazardous B**	**Major C**	**Minor D**	**Negligible E**
Frequent 5	5A	5B	5C	5D	5E
Occasional 4	4A	4B	4C	4D	4E
Remote 3	3A	3B	3C	3D	3E
Improbable 2	2A	2B	2C	2D	2E
Extremely improbable 1	1A	1B	1C	1D	1E

The index obtained from the safety risk assessment matrix shall then be exported to a safety risk tolerability table that describes, in a narrative form, the tolerability criteria for a particular entity.

(3) Table 4 presents an example of a safety risk tolerability table. Using the example above, the criterion for safety risk assessed as 4B falls in the “intolerable” category. In this case, the safety risk index of the consequence is unacceptable.

(4) An entity shall therefore take risk control action to reduce:

(a) an entity’s exposure to the particular risk, i.e., reduce the probability component of the risk to an acceptable level;

(b) the severity of consequences related to the hazard, i.e., reduce the severity component of the risk to an acceptable level; or

(c) both the severity and probability so that the risk is managed to an acceptable level.

(5) Safety risks are conceptually assessed as acceptable, tolerable or intolerable.

(6) Safety risks assessed as initially falling in the intolerable region are unacceptable under any circumstances.

(7) The probability and severity of the consequences of the hazards are of such a magnitude, and the damaging potential of the hazard poses such a threat to safety, that mitigation action is required, or activities are stopped.

Table 4: Safety risk tolerability narrative

Safety risk index range	**Safety risk description**	**Recommended action**
5A, 5B, 5C, 4A,4B, 3A	Intolerable	Take immediate action to mitigate the risk or stop the activity. Perform priority safety risk mitigation to ensure additional or enhance preventative controls are in place to bring down the safety risk index to tolerable
5D, 5E, 4C, 4D, 4E, 3B, 3C, 3D, 2A, 2B, 2C, 1A	Tolerable	Risk can be tolerated based on safety risk mitigations in place. It may require management decision to accept the risk.
3E, 2D, 2E, 1B, 1C, 1D,1E	Acceptable	Risk is acceptable as is. No further risk mitigation required.

5. Safety risk mitigation strategies

(1) Safety risk mitigation is often referred to as safety risk control. Safety risks shall be managed to an acceptable level by mitigating the safety risk through the application of appropriate safety risk controls.

(2) This shall be balanced against time, cost and difficulty of taking action to reduce or eliminate the safety risk.

(3) The level of safety risk can be lowered by reducing the severity of the potential consequences, reducing the likelihood of occurrence or by reducing exposure to that safety risk.

(4) It is easier and more common to reduce the likelihood than it is to reduce the severity.

(5) Safety risk mitigations are actions that often result in changes to operating procedures, equipment or infrastructure. Safety risk mitigation strategies fall into three categories:

(a) *Avoidance*: The operation or activity is cancelled or avoided because the safety risk exceeds the benefits of continuing the activity, thereby eliminating the safety risk entirely.

(b) *Reduction*: The frequency of the operation or activity is reduced, or action is taken to reduce the magnitude of the consequences of the safety risk.

(c) *Segregation*: Action is taken to isolate the effects of the consequences of the safety risk or build in redundancy to protect against them.

(6) A safety risk mitigation strategy shall involve one of the approaches described above or may include multiple approaches. It is important to consider the full range of possible control measures to find an optimal solution. The effectiveness of each alternative strategy shall be evaluated before a decision is made. Each proposed safety risk mitigation alternative shall be examined from the following perspectives:

(a) *Effectiveness* - the extent to which the alternatives reduce or eliminate the safety risks. Effectiveness can be determined in terms of the technical, training and regulatory defences that can reduce or eliminate safety risks;

(b) *Cost benefit* - the extent to which the perceived benefits of the mitigation outweighs the costs;

(c) *Practicality* - the extent to which mitigation can be implemented and how appropriate it is in terms of available technology, financial and administrative resources, legislation, political will and operational realities;

(d) *Acceptability* - the extent to which the alternative is acceptable to those people that will be expected to apply it;

(e) *Enforceability* - the extent to which compliance with new rules, regulations or operating procedures can be monitored;

(f) *Durability* - the extent to which the mitigation will be sustainable and effective;

(g) *Residual safety risks* - the degree of safety risk that remains subsequent to the implementation of the initial mitigation and which may necessitate additional safety risk control measures;

(h) *Unintended consequences* - the introduction of new hazards and related safety risks associated with the implementation of any mitigation alternative; and

(i) *Time* - time required for the implementation of the safety risk mitigation alternative.

