

**SOUTH AFRICAN CIVIL AVIATION AUTHORITY
CIVIL AVIATION ACT, 2009 (ACT NO. 13 OF 2009)**

AMENDMENT SACATS 2/2016

The Director of Civil Aviation has, in terms of section 163(1) of the Civil Aviation Act, 2009 (Act No. 13 of 2009) read with Part 11 of the Civil Aviation Regulations, 2011 amended the following South African Civil Aviation Technical Standards as reflected in the Schedule hereto:

Insertion of SA-CATS 21; Substitution of SA-CTS 43; amendment of SA-CATS 61; substitution of SA-CATS 93; amendment of SA-CATS 121; amendment of SA-CATS 135 and substitution of SA-CATS 140

The Amendment as contained in the Schedule shall come into operation on 28 November 2016.

Poppy Khoza
Director of Civil Aviation
Date:

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 1

Insertion of Technical Standard 21.08.12A

1. The following Technical standard is hereby inserted in after Document SA-CATS 21.08.12:

“21.08.12A: RENEWAL OF CERTIFICATE OF AIRWORTHINESS

- (1) Applicant for the renewal of a certificate of airworthiness shall demonstrate to the Director that:
- (a) the aircraft conforms to an appropriate type acceptance or type certificate; and
 - (b) the aircraft is serviceable and in safe condition for flight at the time an application was submitted to the Director.
- (2) In order to demonstrate the above, the information is submitted by completing the appropriate form (Annual Maintenance Review report prescribed under Document SA-CATS 43) which must be submitted with the prescribed application form:
- (a) that the aircraft is serviceable and in safe condition for flight at the time the application was submitted to the Director;
 - (b) copy of the latest maintenance release certificate as prescribe in Document SA-CATS 43;
 - (c) record of the work accomplished since the last renewal of the certificate of Airworthiness:
 - (i) List of scheduled maintenance checks performed;
 - (ii) List of serialised list of components replaced and/or fitted;
 - (iii) Date of last weighing;
 - (iv) List of Airworthiness Directives performed;
 - (v) List of Manufacturers’ Mandatory instructions for Airworthiness performed;
 - (vi) List of Modifications embodied;
 - (vii) Most recent flight folio page.
 - (viii) List of major repairs and the approvals
 - (ix) Radio station license
- (3) The record of work accomplished may be submitted by:
- (a) recording relevant data on the applicable annual maintenance review report form; or
 - (b) attaching relevant data certified by the appropriately rated AMO, to the applicable annual maintenance review report form; or
 - (c) attaching copies of the appropriate logbook pages to the applicable annual maintenance review report form.”.
- (4) If aircraft is unserviceable at the time of the application for the renewal of the Certificate of Airworthiness, the owner/operator may lodge an application for such renewal together with appropriate fee as prescribed by Part 187. Once the outstanding documentation has been submitted to the Director, within a period of 365 days since the expiry date of the Certificate of Airworthiness, the Certificate of Airworthiness shall

be processed. Furthermore, if the information provided demonstrates that the aircraft is serviceable, the Director shall process the application for the renewal.

- (5) The following information must be furnished for the purpose of completing the appropriate application form for the renewal of certificate of airworthiness:
- (a) aircraft registration;
 - (b) contact details of the Aircraft Maintenance Organization;
 - (c) details of the aircraft owner ;
 - (d) details of the aircraft operator;
 - (e) description of the aircraft;
 - (f) Supporting documents such as:
 - (i) proof of payment;
 - (ii) annual maintenance review report
 - (g) airworthiness certificate category and operational part required;
 - (h) delivery address of certificate of airworthiness; and
 - (i) declaration

SCHEDULE 2

Substitution of Document SA-CATS 43

2. The following technical standard is hereby substituted for Document SA-CATS 43:

SA-CATS 43: GENERAL MAINTENANCE RULES

List of technical standards

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43.01.8 LOSS OF LOGBOOKS

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3. Overhaul of components and installed equipment
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Section B: Maintenance Programme for aeroplanes with an MCM of 5 700kg or less (minimum requirements)

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Section G: Maintenance Programme for airships (minimum requirements)

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43.03.3 RECORDING OF MAJOR REPAIRS AND MODIFICATIONS

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1. Statement

APPENDICES

Appendix 1: Schedule of times between overhaul and life-limited parts for aeroplanes with a mcm of 5 700kg or less or helicopters with a mcm of 3 175kg or less.

Appendix 2: Propeller midlife inspection and repair requirements

43.01.3 LOGBOOKS

1. Format

- (1) The logbook shall make provision for the recording of –
 - (a) airframe, engine and propeller particulars;
 - (b) major defects and damage;
 - (c) compass check swings;
 - (d) Class I product substitution;
 - (e) compliance with airworthiness directives, both recurrent and non-recurrent action;
 - (f) compliance with service bulletins, service letters and similar documents, both recurrent and non-recurrent action;
 - (g) engine components;
 - (h) Class II product overhaul;
 - (i) scheduled inspections;
 - (j) scheduled and non-scheduled maintenance and defect rectification on airframe, engines, propellers and any relevant matter;
 - (k) modification record; and
 - (l) mass & balance.

- (2) The instructions with regard to the opening of the logbook and the recording of entries are as follows:
- (a) All entries must be made in accordance with the current Civil Aviation Regulations.
 - (b) All entries must be legible and made in ink /black ballpoint pen;
 - (c) No pages may be removed from this logbook;
 - (d) No entries shall be obliterated or erased. An erroneous entry shall be identified as such and signed and dated by the person who corrected the error. The use of correction fluids or any method of obliterating an entry is prohibited.
 - (e) Owners and operators are responsible for:
 - (i) the safe keeping of this logbook;
 - (ii) keeping the logbook up to date; and
 - (iii) ensuring that this logbook is made available to persons authorised to examine it and all persons required by the Civil Aviation Regulations, to make the necessary entries after maintenance if and when required to do so.
- (3) All documents which are intended for retention in the logbook must be glued, to the appropriate page to ensure that the record will be retained for the period as prescribed in the Civil Aviation Regulations.
- (4) All current records and information must be transferred from the previous logbook when a new logbook is opened. This information shall be certified as required by the person who transferred the information.
- (5) This logbook may only be utilised for the aircraft to which the serial number, make and designation applies.

43.01.8 LOSS OF LOGBOOKS

1. Procedure for opening new logbooks

- (1) The registered owner shall submit to the Director an affidavit detailing the circumstances leading to the loss of the logbook(s).
- (2) The person or organisation responsible for the opening of a new logbook –
 - (a) may consult relevant records at the premises of the Civil Aviation Authority and at the prescribed fee obtain copies of relevant pages;
 - (b) obtain any further information required to open the substitute logbook(s) so that these comply with the relevant regulations and technical standards, copies of which shall be supplied to the Director;
 - (c) shall provide proof of overhaul of all Class I and all installed Class II products;

- (d) shall research and certify that all relevant Airworthiness Directives, Service Bulletins or Service Letters declared mandatory by the Director have been complied with;
 - (e) shall certify that the aircraft, its engine(s) and in particular its tubular engine mountings (if applicable) have been inspected for corrosion; and
 - (f) shall in the substitute logbook(s) detail and certify the inspection(s) and test(s) carried out to ensure that the aircraft, engine or propeller and their components is indeed serviceable.
- (3) The total hours operated or the times since overhaul of the relevant aircraft, engine(s) or propeller(s) shall be mutually agreed upon between the owner, maintenance organisation(s) and the Director.
- (4) The Director's authorisation shall be inserted into the substitute logbook.

43.02.2 PERSONS TO CARRY OUT MAINTENANCE

1. Pilots

The maintenance that the holder of a pilot licence, other than a student pilot licence, with an appropriate rating issued in terms of Part 61 may carry out is limited to the following items on an aeroplane with a maximum certificated mass of 5 700 kg or less or a maximum approved passenger seating configuration of nine seats or a helicopter with a maximum certificated mass of 3 175 kg or less or a maximum approved passenger seating configuration of nine seats; provided: (a) such holder is the owner or operator of the aircraft; and (b) the aircraft is used for non-commercial operations:

- (1) Emergency /en route maintenance comprising of the following, provided that only approved materials, parts and components are used:
- (a) changing of tyres and tubes and repairing punctures;
 - (b) servicing landing gear shock struts with air;
 - (c) correcting defective locking wire and split pins;
 - (d) replenishing hydraulic fluid in the hydraulic fluid reservoir;
 - (e) small simple repairs to fairings, non-structural cover plates and cowlings by all patches or reinforcements which will not change contours or interfere with proper airflow;
 - (f) replacing side windows where such work does not interfere with the primary system;
 - (g) replacing safety belts;
 - (h) replacing seats or seat parts where such work does not involve any removal, dismantling or interference with a primary structure system;
 - (i) replacing pre-fabricated fuel and oil lines, provided that a fuel flow check is carried out in accordance with TS 43.02.8, Section A.2(6) "fuel flow checks";
 - (j) replacing any electrical bulb, reflector, lens or fuse of navigation and landing lights;
 - (k) replacing or cleaning spark plugs and setting spark plug gaps;
 - (l) cleaning fuel and oil strainers;

- (m) replacing batteries and checking fluid level and specific gravity;
- (n) replacing tail wheels and tail-wheel springs;
- (o) changing engine oil;
- (p) removing and installing such dual controls as is designed for easy removal and installation;
- (q) replacing the following instruments by others of the same type which have such markings as may be indicated in the appropriate owner's manual:
 - (i) airspeed indicator;
 - (ii) altimeter;
 - (iii) engine speed indicator for each engine;
 - (iv) oil pressure gauge for each engine; and
 - (v) fuel contents gauge.