(7) Corrective action shall be cognisant of any existing defences and their ability or inability to achieve an acceptable level of safety risk. This may result in a review of previous safety risk assessments that may have been impacted by the corrective action.

(8) Safety risk mitigations and controls will need to be verified or audited to ensure that they are effective. Another way to monitor the effectiveness of mitigations is through the use of Safety Performance Indicators.

Appendix C

In-house SMS Training levels

	Level of training	Recipients	Training Objective	Training content	Recurrence	Level of Instructor
(a)	Aviation Safety content for Induction training.	Non-Operational staff within 90 days of service commencement.	To familiarise trainees with the Entities SMS safety policies, objectives and SMS fundamentals.	• The Safety Policy and Objectives • Hazards, consequences and risks. • Safety reporting.	Once off, 1 hour training during induction.	Company Instructor/safety manager/officer personnel or approved Part 141 organisation
(b)	Aviation Safety training for Operational personnel.	Within 90 days All operational staff of entities	To familiarise trainees with the entities safety policies, objectives, their role in hazard identification and risk management and SMS fundamentals.	• The Safety Policy and Objectives • Hazards, consequences and risks. • Safety risk management process, including roles and responsibilities. • Safety reporting. • Human factors	5 hours of training within each three year period	Company Instructor/safety manager/officer personnel or approved Part 141 organisation
(c)	Safety Review specific training as per	Entities personnel actively involved in the Safety Review	To familiarise trainees with safety concepts, relevant to	In addition to training contents referred to in (b) above,	5 hours of training within each	Company Instructor/safety manager/officer personnel

	CAR Part 141.01.1. (a)	Process, including middle, executive/senior management and accountable manager	their respective roles, functions and responsibilities including compliance with national and organisational safety requirements and inter-departmental safety communication and active promotion of SMS.	training should include the following: • Hazard identification and risk management processes. • Safety data collection and analysis. • Safety roles and responsibilities • Safety assurance and safety promotion • Establishment of safety performance targets, indicators, alerts and safety performance of SMS • The role and responsibilities of Operational management within the SMS.	three-year period	or approved Part 141 organisation

AMENDMENT OF SA-CATS 171

12. Document SA-CATS 171 is hereby amended by:

(a) the insertion after the Definitions of the following technical standard:

"**171.01.1 Applicability**

(1) This TS applies to—

(a) regulatory requirements and standards for the approval of ESO that intend to provide, operate, and maintain aeronautical telecommunications used for air traffic services, and radio-navigation services used for air navigation;

Note:

(a) Where an ESO has multiple regional technical operation centres which provides different services and due to the complexity and areas of responsibilities, each regional technical operation centre is required to establish its centre-specific Standard Operating Procedures (SOP) document that is aligned with Part 171 requirements. (See: 171.02.1: (2) to (4) and (6) to (7). The SOP will form part of the complete ESO MOP as addenda for evaluation and acceptance. The ESO MOP and centre-specific SOP shall be subjected to periodic audits as determined by the Director; and

(b) *operating and technical standards for aeronautical telecommunication services used for ATS, and aeronautical radio-navigation services used for air navigation.".*

AMENDMENT OF SA-CATS 172

13. Document SA-CATS 172 is hereby amended by transposing the ATS Standards and Procedure Manual (S&PM) which is currently published on the SACAA website to be inserted in Document SA-CATS 172 as Annexure F.

AMENDEMNT OF SA-CATS 173

14. Document SA-CATS 173 is hereby amended by:

(a) the substitution in technical standard 173.01.5 for section 1 of the following section:

"**1. Instrument Flight Procedure Design and Validation**

1.1 Ratings for instrument flight procedure design and ground validation approval

(1) The following is a list of the type of flight procedures included under each instrument flight procedure design or ground validation rating:

(a) conventional procedures:

(i) non-precision approach procedure;

(ii) precision approach procedure;

(iii) standard instrument departure (SID);

(iv) standard instrument arrival (STAR);

(v) enroute procedure; and

(vi) holding procedure;

(b) performance-based navigation procedures:

(i) non-precision approach procedure;

(ii) precision approach procedure and approach procedure with vertical guidance;

(iii) standard instrument departure (SID);

(iv) standard instrument arrival (STAR);

(v) en-route procedure; and

(vi) holding procedure.";

(b) the substitution in technical standard 173.01.14 for subsection (1) of the following subsection:

"(1) In accordance with CAR 173.01.14 (1)(a) and CAR 173.01.14 (3)(e), the following documents shall be kept for the following periods of time:

(a) electronic design and validation files – indefinitely;

(b) design and validation reports – indefinitely;

(c) superseded charts – indefinitely; and

(d) training file – ten years.".