Provided that a pitot static leak check is carried out in accordance with TS 43.02.9 for subparagraphs (q) (i) and (ii) above;

- (2) Whenever it is necessary to carry out maintenance of this nature, the pilot must –
 - (a) notify the aircraft maintenance organisation or aircraft maintenance engineer normally responsible for the maintenance of the aircraft to assist in –
 - (i) supplying parts, if required;
 - (ii) giving technical advice; and
 - (iii) supplying maintenance publications, where required.
 - (b) ensure that any maintenance work done, is correctly recorded in the aircraft flight folio, including particulars of –
 - (i) maintenance publications referred to;
 - (ii) parts replaced (serial numbers where applicable);
 - (iii) parts repaired; and
 - (iv) tests carried out (if applicable).
- (3) Entries in the aircraft flight folio must be accompanied by the pilot's signature, licence number and the date of entry.
- (4) Unless the pilot is the holder of an aircraft maintenance engineer licence with an appropriate rating, such pilots may on no account sign an aircraft logbook in the column intended for the signature of the holder of an aircraft maintenance engineer licence or aircraft maintenance organisation approval.

43.02.3 CARRYING OUT OF MAINTENANCE

1. Maintenance control manual

- (1) The Maintenance Control Manual (MCM) prescribed by CAR 43.02.3(f), which may be issued in separate parts, shall contain the following information:
 - (a) Description of the procedures required to ensure that –

- (i) each aircraft, covered by the MCM, is maintained in an airworthy condition;
- (ii) the operational and emergency equipment, necessary for an intended flight, is serviceable;
- (iii) the Certificate of Airworthiness , as the case may be, and the Certificate of Release to Service remains valid for each aircraft covered by the MCM.
- (b) the administrative arrangements between the operator and the approved maintenance organisation;
- (c) the maintenance procedures and the procedures for completing and signing off maintenance that is based on a system other than that of an approved maintenance organisation;
- (d) names and duties of the person or persons who are required by the MCM to ensure that all maintenance is carried out in accordance with the MCM with regard to an Approved Maintenance Programme. The design and application of the operator's Maintenance Programme shall observe Human Factors principles;
- (e) a description of the methods used for the completion and retention of the maintenance records;
- (f) a description of the procedure for monitoring, assessing and reporting maintenance required by the operator of an aircraft in terms of CAR Subpart 09 of Part 121.
- (g) a description of the procedures for complying with the service information reporting requirements to the aircraft manufacturer and to the Director;
- (h) a description of the procedures for implementing action resulting from mandatory continuing airworthiness information and procedures for assessing continuing airworthiness information, issued by the organisation responsible for the type design of the aircraft covered by the MCM;
- (i) a description of establishing and maintaining a system of analysis and continued monitoring of the performance and efficiency of the Maintenance Programme in order to correct any deficiency in that programme;
- (j) a description of procedures for ensuring that unserviceable items affecting airworthiness are recorded in the flight folio and rectified or deferred in the flight folio in accordance with the MEL;
- (k) a description of procedures for controlling deferred defects, clearing them on return to base, or extending them for a time period acceptable to the Director;
- (l) a description of extending deferred defects over and above the time period acceptable to the Director, and the number of times an extension may be applied for, taking into account the category of severity in each case;
- (m) a description of procedures for controlling recurring defects, the reporting system to be established, and system to effect corrective action;
- (n) a description of procedures for controlling the removal and use of parts from other aircraft, the control and certification of such action and the controlling of TBO records when this occurs;
- (o) a description of the procedure for advising the Director of significant in-service occurrences;

(p) a description of aircraft types and models to which the manual applies.

2. Maintenance programme

- (1) The maintenance programme for each aircraft referred to in paragraph 1(d) above shall contain the following information:
- (a) maintenance tasks and the intervals at which these are to be performed, taking into account the anticipated utilisation of the aircraft;
 - (b) when applicable, a continuing structural integrity programme;
 - (c) procedures for changing, or deviating from, (a) and (b) above; and
 - (d) when applicable, condition monitoring and reliability programme descriptions for aircraft systems and powerplants.

43.02.5 OVERHAUL, REPAIR AND SUBSTITUTION OF MAJOR COMPONENTS

1. Overhauls: General

- (1) Any overhaul must be carried out in accordance with the manufacturer's current overhaul manuals, Airworthiness Directives, mandatory Service Bulletins, mandatory Service Letters and mandatory Service Instructions must be embodied as directed. Refer to technical standard 43.02.8 Section A 3(5)(b).
- (2) Where no manufacturer's instructions or recommendations have been issued, such components or equipment must be overhauled as and when their condition shows that this is necessary to keep the aircraft serviceable. The work involved must be executed in accordance with good aeronautical practices and procedures.
- (3) Overhauls shall be recorded and certified in the appropriate logbook(s) by the holder of an appropriately rated licence or approval.
- (4) The required record of fits and clearances shall be made in the sequence indicated in the respective manuals.
- (5) Imported Class I products may not be fitted to an aircraft unless an export certificate of airworthiness from the State of manufacture, or other data that is acceptable to the Director, is available and subsequently submitted to the Director within 7 days after releasing the aircraft to service.
- (6) No person may certify an extension to any component unless such extension has been approved by the Director in terms of the regulations and unless all recorded history for that component is traceable and amended up to date.
- (6) Tubular engine mountings shall be inspected at the time of the engine overhaul, propeller strikes or whenever an engine is changed for signs of external and internal corrosion, cracks and other damage by magnaflux, dye penetrant or any other NDT inspection procedure acceptable to the Director.
- (7) The record of the overhaul must include a statement that the mountings have been inspected and, if damage is found, the repairs certified.

2. Overhaul of components and installed equipment

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

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 licence or is utilised 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 boroscope inspection carried out on all cylinders. The boroscope inspection must be repeated every two years. The blow-by and boroscope 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.
 - (c) 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.
- (3) The overhaul of turbine engines must be executed in accordance with the manufacturer's current instructions and recommendations not later than the times specified therein. The overhaul of any Class I or II product or item of equipment of such engines and not

specified in Appendix 1 must be carried out as recommended by the relevant manufacturer.

- (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.
- (6) A copy of the overhaul record shall be submitted to the Director by the AMO certifying the installation of the engine in the aircraft within 48 hours of the CRS for an aircraft having been completed and certified by the AMO concerned, or if approved data exists, after flight tested in an aircraft in accordance with the approved data.
- (8) It will be permissible for the holder of an aircraft maintenance organisation approval with the appropriate rating to certify extensions, approved by the Director, to the times between overhauls specified for turbine engines, subject to compliance with the following conditions:
- (a) the person certifying any extension may, on being satisfied from the logbook history trend monitoring records and oil sample analysis of the engine concerned, extend the overhaul time up to the next MPI or other prescribed inspection due. Such extension shall not exceed 10% of the original TBO recommended by the manufacturer;
 - (b) turbine engines that have been granted TBO escalation by the engine manufacturer may not be granted a further extension over and above the TBO escalation;
 - (c) on each occasion that an extension to the TBO of a Class I product is granted, the person certifying such extension must ensure that a conformance test has been carried out and that the performance of the product under test is in accordance with the performance given in the appropriate flight manual. Such person must certify in the appropriate logbook an entry to the following effect:

"I hereby certify that I, in accordance with the provisions of ,(i) have satisfied myself that the maintenance records, performance, condition and record history of (ii) since new or last overhaul is such that it can be operated with safety for a further hours of flight time and I hereby authorize such extension."

Signature:

Licence No.:

Date:

4. Propeller overhauls

Propellers must be overhauled at the times specified in Appendix 1 and 2 irrespective of the Part of the CAR in which the aircraft is operated.

5. Substitution of products, components and parts

- (1) The substitution of products, components and parts with new items, considered to be desirable or essential by the manufacturer of the product, component or part, or recommended after a specified time in service, must be effected at the times recommended by the manufacturer in its applicable manuals, Service Bulletins, Service Letters, Service Instructions or other similar technical information that refer thereto.
- (2) Products, components and parts of which the manufacturer has classified the substitution as essential or mandatory after a specified time in service must be substituted not later than the time prescribed. Where a manufacturer bases the life of an item on factors other than flight times, e.g. number of landings, cycles or calendar periods, such records must be kept in the logbook or other approved recording system in respect of such items to ensure that their expiry dates are not exceeded.
- (2) The substitutions shown in Appendix 1 and 2 are those that the Director considers to be mandatory. Such substitutions must be effected not later than the times prescribed.
- (4) Any substitution must be recorded, together with the item's serial and part number and its historical record, where applicable. Where the part is being substituted with a used part, the time or cycles in service since new or since overhaul must be recorded. No part may be fitted to an aircraft for which traceable records are not available. It shall be the aircraft maintenance organisation's responsibility to ensure that any part received comes from a reliable source and is serviceable, and that the storage limitations have not been exceeded. Substitutions must be certified by the holders of an appropriately rated licence or authorisation.
- (5) In addition to the records prescribed in subsection (4), a separate record of life-limited and TBO items shall be kept in respect of each aircraft to ensure that limitations are not exceeded. This record shall be updated within 48 hours of any item having been overhauled, replaced or substituted.

43.02.6 MAINTENANCE FOR IFR OPERATIONS

1. Inspections

- (1) Whenever an inspection or maintenance is carried out on communication, navigation and surveillance equipment in an aircraft, required for use under IFR, and such requirements are not stipulated by the OEM, the inspection or maintenance shall include the following items:
 - (a) Examine the maintenance records for service history and compliance with the applicable maintenance rules.
 - (b) Inspect and test the bonding of mounting racks and shock mounts for a maximum resistance of 0.05 ohms.
 - (c) Check the VSWR of the transmission lines and aerials of the following:
 - (i) VHF Comm; and
 - (ii) HF Comm (T/R to antenna coupler).

[Note: VSWR less than 1.5:1 is desirable but must not exceed 3:1.]

 - (d) Inspect and test the ADF sense antenna for insulation resistance.

- (e) Ensure antenna coax cable of the proper length.
- (f) Inspect and test the HF antenna for integrity and insulation resistance.
- (g) Inspect and test the operation of ILS receivers with an approved ramp test set, including –
 - (i) testing flag warnings for modulation failure, centre line accuracy, sense and course widths;
 - (ii) testing the audio function; and
 - (iii) carrying out $\pm 1^\circ$ test for freedom of meter movement, sense and course width.
- (h) Inspect and test the operation of VOR with an approved ramp test set, including –
 - (i) testing flag warnings for modulation failure;
 - (ii) omni-radial resolving, and radio magnetic indicators, accuracy at 30° intervals; and
 - (iii) testing the audio function.
- (i) Inspect and test the operation of marker receiver with an approved ramp test set including –
 - (i) testing operations of 400, 1 300 and 3 000 Hz tones and associated lamps; and
 - (ii) where fitted, operation of hi/lo sensitivity.
- (j) Inspect and test the operation of DME with an approved ramp test set, including –
 - (i) testing range accuracy, ground speed reading, if applicable; and
 - (ii) testing the audio function.
- (k) Inspect and test the operation of transponder in accordance with the requirements of this schedule.
- (l) Carry out a full functional check of the ground proximity warning system (GPWS), if applicable.
- (m) Check all other communication, navigation and surveillance equipment installed on the aircraft, not mentioned above, in accordance with the aircraft manufacturer's or equipment manufacturer's requirements or with any other approved data, to ensure that safety standards are not compromised.

43.02.7 MASS AND BALANCE

1. Procedure to establish mass

- (1) Remove excessive dirt, grease and moisture from the aircraft.
- (2) Place the aircraft in a level-flight attitude, as prescribed by the manufacturer.
- (3) Where practical, establish the mass inside a closed building to prevent mass-meter errors introduced by wind.
- (4) Use only approved mass meters as prescribed in sub regulation CAR 43.02.7(4).
- (5) Use mass meters in accordance with their manufacturer's instructions. The mass meters must be positioned at the stations called out by the aircraft's manufacturer. These points shall be clearly indicated in the mass and balance report and be in accordance with the aircraft manufacturer's specifications.

- (6) Obtain the necessary publications (i.e. maintenance manual, flight manual, etc.) before commencing with the procedures.
- (7) Ensure that the aircraft conforms to the definition of its “empty mass” configuration: engine coolant, unusable fuel, total oil, total hydraulic fluid, any fixed ballast, and all items of fixed equipment as per its approved equipment list. Any extra items must be removed before computation.
- (8) Comply with the requirements of Regulation 43.02.3 in respect of the manner in which maintenance must be carried out.

2. Form

- (1) The mass and balance report shall include at least the following information:
 - (a) aircraft nationality and registration letters, make, model and serial number;
 - (b) date on which mass was determined and centre of gravity computed;
 - (c) datum point used;
 - (d) the necessary calculations made;
(A specimen mass and balance report is given in FAA Advisory Circular AC 43.13-1 B.)
 - (e) reference number of applicable publications used;
 - (f) the signature and licence or approval number of the person who was responsible for establishing the mass and the computing of the centre of gravity; and
 - (g) a copy of the mass and balance report must be submitted to the Director and thereafter a CA43-17 certificate shall be issued by the SACAA accordingly.

3. Aircraft documentation

- (1) The person who was responsible for establishing the mass and the computing of the centre of gravity of the aircraft shall make an appropriate entry in the airframe logbook of the aircraft concerned. The date of the entry shall coincide with the date appearing on the mass and balance report.
- (2) The person referred to in subparagraph (1) shall ensure that the approved equipment list is available, certified and up to date, and that the new mass and balance data is entered in the appropriate documentation of the aircraft concerned.
- (2) If an approved equipment list is not available for the aircraft, such a list shall be compiled and submitted to the Director for approval.

43.02.8 MANDATORY INSPECTIONS

CONTENTS

This Technical Standard comprises the following Sections and Parts:

Section A: General

1. General instructions
2. Inspections
3. Associated documents

Section B: Maintenance Programme for Aeroplanes with an MCM of 5 700 kg or less

Section C: Maintenance Programme for Helicopters with an MCM of 3 175 kg or less

Section D: Maintenance Programme for Aeroplanes with an MCM in excess of 5 700 kg

Part 1. Approval and General Instructions

1. Approval
2. Abbreviations
3. Definitions
4. General instructions
5. Scheduled and unscheduled maintenance inspections
6. Overhaul or substitution
7. Mandatory modification and special inspections
8. Certificates of release to service
9. Avionics, Instrumentation and Electrical
10. Amendments
11. Aircraft inspection report
12. Duplicate inspections
13. Rectification of unsatisfactory items
14. Associated documents

Part 2. Scheduled and Unscheduled Inspections

Part 3. Overhauls and Substitution of Class I and Class II Products

Part 4. Airworthiness Directives and Other Service Information

Part 5. Documentation

Part 6. Reliability Programme

Section E: Maintenance Programme for Gliders, including Power-assisted

and Touring Gliders

Section F: Maintenance Programme for Manned Balloons

Section G: Maintenance Programme for Airships

[Under development]

Section H: Aircraft Maintenance Programme for helicopters with an MCM in excess of 3175 kg, and helicopters with an mcm less than 3175 kg that are using manufacturer's inspection programme other than a 100 hrs mpi. (Minimum requirements)

Section I: Maintenance programme for aircraft with an MCM less than 5700 Kg (Minimum requirements)

Appendix 1: Schedule of TBOs and Life-Limited Parts for Small Aeroplanes and Small Helicopters

Appendix 2: Propeller Mid-Life Inspections and Repair Requirements

Annex A: Inspection Reminder

Annex B1: Certificate of Release to Service for Small Aeroplanes, Small Helicopters, Gliders and Manned Balloons

Annex B2: Certificate of Release to Service for Large Aeroplanes and Large Helicopters

Annex C: Certificate Relating to Maintenance

Annex D: Authorised Release Certificate of an Aircraft Part or component

SECTION A: GENERAL

1. General instructions

- (1) Unless the Director has granted an exemption from compliance with any of the requirements contained in its maintenance schedule, no aircraft may be flown unless it is airworthy and all the mandatory maintenance required by its maintenance programme has been carried out when due and has been certified by an appropriately**

rated licence holder, persons authorised in terms of [Part 145](#), or such other person approved by the Director.

- (2) The onus for ensuring that an aircraft is kept airworthy rests on the registered owner or operator of the aircraft. Maintenance programmes are prepared to assist him or her in ensuring that, as far as possible in the light of available information and experience, the aircraft is maintained in an airworthy condition by scheduling the required maintenance through a programme of inspections and overhauls based on the intended operational usage of the aircraft. Such programme may be calendar- or hours-flown or cycles-based.
- (3) The maintenance requirements contained in an aircraft's maintenance programme constitute the minimum requirements considered necessary for the satisfactory maintenance of the aircraft to which the schedule applies. However, in the performing of maintenance on an individual aircraft, due regard must be given to its age, type of operations, climatic and housing conditions and any other factors which may affect the airworthiness of such an aircraft. Consequently, a maintenance programme must not be construed as absolving the owner, the licensed aircraft maintenance engineer or the approved aircraft maintenance organisation from ensuring that any additional maintenance found to be necessary or as required by the Director is carried out.
- (4)(a) Nothing in a maintenance programme is to be construed as relieving the pilot-in-command of an aircraft from his or her responsibility regarding flight preparation as prescribed in CAR 91.02.7.
- (b) It is the duty and responsibility of the pilot-in-command to ensure that unusual occurrences, defects or suspected faults, coming to his or her notice during operations and which affect or may affect the serviceability and safety of the aircraft, are recorded in the aircraft's flight folio as and when they occur and are reported to the appropriate maintenance personnel for investigation or rectification.
- (c) Any defects shall be cleared prior to further flight. When away from base, instructions regarding rectification and certification must be sought and recorded. All rectification away from base must be entered and certified in the aircraft's flight folio and transferred in the appropriate logbook(s) within 48 hours after the aircraft returns to base.
- (5)(a) Maintenance required to be carried out in accordance with the provisions of a maintenance programme must be accomplished under such working conditions and with the use of such tools, equipment, test apparatus and technical information as will ensure completion to standards acceptable to the Director.
- (b) Where the use of special equipment or test apparatus is recommended by the manufacturer of the products involved, such equipment or apparatus, or an acceptable approved equivalent method is to be used. Whenever the tools, equipment or test apparatus referred to in this paragraph are used, it must be ensured that they are in

good working order and condition and that the person using them is familiar with their use.