(c) the substitution in technical standard 173.02.2 for section 4 (1) (b) and (c) of the following subsections:

"Minimum requirements for Qualified Designer

(2) The minimum requirements for a Qualified Designer required by CAR 173.02.2(4), are: -

(a) Qualifications: A Qualified Designer shall, as a minimum –

(i) have satisfactorily completed an approved training programme as prescribed in CAR 173.01.7(9);

(ii) have satisfactorily completed a course of in-service training in flight procedure design as detailed in the designer's operations manual;

(b) Experience: A Qualified Designer shall –

(i) have designed a minimum of one procedure for each of the instrument flight procedure types that are listed in TS 173.01.5;

(ii) have such procedures verified and approved by supervisory personnel; and

(iii) ensure that the period for designing the procedures listed in TS 173.01.5 does not exceed eighteen consecutive months.

(d) Recency

A Qualified Designer shall, in the preceding eighteen months, have designed a minimum of one procedure for each of the instrument flight procedure types that are listed in TS 173.01.5.";

(d) the substitution in technical standard 173.03.1 section 1 for subsection (1) of the following section:

"**1. Information contained in manual for operations approval**

(1) The information referred to in regulation 173.03.1 (1) (b), which must be contained in the operations manual of **[the]** an applicant, must include–

(a) a table of contents based on the items in the manual, indicating the page number on which each item begins;

(b) a description of the **[designer's]** instrument flight procedure ground validation approval holder's organisational structure and a statement setting out the functions that the **[designer]** instrument flight procedure ground validation approval holder performs, or proposes to perform under **[CAR]** Part 173;

(c) a list of the **[design]** ground validation services that the **[designer]** instrument flight procedure ground validation approval holder provides, or proposes to provide;

(d) a statement, for each **[design]** ground validation service, that identifies the location from where the service is provided, or proposed to be provided;

(e) a statement of the responsibilities and functions for each position;

(f) a description of the arrangements made or proposed to be made by the **[designer]** instrument flight procedure ground validation approval holder to ensure that it has, and will continue to **[be able to provide, information in connection with its design services to another person whose functions reasonably require that information]** receive, the information necessary for providing the service;

(g) a statement detailing any agreement entered into by the **[designer]** instrument flight procedure ground validation approval holder in relation to the provision of a **[design]** ground validation service provided by another party;

(h) a copy of the document that sets out the **[designer's]** instrument flight procedure ground validation approval holder's safety management system;

(i) a description of the **[designer's]** instrument flight procedure ground validation approval holder's training and checking program;

(j) a description of the procedures to be used in commissioning new facilities, equipment and services;

(k) a description of the procedures to be used to ensure that **[designs]** ground validations are completed in accordance with the **[drafting]** ground validation conventions contained in this document;

(l) a description of the format(s) that will be used for the issue of completed **[designs]** ground validations for approval **[publication]**;

(m) a description of the procedures to be used to ensure that all equipment, including software is operated in accordance with the manufacturer's operating instructions and manuals;

(n) **[the safety management system of the designer]** a description of the management structure established, or proposed to be established, by the instrument flight procedure ground validation approval holder;

(o) a description of the procedures to be used to conduct environmental assessments; **[and]**

(p) the procedures to be followed for revising the operations manual**[.]**;

(q) a description of the instrument flight procedure ground validation approval holder's record keeping system;

(r) a description of the processes and documentation used to present the relevant standards and recommended practices, regulations and technical standards to staff, and any of the instrument flight procedure ground validation approval holder's site-specific instructions for the provision of validation services;

(s) a description of the procedures to be followed to ensure all operational staff are familiar with any operational changes that have been issued since they last performed operational duties;

(t) a statement of the duties and responsibilities of each position within the organisational structure; and

(u) a statement on how the number of required operational staff is determined.";

(e) the substitution for technical standard 173.03.2 of the following sections:

"1. Qualified designer

1.1. Minimum requirements for chief validator

(1) The minimum requirements for qualification as a chief validator appointed in terms of regulation 173.03.2(2), are:

(a) the qualification and experience requirements of a qualified validator; and

(b) four years full time experience as a qualified validator.