- (c) Precision measuring tools, equipment, test apparatus and items such as gauges and indicators must be checked annually or as often as deemed necessary by the manufacturer or as required by the Director. Such equipment shall be checked for accuracy and correct calibration.
- (d) Where the security or tightness of nuts, unions and other fasteners is required to be checked, such checking must be done with the aid of the appropriate calibrated tools, where required, and to approved standards.
- (6) When mandatory inspections are to be carried out away from base, the Accountable Manager referred to in [Part 145](#) shall indicate what tools, spares and documentation have to be on hand to satisfactorily carry out the work on the aircraft.
- (7) Prior to the commencement of scheduled maintenance away from base, the AMO or facility shall advise the Director of its intention to carry out the maintenance and supply the following information:
 - (a) Aircraft registration;
 - (b) Name of the organisation to carry out the maintenance, and approvals held;
 - (c) Location where the intended maintenance is to be performed;
 - (d) Type of maintenance to be carried out;
 - (e) Name and licence or approval number(s) of the person(s) responsible for the maintenance;
 - (f) Failure to comply with any applicable mandatory requirement or part of a maintenance programme invalidates the validity of the aircraft's certificate of airworthiness unless exemption has been obtained from the Director in terms of Part 11 of the CAR; and
 - (g) The applicable aircraft logbooks must be available when scheduled maintenance is carried out. Should the aircraft logbooks not be available for perusal and completion, the aircraft may not be released to service.

2. Inspections

(1) Types of inspections

- (a) Inspections as recommended by the manufacturer;
- (b) Mandatory periodic inspections;
- (c) Progressive inspections;
- (d) Block inspections; and
- (e) Other inspections.

(2) Recommended inspections

The inspections referred to in subsection (1)(a) are recommended. However, when the contents of the recommended inspection are evaluated by the Accountable

Manager/owner/operator and indicates that the airworthiness of the aircraft may be affected, they must be incorporated, in respect of aircraft utilised in commercial air transport operations, and in the case of other aircraft whenever so directed by the Director.

(3) Mandatory Inspections

(a) The inspections referred to in subsection (1) (b) or (c) must be accomplished in order to validate or revalidate the Certificate of Airworthiness –

(i) on all aircraft imported into South Africa for the purpose of obtaining a certificate of registration before such aircraft may be put into service;

(ii) on new aircraft built in the Republic;

(iii) when an aircraft has sustained damage, as prescribed in CAR 43.02.5;

(iv) at any time before the next routine inspection is due, should circumstances warrant such action: thus more than once annually or at frequencies less than 100 hours of flight time, should circumstances so dictate.

(4) Mandatory Periodic Inspections (MPI)

(a) A mandatory periodic inspection must be carried out at 100-hours of flight time intervals since the last MPI or within a 12-month period, whichever comes first. (This means that if an aircraft is operated for less than 100 hours of flight time per annum, it will undergo an MPI once within a 12-month period regardless of hours flown).

(b) In carrying out an MPI, the following requirements must be observed:

(i) No MPI may be attempted without the use of an individualised check-list conforming in all essential respects to the manufacturer's requirements, and supplemented by the requirements addressed in Sections B, C, E or F, as applicable. Such check-list may be one compiled by the aircraft manufacturer, provided it is sufficiently comprehensive to cover the complete aircraft and installed equipment. The check-list, used during any inspection, must be retained by the certifying license holder for the appropriate period as prescribed in the regulations;

(ii) all relevant logbooks must be on hand during an MPI;

(iii) before commencing an inspection, the relevant areas must be exposed to assess the condition of the areas under inspection;

- (iv) serviceability of the aircraft must be determined by a thorough inspection in accordance with the manufacturer's recommendations and standard inspection practices and procedures;
- (v) It must be ascertained that the requirements of all mandatory repairs, modifications and special inspections have been met and that the mandatory replacement of components and parts has been carried out;
- (vi) An aircraft inspection report CA43.02 "Aeroplanes", CA43.03 'Helicopters', CA43.04 "Gliders" or CA43.05 'Manned Balloons' shall be submitted by the relevant maintenance organization at intervals not exceeding 12 months, commencing on the date of validation of the C of A. If the aircraft is unserviceable at the time when the applicable form should be completed and submitted, the interval may be extended until the aircraft is again airworthy; or
- (vii) Except when stated so by the OEM, no extension is to be granted in respect of calendar times. Thus: an aircraft operating on an annual limit may not be flown after the 12-month period of validity has lapsed. In such a case a special flight permit is to be requested from the Director to fly the aircraft to a base where the required inspection can be carried out.

(4) Progressive inspections

- (a) An owner or operator may request permission from the Director to introduce a system of progressive inspections to replace the 100-hours mandatory periodic inspection. Such programme of progressive inspections must have been extracted from approved data and ensure that the work required by the mandatory periodic inspection is spread over the approved intervals between successive inspections.

The owner or operator must obtain written approval from the Director for approval to maintain the aircraft on such a particular programme. Full details of the manner in which he or she proposes to implement the programme, together with all relevant data to substantiate the request, must accompany the request.

- (b) Inspections on aircraft that are on an approved progressive inspection programme must be carried out at the intervals prescribed by such programme, provided that, if the programme has not been completed within such time period as prescribed by the manufacturer, the aircraft shall undergo the remainder of its progressive inspection programme before it is being released to service.
- (c) An aircraft inspection report form CA43.02 "Aeroplanes" or CA43.03 "Helicopters" must be completed and forwarded annually on the anniversary of the date on which the programme commenced, together with a copy of the certificate of release to service (Annex B1) to the Director.
- (d) The provisions of paragraph (b) shall apply *mutatis mutandis*.

(3) Block inspections

- (a) Aeroplanes and helicopters may be inspected and maintained in accordance with an approved maintenance programme divided in blocks.
- (b) Where the maintenance programme shows only the items to be inspected at each check, without detailing for what aspect or condition these items are to be inspected, the user of the maintenance programme shall compile check sheets from approved data, which sheets shall indicate in detail the inspection requirements.
- (c) Scheduled and unscheduled maintenance inspections shall be carried out in accordance with the provisions of Section C.

(4) Other inspections

(a) Duplicate inspection

A duplicate inspection of all engine and flight control systems must be carried out after the initial assembly and at any time the systems are disturbed in any way. The purpose of the duplicate inspection is to verify that the manufacturer's specifications and requirements have been met in detail.

An initial inspection of the control system must be made and certified immediately after the maintenance is completed. A duplicate inspection of the controls being worked on must be made by a person referred to in CAR 43.04.1 prior to further flight. See also CAR 43.04.7 "Duplicate Inspection of flight and engine Controls". The following applies for aircraft with an MCM below 5700 kg, and helicopters with an MCM below 3175 kg:

- (i) A duplicate inspection of all engine and flight control systems shall be carried out after initial assembly and at any time the systems have been disturbed in any way. The purpose of the duplicate inspection is to verify that the manufacturer's specifications and requirements have been met in full and that the system meets the requirements.
- (ii) An initial inspection of the control system shall be made and certified by a person in possession of a valid Aircraft Maintenance Engineer's (AME) License, or who has been approved by the Director as an Inspector in an Organization, or who holds company certification as prescribed in Part 145 of the CAR, as amended, immediately after the maintenance is completed and before the aircraft is flown. Persons qualified to perform and certify duplicate inspections are:
 - (aa) A type-rated AME or person holding valid company certification in terms of Part 145 of the CAR, as amended;
 - (bb) An AME, holding a valid license for the particular category, but not type rated;

- (cc) The holder of a valid company certification on a similar type of aircraft falling within the group; and
- (dd) The holder of a valid Airline Transport Pilot License/Commercial Pilot License rated on the type concerned, if the persons referred to in sub-paragraph (aa); (bb) or (cc) are not available.

The AMO should define in its Manual of Procedure the criteria it will follow to ensure that the duplicate inspection is satisfactory conducted.

(b) Non-scheduled maintenance inspections

(i) During operations an aircraft may be subject to –

(aa) hard/overweight landings;

(bb) operations outside the normal flight envelope e.g. - exceeding placarded speed for flaps or landing gear, exceeding aircraft design speeds and loads, etc.;

(cc) severe air turbulence or severe manoeuvres;

(dd) lightning strikes;

(ee) foreign-object damage;

(ff) uncontained engine failures;

(gg) towing involving high drag/side loads due to ground handling; or

(hh) any manoeuvre not catered for in the aeroplane flight manual.

(ii) If any of the foregoing occur, the manufacturer's recommendations must be followed. If no specific procedures are prescribed for a particular aircraft, the Director must be approached for guidance.

(c) Propeller and rotor blade strikes.

(i) Following any propeller strike, whether rotating or as prescribed in the manufacturer's recommendations, a complete propeller and engine disassembly and shock load inspection is mandatory and must be accomplished prior to further flight.

All propeller, engine and applicable exhaust-driven Class II products, such as but not restricted to magnetos, propeller governors, alternators, generators, hydraulic pumps, turbochargers, fuel pumps and vacuum pumps for which there are overhaul instructions available, shall be inspected internally and externally in accordance with the manufacturer's

requirements, and to the extent necessary, to ensure continued safe operation of the propeller, engine and component parts.

The organisation responsible for the above mentioned inspections shall also ensure that the required testing, as prescribed by the manufacturer of the propeller, engine or component involved, is carried out in accordance with such requirements.

- (ii) All procedures and parts as detailed in the relevant engine, propeller and component overhaul/repair manuals, IPCs, ADs, SBs, SLs and SIs shall be adhered to. Reference shall also be made to the relevant AICs.
- (iii) The following shall be substituted when executing a shock-load inspection:
 - (aa) All propeller parts as required in the overhaul/repair manuals;
 - (bb) All engine gaskets, seals, induction and rocker drain hoses, or any other hose that has become brittle, and all locking devices;
 - (cc) All crankshaft bearing or bearing inserts (main and connecting rods), and reduction gear shaft bearing or bearing inserts, where applicable;
 - (dd) All connecting rod bolts and nuts;
 - (ee) All counterweight retention parts (for counterweight-equipped engines);
 - (ff) All piston rings;
 - (gg) All shock absorbing rubbers (magneto and alternator drives); and
 - (hh) All stressed bolts, such as crankshaft gear attaching bolts, camshaft gear attaching bolts, crankshaft alternator drive gear attachment bolts (where applicable), stationary drive gear bolts (reduction gear train), and all other parts that do not meet the manufacturer's service limitation requirements, as well as any incorrect or unapproved parts.
- (iv) All engine mounting rubbers and the engine mounting(s) and attachments shall be x-ray, magnaflux or dye-penetrant inspected and replaced as required.
- (v) In the case of a turbine engine, any additional recommendations by the manufacturer to the foregoing shall be met.

- (d) In the event of a helicopter rotor strike, the manufacturer's recommendations are to be met.

2. Fuel-flow checks.

Fuel flow checks must be carried out and the results recorded in the maintenance records as follows:

- (a) At each MPI on all aircraft with gravity-feed fuel tank systems.
(b) After any maintenance performed on the fuel system, including the replacement of fuel lines, components or tanks.
(c) At any time the operator encounters fuel system starvation problems.

3. Associated documents

- (a) During the maintenance of aircraft due regard must be given to –
- (i) the contents, recommendations or requirements of the relevant manuals, 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 check-list required to be used in terms of section 2(3)(b)(ii)(aa) for each specific aircraft.
- (c) In the event of any conflict between the requirements or instructions issued by a manufacturer and those by the Director, the provisions of the latter shall prevail.
- (d) It is a requirement that all relevant aircraft documents be available, at the time of inspection and that such documents be current and up to date, and that no inspection may be certified unless requirements in respect thereof have been satisfied.
- (e) The registered owner or operator 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 directive (AD) is issued by either 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.

(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 an air service licence or is utilised for the provision for "hire and fly" 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".

(f) Requirements quoted in ADs are periodically revised. Each person carrying out mandatory maintenance shall ensure that such publications are up to date when used, and shall also ensure that any retrospective action required by any publication revision is complied with as and when required.

(g) Modifications and special inspections shall be accomplished not later than the time or date specified against each item. Should the certifying person find that, due to circumstances beyond his or her control, he or she is unable to comply with the manufacturer's instructions regarding the specified time or date, written exemption from compliance must be requested and an acceptable alternate means of compliance must be submitted to the Director for consideration together with all substantiating data. Such approval must be obtained prior to further flight.

(h) Deferred modifications or special inspections shall be accomplished as soon as the circumstances requiring the postponement no longer exist, but in any event not later than the written extension granted by the Director. An alternate method

of compliance may be considered by the Director upon submission of acceptable substantiating data.

- (i) Modifications and special inspections required by the manufacturer of the airframe, engine, propeller, component or installed equipment are made known by way of SBs, SLs, SIs, modification bulletins or other similar technical information. Such information is generally classified by the manufacturer to indicate the degree of essentiality. Licence holders or authorised persons who certify the inspections are to ensure that their organisation possesses and keep up-to-date all such information that is to be brought to the notice of the aircraft owner or operator. No aircraft may be released to service if not all applicable Airworthiness Directives have been complied with as yet.
- (j) 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.
- (k) The accomplishment of any modification or special inspection is to be recorded in the appropriate logbook on the page provided for and to be certified by the licensed or authorised person who performed the maintenance. See also subsection (5)(d) above in respect of any non-compliance.

SECTION B: MAINTENANCE PROGRAMME FOR AEROPLANES WITH AN MCM OF 5 700 KG OR LESS (MINIMUM REQUIREMENTS)

Provided that the Maintenance Programme is drawn up in accordance with this Technical Standard, it serves as the approved aircraft maintenance programme for the particular aeroplane, without the need to forward it to the Director for his or her approval. However, any deviation from the provisions of this Technical Standard shall require the prior approval of the Director.

SAMPLE LAYOUT OF CHECK-LIST, CONTAINING MINIMUM REQUIREMENTS

1.	<u>General:</u>	-	-
-	<u>Aircraft type</u>	<u>Registration Z</u>	<u>S/N</u>
-	<u>Engine type (give full designation)</u>		
-	<u>Engine serial number(s)</u>	<u>No. 1</u>	<u>No. 2</u>
-	<u>Propeller/s type (as applicable)</u>	<u>No. 1</u>	<u>No. 2</u>

MPI MINIMUM CHECK-LIST

[Note: Only the minimum requirements for an MPI are listed. The manufacturer's check sheets must be integrated in the appropriate places for the check-list to be acceptable as an approved aircraft maintenance programme for a particular make and type of aircraft.]

1. Remove or open all necessary inspection panels, access doors, fairings and cowlings and thoroughly clean the aircraft, engine and propeller.
2. Inspect the metal, fiberglass or fabric skin for deterioration, distortion, cracks, corrosion and other evidence of failure and defective or insecure attachments.
Inspect the interior of the fuselage hull, empennage, centre section, wings,
3. control surfaces for deterioration, distortion, cracks, corrosion and other evidence of failure and defective or insecure attachments.
Inspect fabric-covered wings interior cross bracing brackets, bracing rods and
4. the wing rib lacing cords for proper tightness or failure and correct as necessary.
Inspect fuel tanks for condition, leaks and corrosion on the tanks and in the tank bays.
5. Integral tank interiors for sealing and microbiological growth. Sender units for condition.
6. Inspect registration and other markings for conformity.
7. Where applicable, ensure that all water drain holes are open.
8. Inspect area beneath floor including, lines, hoses, wires, control cables and pulleys for condition, cleanliness, security, routing and proper functioning.
Seats for condition and apparent defects, seat rails for condition, wear,
9. locking mechanisms and stops. Safety belts and harnesses for wear, attachment and buckles.
10. Windshields and windows for cleanliness, distortion, crazing, cracks, delimitation, deterioration and breakage.
11. Instruments for poor condition, mounting, marking, placarding, and where practicable: proper operation.
12. Test pitot and static systems with calibrated test equipment for freedom from obstructions and leaks. Drain water traps.
Inspect compass for discolouration and bubbles, check for freedom of rotation
13. and ensure that compass has been swung in accordance with the requirements and periods specified in Technical Standard [43.02.18](#).
Check altimeters and airspeed indicators for accuracy. Carry out a pitot static
14. check with calibrated test equipment. (Note: this check needs to be carried out only once per annum.) See also TS [43.02.9](#).
15. Batteries, terminals and boxes for condition, corrosion, attachment, installation, venting and proper charge.
16. Inspect general condition of all bungee cords for wear, serviceability and correct colour coding. Bungee cords must be replaced on condition or every

five years, whichever occurs first, or in accordance with the manufacturers recommendation.

17. Inspect main and nose or tail landing gear for wear, play, corrosion, rigging, oleos, latches, torque links, rods, doors and locking mechanisms. Operate landing gear through five fault-free cycles or follow the manufacturer's recommendations. Record findings, if applicable.

18. Inspect tyres for wear, cuts and abrasion. Wheels for condition, wear, damage and corrosion. Carry out NDT inspections as required. Brakes for condition, wear, wear pins, pads, drums discs and callipers as required.

19. Flying controls and trim tabs for damage, wear, corrosion, play, freedom of movement and condition. Attachment brackets, operating components, rods and rod ends for damage, wear, play and freedom of movement. Balance weights for security of attachment.

Check aileron travel and aileron trim tab(s) and record:

Right Aileron

Up

down

Left Aileron

Up

down

Trim tab

L.H.

R.H.

Up

down

Check flap travel and record:

20. Up

intermediate

down

(as applicable).

Inspect and record rudder and elevator or stabiliser travels and correct sense:

Rudder left

right

Rudder trim tab: L

R

21.

Elevator up

down

Elevator trim tab: Up

down

(as applicable)

Carry out fuel flow checks:

Left:

Auxiliary Left

22. Right:

Auxiliary Right

All:

Off

23. Check that the propeller has been overhauled within the time limit specified by the manufacturers and that of the provisions of Appendix 1 and 2 have been met.

24. Record cylinder blow-by for each engine(s):

<u>Left</u>	<u>Hand</u>	<u>/80</u>	<u>/80</u>	<u>/80</u>	<u>/80</u>	<u>/80</u>	<u>/80</u>	<u>/80</u>	<u>/80</u>
-	<u>Engine</u>								

Right Hand

- Engine /80 /80 /80 /80 /80 /80 /80 /80

25. Inspect wooden propellers for condition. Check that propeller hub bolts are correctly torqued and bolt holes for excessive compression of the front and rear faces due to over tightening.

26. Inspect installed avionics equipment for proper operation. See Also TS 43.02.6, TS 43.02.10 and TS 43.02.11, as applicable.

27. Carry out a systems check flight and operationally check all systems:

Do you consider the aircraft serviceable: Yes/No

If no, give reason(s):

- Pilot's Name:

- Licence No.:

- Signature:

28. Check that the aircraft meets the requirements of the TCDS.

29. Verify the avionics & communications equipment against the equipment list.

Instructions:

1. All flexible hoses shall be renewed as prescribed by the manufacturer. In cases where the manufacturer does not specify the replacement of hoses, all fluid and pneumatic carrying hoses shall be renewed every eight years. Record part numbers of any hoses renewed in the appropriate logbook(s).