1.2. Minimum requirements for supervisory personnel

(1) The minimum requirements for qualification as supervisory personnel appointed in terms of regulation 173.03.2(5), are:

(a) the qualification and experience requirements of a qualified validator; and

(b) two years full time experience as a qualified validator.

1.3. Minimum requirements for qualified validator

(1) The minimum requirements for qualification as a qualified validator appointed in terms of regulation 173.03.2(4), are:

(a) A qualified validator in terms of subsection (1) shall be in possession of the following minimum qualifications:

(i) have satisfactorily completed an approved training programme as provided in regulation 173.01.7(8);

(ii) have satisfactorily completed a course of in-service training in flight procedure design as detailed in the instrument flight procedure ground validation approval holder's operations manual;

(b) A qualified designer in terms of subsection (1) shall possess the following experience:

(i) have designed a minimum of one procedure for each of the instrument flight procedure types that are listed in TS 173.01.5.

(ii) have such procedures verified and approved by supervisory personnel.

(iii) ensure that the period for designing the procedures listed in TS 173.01.5 does not exceed eighteen consecutive months.

(c) Recency

A Qualified Designer shall, in the preceding eighteen months, have designed a minimum of one procedure for each of the instrument flight procedure types that are listed in CATS 173.01.5.";

(f) the deletion of technical standard 173.03.3.

(g) the substitution in regulation 173.03.4 section 1 for subsection (1) of the following subsection:

"(1) **[The holder]** A holder of an instrument flight procedure validation approval shall **[maintain]** validate each flight procedure, **[at periodic intervals and upon]** in accordance with the conditions prescribed in **[SA FPD Manual of Standards – Guidance Material for the Design and Submission of Flight Procedures]** the TGM for flight procedure design and cartography.".

AMENDMENT OF SA-CATS 175

15. Document SA-CATS 175 is hereby amended by the:

(a) the substitution in Technical Standard 175.03.4 section 6 for subsection (3) of the following subsections:

"(3) A NOTAM office shall allocate each a serial number identified by a letter (A, B **[and]**, C, D, E, F, G and H) and four digits followed by a stroke and two-digit numbers for the year. The four-digit numbers shall be consecutive and based on the calendar year.";

(b) the substitution in Technical Standard 175.03.4 section 6 after subsection (9) of the following subsections:

"(10) The G series NOTAM is information concerning UAV/RPAS/Model aircraft operations and given selected international distribution.

(11) The H series NOTAM is information of concern to Danger (FAD), Restricted (FAR) and Prohibited (FAP) areas and given selected international distribution.

(12) Each NOTAM shall be brief, deal with only one subject, and be compiled so that its meaning is clear without reference to another document to enable the interpretation of the NOTAM published.

(13) If a NOTAM contains information that requires an amendment to the South African AIP or an AIP Supplement or temporary information of long duration, the NOTAM shall contain a cross-reference to the affected AIP text or AIP Supplement.

(14) If a NOTAM is issued which cancels or supersedes a previous NOTAM, the serial number of the previous NOTAM shall be specified.

(15) If an error is detected in a NOTAM, a replacement NOTAM which cancels the original shall be issued.

(16) Location indicators included in the text of a NOTAM shall conform to those as prescribed in ICAO Document 7910. A curtailed form of such indicators shall not be used. If no location indicator is assigned to the location, the name of the place and the coordinates shall be entered in the text of the NOTAM.

(17) The NOTAM checklist shall be issued every month end and shall –

(a) refer to the latest AIP Amendments, AIP Supplements and AIC; and

(b) have the same distribution as the actual NOTAM series to which the checklist refers and shall be clearly identified as a checklist.

(18) A monthly printable plain language Summary of NOTAM in force including a reference to the latest AIP AMDT, checklist of AIP SUP and AIC issued, shall be prepared with a minimum delay and made available by the most expeditious means to the recipients of the Aeronautical Information Product.

(19) The exchange of NOTAM between international NOTAM offices shall, as far as practicable, be limited to the requirements of the receiving States concerned.".