2. Ensure that the aircraft empty mass has been established and revised up to date in accordance with the requirements of Regulations 43.02.7, and that the established mass has been recorded in the flight manual or other approved document on the prescribed form as detailed in Technical Standard 43.02.7.

3. An aircraft may not be released for service unless the following documentation has

been checked for availability, applicability and being up to date:

Certificate of registration No.

Certificate of airworthiness. No.

Currency date:

Radio Station licence:

Expiry date:

Certificate of release to service of an aircraft.

Appropriate flight manual and applicable supplements:

P/No.:

Revision date/number:

Approved mass and balance data and equipment list.

Approved flight folio.

Approved minimum equipment list, if applicable.

Inspection reminder as prescribed in ANNEXURE A.

Record next inspection due hrs. and date.

Airframe, engine(s) and propeller(s) logbooks:

- (a) Record all Airworthiness Directives complied with during this inspection.
- (b) Record all recurring Airworthiness Directives complied with during this inspection.
- 4. (c) Record all Service Bulletins complied with during this inspection.
- (d) Record of Service Letters embodied during this inspection.
- (e) Record of modifications embodied during this inspection.
- (f) Record of other service instructions embodied during this inspection.
- (g) Record of all service instructions, considered mandatory by the manufacturer but, in terms of Section A, subsection 3(5)(c), not embodied at the instruction

of the owner.

I hereby certify that in carrying out the foregoing specified maintenance, all the requirements prescribed in the Civil Aviation Regulations, that are applicable thereto have been complied with.

Date

Signature

LICENCE OR OTHER APPROVAL NO.:

AMO Name

Licence No.

AME Name

Licence No.

SECTION C: MAINTENANCE PROGRAMME FOR HELICOPTERS WITH AN MCM OF 3 175 KG OR LESS (MINIMUM REQUIREMENTS)

Provided that the Maintenance Programme has been drawn up in accordance with this Technical Standard it serves as the approved Aircraft Maintenance Programme for the particular helicopter, without the need to forward it to the Director for his or her approval. However, any deviation from the provisions of this Technical Standard shall require the prior approval of the Director.

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SAMPLE LAYOUT OF CHECK-LIST, CONTAINING MINIMUM REQUIREMENTS

- 1. General:**
- Helicopter type Registration Z S/N
 - Engine type (give full designation)
 - Main Rotor type (as applicable)
 - No. 1 Tail rotor serial number
- 2. Hours or cycles of operation:**
- Airframe Total time Landings If applicable
 -

-

- Before the inspection, remove or open all necessary inspection
1. panels, access doors, fairings and cowlings and thoroughly clean the aircraft, engine, gearbox and rotors.
Inspect the metal, fiberglass or fabric skin for deterioration,
 2. distortion, cracks, corrosion and other evidence of failure and defective or insecure attachments.
Inspect the interior of the fuselage hull, empennage, centre section,
 3. rotor blades for deterioration, distortion, cracks, corrosion and other evidence of failure and defective or insecure attachments.
Inspect fuel tanks for condition, leaks and corrosion on the tanks and
 4. in the tank bays. Integral tank interiors for sealing and microbiological growth. Sender units for condition.
 5. Inspect registration and other markings for conformity.
 6. Where applicable ensure that all water drain holes are open.
Inspect area beneath floor including, lines, hoses, wires, control
 7. cables and pulleys for condition, cleanliness, security, routing and proper functioning.
Seats for condition and apparent defects, seat rails for condition,
 8. wear, locking mechanisms and stops. Safety belts and harnesses for wear, attachment and buckles.
 9. Canopy windshields and windows for cleanliness, distortion, crazing, cracks, delimitation, deterioration and breakage.
 10. Instruments for poor condition, mounting, marking, placarding, where practicable: proper operation.
 11. Test pitot and static systems with calibrated test equipment for freedom from obstructions and leaks. Drain water traps.
Inspect compass for discolouration and bubbles, check for freedom
 12. of rotation and ensure that compass has been swung in accordance with the requirements and periods specified in Technical Standards [43.02.18](#).
Check altimeters and airspeed indicators for accuracy. Carry out a
 13. pitot static check with calibrated test equipment. (Note: this check needs to be carried out only once per annum.) See also Technical

Standard 43.02.9.

14. Batteries, terminals and boxes for condition, corrosion, attachment, installation, venting and proper charge.

Inspect general condition of all drive belts for wear, serviceability.

15. Drive belts must be replaced on condition or in accordance with the manufacturer's recommendation.

16. Main and tail rotor gearboxes, rotorheads, drive trains for condition, corrosion, freedom of movement and balancing as required.

Inspect main, nose landing gear or skids for wear, play, corrosion, rigging, oleos, latches, torque links, rods, doors and locking

17. mechanisms. Operate landing gear through five fault free cycles or follow the manufacturer's recommendations and record findings, if applicable.

Inspect tyres for wear, cuts and abrasion. Wheels for condition, wear, damage and corrosion. Carry out NDT inspections as required.

18. Brakes for condition, wear, wear pins, pads, drums discs and callipers, as required.

Flying controls and trim tabs for damage, wear, corrosion, play, freedom of movement and condition. Attachment brackets, operating components, rods and rod-ends for damage, wear, play and freedom of movement. Balance weights for security of attachment.

20. Carry out fuel flow checks:

Left:

-

Auxiliary Left

Right:

-

Auxiliary Right

All:

-

Off

21. Check that the rotor blades have been overhauled within the time limit specified by the manufacturer.

22. Record cylinder blow-by for each engine(s):

- /80 /80 /80 /80 /80 /80 /80 /80

- /80 /80 /80 /80 /80 /80 /80 /80

23. Check installed avionics equipment for proper operation. See also TS 43.02.6 (when applicable), TS 43.02.10 and TS 43.02.11.

24. Carry out a systems check flight and operationally check all systems:
Do you consider the aircraft serviceable: Yes/No

If no, give reason(s):

-
-
Pilot's Name:

Licence No.:

Signature:

-
-
Instructions:

All flexible hoses shall be renewed as prescribed by the manufacturer. In cases where the manufacturer does not specify the replacement of hoses, all fluid and pneumatic carrying flexible hoses shall be renewed every eight years. Record part numbers of any hoses replaced in the appropriate logbook(s).

Ensure that the helicopter empty mass has been established in accordance with the requirements of Regulation 43.02.7, and that the established mass has been recorded in the flight manual or other approved document on the prescribed form, as detailed in Technical Standard 43.02.7.

A helicopter may not be released for service unless the following documentation has been checked for availability, applicability and being up to date:

3. Certificate of registration No.

Certificate of airworthiness No.

Currency date

Radio Station licence

Expiry date

Certificate of release to service.

Approved flight manual P/No.

Revision date/number

Approved mass and balance data and equipment list.

Approved flight folio.

Approved minimum equipment list, if applicable.

Inspection reminder as prescribed in ANNEX A.

Record next inspection due: hrs. and date.

Airframe and engine(s) logbooks:

Record all Airworthiness Directives complied with during this inspection.

Record all recurring Airworthiness Directives complied with during
4. this inspection.

Record all service bulletins complied with during this inspection.

Record of service letters embodied during this inspection.

Record of modifications embodied during this inspection.

Record of other service instructions embodied during this inspection.

Record of all service instructions, considered mandatory by the manufacturer but, in terms of Section A, subparagraphs 3(5)(c), not embodied at the instruction of the owner.

I hereby certify that in carrying out the foregoing specified maintenance, all the requirements prescribed in the Civil Aviation Regulations, that are applicable thereto have been complied with.

Date

Signature

LICENCE OR OTHER APPROVAL NO.:

AMO Name

Licence No.

AME Name

Licence No.

SECTION D: MAINTENANCE PROGRAMME FOR AEROPLANES WITH AN MCM IN EXCESS OF 5 700 KG (MINIMUM REQUIREMENTS)

APPROVED MAINTENANCE SCHEDULE NO.: J15/9/ /

FOR AIRCRAFT ZS –

SERIAL NO.:

MAKE:

MODEL:

This maintenance programme consists of six parts, namely:

Part 1 – Approval and general instructions

Part 2 – Scheduled and unscheduled maintenance inspections

Part 3 – Overhauls or substitution of Class I and II products

Part 4 – Airworthiness Directives and mandatory modifications

Part 5 – Documents

Part 6 – Reliability programme

PART 1 APPROVAL AND GENERAL INSTRUCTIONS

1. General

This maintenance programme contains the minimum requirements in respect of the maintenance and inspections prescribed aero planes with an MCM in excess of 5 700 kg.

2. Approval

(1) This programme becomes effective on the date approved by the Director and supersedes any previously approved maintenance programme for the aircraft concerned, if any.

(2) Any amendment to this maintenance programme shall require the prior approval of the Director.

(3) This maintenance programme is approved in terms of the powers granted to me by the Act, and shall become effective on the date approved.

Signed: _____ Date: _____

DIRECTOR OF CIVIL AVIATION

1. LIST OF EFFECTED PAGES (LEP)

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REVISION STATUS

-

<u>REVISION NUMBER</u>	<u>INCORPORATED BY</u>	<u>DATE</u>
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C of R–Certificate of Registration

CRS–Certificate of Release to Service

CPCP–Corrosion Prevention Control Programme

CRMA–Certificate Relating to Maintenance of an Aircraft

DDM–Dispatch Deviation Manual

DGAC–Direction Generale de l'Aviation Civile

EASA–European Aviation Safety Agency

FAA–Federal Aviation Administration

FAR–Federal Aviation Regulations

HRS–Hour

IPC–Illustrated Parts Catalogue

JAA–Joint Aviation Authorities

JAR–Joint Aviation Requirements

MTOM–Maximum certificated take-off mass

MCM–Maintenance Control Manual

MEL–Minimum Equipment List

MMEL–Master Minimum Equipment List

MPD–Maintenance Planning Document

MTM–Maximum Certificated Take Off Mass

PI–Progressive Inspection

P/N–Part Number

RVSM–Reduced Vertical Separation Minimum

SACAA–South African Civil Aviation Authority

SB–Service Bulletin

SI–Service Instruction

SL–Service Letter

S/N–Serial Number

SRM–Structural Repair Manual

TBO–Time Between Overhaul

3. Definitions

In this programme, unless inconsistent with the context, the following terms shall have the meanings of descriptions assigned to them (see also Part 1 of the CAR):

“**Airworthy**” means, when used in relation to an aircraft, that the aircraft is serviceable and meets all the requirements prescribed for the issuing of a certificate of airworthiness and such other requirements as have been prescribed for the continuing validity of such a certificate, and when used in relation to the status of an engine, propeller or rotor, or part of an aircraft, it conforms to its approved design and is in a condition for safe operation.

“**Approved Maintenance Programme**” means a document compiled by an owner or operator and approved by the Director that defines the procedures for ensuring the sustained airworthiness of the aircraft to which it relates, its components, installed systems and equipment.

“**Check for condition**” means that the products, component/part or other item referred to must be inspected for cleanliness, corrosion, wear, deterioration, delimitation, cracks, dents, scores, cuts, scratches, distortion, bowing, evidence of overheating, freedom from obstruction, fouling, leaks, correct locking and any other unacceptable feature not specifically mentioned herein. “Inspect for condition” and “Examine for condition” have corresponding meanings.

“**Direct supervision**” means, in relation to the maintenance of an aircraft, that the person exercising the supervision personally maintains such surveillance of all maintenance being performed, as is necessary to ensure that it is being properly carried out, and that this person is readily available in person for consultation with the person doing the work.

“**Large aeroplane**” means an aeroplane with an MCM in excess of 5 700 kg.

“**Maintenance**” means all work carried out in accordance with manufacturers’ recommendations and approved maintenance programme and includes inspection, adjustment, replacement, rectification, repair, modification, overhaul and testing.

“**Progressive inspection**” means the continuous airworthiness inspection of an aircraft at scheduled intervals in accordance with procedures approved by the Director.

“**Serviceable**” means, when used in relation to an aircraft, that the aircraft has been maintained and inspected in accordance with the requirements of the approved maintenance schedule and that all adjustments and rectification's, found to be necessary, have been satisfactorily made.

“Serious defect” means a defect that would result in the aircraft becoming unserviceable, due to damage to its major primary structure, and no longer meeting its type certification basis.

4. General instructions

- (1) The onus for ensuring that an aircraft is kept airworthy rests on the registered owner or operator of the aircraft. This maintenance programme has been prepared to ensure that, as far as possible in the light of information and experience available, the aircraft to which it refers is effectively maintained in an airworthy condition by scheduling the required maintenance during its operational life with a programme of inspections and overhauls, based on normal operational usage of the aircraft.
- (2) The routine maintenance, scheduled inspections, structural integrity inspections, overhaul, modification, major repairs and structural repairs on the aircraft to which this maintenance programme refers shall be undertaken and certified by an appropriately rated approved Aircraft Maintenance Organisation (AMO) only.
- (3) It is the duty and responsibility of the flight crew operating the aircraft to ensure that unusual occurrences, defects or suspected faults, coming to their notice and that may affect the serviceability and safety of the aircraft, are recorded in the flight folio as and when they occur, and are reported to an appropriately approved Aircraft Maintenance Organisation for investigation or rectification. When away from base, instructions regarding their rectification and certification must be sought and recorded.
- (4) All rectification carried out away from base must be entered and certified in the aircraft's flight folio and transferred into the aircraft's logbook/s within 48 hours after the aircraft returns to base.
- (5) A defect, allowable in terms of the MEL, DDM or CDL, must be entered in the flight folio and the aircraft may continue to operate if the defect is not considered to have an adverse effect on the safety of the aircraft. Repetitive entries in the flight folio shall give the reason for the deferment and shall be certified by the holder of valid type certification issued by an approved Aircraft Maintenance Organisation.
- (6) The AMO responsible for the maintenance of the aircraft, to which this programme relates, will draw up a 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;
 - (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 43.02.8 applies.

- (7) The terms “check”, “inspect” and “examine for condition”, where used in this maintenance programme, shall mean that the part, component or item referred to is required to be inspected for cleanliness, corrosion, wear, deterioration, cracks, dents, scores, cuts, scratches, distortion, bowing, evidence of overheating, freedom from obstruction, fouling, leaks, security, correct locking and any other unacceptable feature not specifically mentioned herein, as applicable, and to an extent considered to be commensurate with its known condition at the last inspection and with the known usage or abuse it has undergone since then.
- (8) Any part, component or item, found to be adversely affected, shall be rendered serviceable or substituted by such rectification as is necessary, and no check required by this maintenance programme shall be considered to be complete until all items found unsatisfactory have been effectively rectified.
- (9) Nothing in this maintenance programme shall be construed as:
- (a) absolving the owner or operator or the AMO from ensuring that any additional maintenance found necessary for the continued airworthiness of the aircraft is carried out; or
 - (b) relieving the pilot-in-command of the aircraft from complying with the requirements of this schedule that are applicable to him or her.

5. Scheduled and unscheduled maintenance inspections

- (1) Scheduled and unscheduled maintenance inspections shall be carried out in accordance with the requirements of Part 2 of this maintenance programme.
- (2) Where Part 2 of this maintenance programme shows only the items to be inspected at each check, without detailing what they are to be inspected for, the user of the maintenance programme shall compile check sheets from approved data which shall indicate in detail the inspection requirements.
- (3) Amendments to this maintenance programme must be submitted for approval by the aircraft owner or operator of the aircraft to which the programme refers. Therefore, maintenance organisations are not entitled to request any changes to this maintenance programme unless such request is accompanied by written authority from the owner or operator, as the case may be.
- (4) If the aircraft, to which this maintenance programme relates, sustains a serious defect, its certificate of airworthiness shall automatically become invalid. The certificate will be revalidated once an inspection and repair of the aircraft has been performed to the satisfaction of the Director by a person or body of persons acceptable to him or her, and the Director has satisfied himself or herself that the aircraft can once again be operated safely.

6. Overhaul or substitution

- (1) The aircraft and its components or installed equipment shall be overhauled or substituted in accordance with current instructions prescribed in section 4(6) of [Part 1](#) of this programme and at such times as is prescribed in Part 3.
- (2) If the Director considers it necessary, in the interests of safety, to prescribe a TBO for items for which the manufacturer has not prescribed an overhaul life, such life limitation shall be recorded in Part 3 of this programme.
- (3) If the owner of the aircraft, to which this maintenance programme refers, wishes to extend any TBO specified in Part 3 of this programme, he or she shall apply in writing for the temporary amendment of this programme. Such application must be supported by adequate information substantiating the temporary amendment applied for.
- (4) In addition to the aircraft logbooks or approved recording system, a separate record of life-limited and TBO items shall be kept, to ensure that limitations are not exceeded. This record shall be updated within 48 hours of any component having been overhauled, replaced or substituted.
- (5) The record specified in subsection (4) above, shall include a section to indicate compliance with any recurring ADs, manufacturer's mandatory requirements, such as SBs, SIs and SLs, 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.
- (6) Whenever a record system is introduced, it shall be subject to acceptance by the Director, and no procedural changes that affect the validity of this programme shall be made to the system without the prior approval of the Director.
- (7) Except when stated so by the OEM, no calendar and cycle limitations imposed by the manufacturer may be extended without prior approval of the Director.
- (8) The recording system, to be used to ensure compliance with this programme, shall be as follows:

(Please indicate fully the method of record keeping to be adopted)

7. Mandatory modification and special inspections

- (1) Unless the Director has approved an amendment to this programme, compliance with all modifications or special inspections that the manufacturer of the aircraft, its engines, propellers, instruments and installed equipment considers mandatory by a certain date or time shall be met by that date or time. Failure to comply with the aforementioned requirements will invalidate the C of A. See also section 3(5)(c) and (d) of Section A of Technical Standard 43.02.8.

- (2) Part 4 of this Maintenance programme may contain a list of modifications and special inspections, hereinafter referred to as Airworthiness Directives (ADs) that are issued by the State of Type Design, State of Type Certificate Holder, State of Manufacture or the Director. These may include some of the modifications and inspections referred to in subsection (1) above, or may be additional thereto. Compliance shall be met in accordance with the requirements contained in the applicable AD and not later than the time stated therein. In the event of any conflict between the modifications and special inspections classified as essential and mandatory by the manufacturer or ADs issued by the Director, the provisions of the latter shall prevail.
- (3) Revisions, cancellations or additions to the Part, referred to in subsection (2) above, will be issued as necessary. The requirements shall be complied with not later than the time or date specified. In the event where compliance cannot be met, the requirements of subsection (2) above shall apply with the necessary changes.

8. Certificates of release to service

- (1) A Certificate of Release to Service, as prescribed in Part 5 of this programme and issued in accordance with the requirements of the Civil Aviation Regulations, as amended, shall be valid for the interval between any significant successive checks not to exceed 24 months or on completion of an inspection cycle required by this Maintenance programme not to exceed 24 months.
- (2) When a Certificate of Release to Service becomes invalid due to an aircraft sustaining a defect, its validity will be restored when the defect, that caused it to become invalid, is rectified and such rectification has been certified by a person authorised in terms of CAR 43.04.1, and the Director has satisfied himself or herself that the aircraft can be operated safely.
- (3) When compliance with any Scheduled check is extended in terms of paragraph 2 of Part 2 of this programme, the person(s) extending the check shall issue a new Certificate of Release to Service valid only for the extended period.
- (4) Should the aircraft sustain a serious defect, the Certificate of Release to Service ceases to be valid as such. The Certificate of Airworthiness issued for the aircraft also ceases to be valid.

9. Avionics, instrumentation and electrical

No person shall sign a release to service for avionics, instrument or electrical systems, unless that person has been authorised by, and holds the necessary certification issued by, an approved aircraft maintenance organisation.

10. Amendments

- (1) This maintenance programme specifies the minimum maintenance considered necessary to maintain the aircraft to which it refers in an airworthy condition. No amendment to this maintenance programme may be made without the prior written approval of the Director.
- (2) Subsection (1) is not to be construed as prohibiting any additional maintenance, not specifically mentioned in this programme that may be required to ensure that the aircraft can be operated safely. Such maintenance may be undertaken without the approval of the Director, provided the latter is advised of such requirement and an application for the amendment of this maintenance programme is made accordingly. The Director may wave the amendment requirement.
- (3) Amendments to this Maintenance programme shall become effective on the date of approval by the Director or otherwise as indicated in section 1(5) of [Part 1](#) of this Schedule.
- (4) The user of this Maintenance programme shall, prior to use, ensure that it has been amended to date.

11. Aircraft inspection report

An aircraft inspection report form CA 43.02, as applicable, shall be submitted by the relevant maintenance organization at intervals not exceeding 12 months, commencing on the date of validation of the C of A. If the aircraft is unserviceable at the time when the applicable form should be completed and submitted, the interval may be extended until the aircraft is airworthy again.

12. Duplicate inspections

- (1) A duplicate inspection of all engine and flight control systems shall be carried out after initial assembly and at any time the systems have been disturbed in any way. The purpose of the duplicate inspection is to verify that the manufacturer's specifications and requirements have been met in full.
- (2) An initial inspection of the control system shall be made and certified by a person in possession of a valid Aircraft Maintenance Engineer's (AME) licence, or who has been approved by the Director as an Inspector in an organisation, or holds company certification as prescribed in [Part 145](#) of the CAR, immediately after the maintenance is completed and before the aircraft is flown. Persons qualified to perform and certify duplicate inspections are:

 - (a) A type-rated AME or person holding valid company certification in terms of [Part 145](#) of the Civil Aviation Regulations;
 - (b) An AME, holding a valid licence for the particular category, but not type-rated;

- (c) The holder of valid company certification on a similar type; and
- (d) The holder of a valid airline transport pilot licence rated on the type concerned, if the persons referred to in subparagraphs (a), (b) or (c) are not available.

13. Rectification of unsatisfactory items

- (1) When during any inspection or at any other time any part, product, component or item is found to be unserviceable or, in the opinion of the supervising licensed aircraft maintenance organisation is unlikely to remain serviceable under normal operating conditions during the period preceding the next scheduled inspection, such rectification action as the supervising person considers to be necessary shall be taken to restore or extend the serviceability of the part, component or item prior to returning the aircraft to service.
- (2) All deferred defects shall be transferred from the flight folio and all work involved in restoring the serviceability of any part, component or item shall be clearly recorded in the relevant logbook or other approved recording system and be certified by an appropriately rated person or certificate holder.
- (3) Where aircraft are operating away from base for any length of time, copies of the above mentioned flight folios shall be submitted every seven (7) days to the base in the Republic where the records are normally kept.
- (4) The Certificate of Airworthiness is invalid until the unsatisfactory items have been rectified or the items have been deferred in accordance with the approved MEL, DDM or CDL requirements.

14. Associated documents

- (1) During the maintenance of the aircraft to which this programme applies due regard (sufficient attention) 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 SA-CATS-GMR, 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 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).

[Note: All relevant information and requirements, referred to in subparagraphs (a) and (b) above, must be either contained in, listed, or otherwise associated with the check-list required to be used for the aircraft.]

- (2) In the event of any conflict between the requirements or instructions issued by a manufacturer and those of the Director, the provisions of the latter shall prevail.
- (3) It is a requirement that all relevant aircraft documents be available at the time of inspection and that such documents are current and amended to date. No inspection is to be certified unless all requirements in respect thereof have been satisfied.
- (4) The following is a list of documents which are to be valid, current or amended to date, as the case may be, and shall be checked prior to the aircraft being released to service:
- (a) Certificate of Registration No;
 - (b) Certificate of Airworthiness No;
Expiry date
 - (c) Radio Station Licence No.
Expiry date
 - (d) Certificate of Release to Service;
 - (e) Approved Flight Manual;
 - (f) Mass and Balance and Equipment List data;
 - (g) Flight Folio;
 - (h) MEL;
 - (i) Aircraft logbook/s;
 - (j) Reduced Vertical Separation Minimum (RSVM) certificate (if applicable);
 - (k) Noise certificate (if applicable);
 - (l) Engine emission certificate (if applicable);
 - (m) Fuel venting certificate (if applicable);
 - (n) Approved Maintenance Programme.

PART 2 SCHEDULED AND UNSCHEDULED INSPECTIONS

- (1) The complete periodic inspection cycle of time-limited and maintenance checks shall be as follows:

Check to be done at intervals not exceeding: (Refer to OEM criteria)

(Specify)

- (2) Notwithstanding the requirements contained in subsection (1), it shall be permissible under this programme for an appropriately certificated person nominated by the Accountable Manager of an approved aircraft maintenance organisation, as referred to in Part 145, to extend any scheduled check by not more than ten per cent where the aircraft manufacturer or type certificate holder has approved such an extension: Provided that –
- (a) the person has inspected the aircraft and satisfied himself or herself that the aircraft can be operated safely for the extended period;
 - (b) his or her authority for the extension is entered in the aircraft logbook prior to the aircraft being operated for the extended period;
 - (c) a certificate of release to service has been made out and certified in the correct manner; and
 - (d) the extension shall be deducted from the next scheduled inspection period by an equal amount.
- (3) During the extended period all other scheduled checks and inspections falling due must be carried out within the times specified in subsection (1), but these may also be extended subject to the above requirements having been satisfied.
- (4) The Director may extend any scheduled inspection by a further 2% if the operator has an acceptable reliability programme in place and the operator can prove that safety will not be jeopardised.
- (5) Except when stated so by the OEM, no extension may be granted in respect of calendar and cycle limitations. Thus, when an OEM has not provided for an extension, an aircraft may not be flown without written approval from the Director after a calendar/cycle period of validity has lapsed.
- (6) During operations an aircraft may be subjected to –
- (a) hard or overweight landings;
 - (b) operations outside the normal flight envelope; i.e. aircraft design speed or placarded speed of flaps or landing gear;
 - (c) severe air turbulence or severe manoeuvres;
 - (d) lightning strikes;
 - (e) foreign-object damage;
 - (f) propeller strikes;
 - (g) towing - including high drag or side loads due to ground handling.

If any of the foregoing occurs, the manufacturer's recommendations shall be followed. If no specific procedures are prescribed for the particular type of aircraft, the Director must be consulted, and an alternate method of compliance be submitted for approval.

based on approved data from a person or body of persons responsible for the continued airworthiness of the aircraft.

(7) Fuel flow checks are to be carried out in accordance with the aircraft's maintenance manual and the results recorded:

(a) at any time the fuel system has been worked on; and

(b) at any time the operator encounters fuel system starvation problems.

(8) Installed avionics equipment shall be checked for proper operation. See also TS [43.02.6](#), [TS 43.02.10](#) and [TS 43.02.11](#).

PART 3 OVERHAULS AND SUBSTITUTION OF CLASS I AND II PRODUCTS

(1) Extension intervals as published by the Original Equipment Manufacturer (OEM), may be used, or as listed in Table 1 are extension intervals that the Director allows to be granted to the Time Between Overhauls (TBO) in respect of the aircraft and installed equipment when there are no such intervals published by the manufacturer.

(2) An appropriately certified person nominated by the Accountable Manager of an approved aircraft maintenance organisation may extend any TBO provided that he or she has satisfied himself or herself from the performance, condition and recorded history and approved data for the component concerned that it can be operated safely for the extended period and that his or her authority for the extension is entered, in accordance with subsection (3) below in the appropriate logbook or other appropriate approved record prior to the component concerned is operated for the extended period.

		<u>Table 1</u>
<u>Prescribed TBOs</u>		<u>Maximum extension period permitted, unless the Director approves otherwise</u>
<u>(i)</u>	<u>Up to 3 000 hours</u>	<u>100 hours</u>
<u>(ii)</u>	<u>3 001 to 6 000 hours</u>	<u>200 hours</u>
<u>(iii)</u>	<u>6 001 to 9 000 hours</u>	<u>300 hours</u>
<u>(iv)</u>	<u>9 001 and greater</u>	<u>400 hours</u>

These extension periods may NOT be granted, if the OEM has stipulated an escalation programme approved by the Director. Escalation programmes do not qualify for these extensions.

(3) On each occasion that an extension is granted in terms of subsection (2) above, the person authorising the extension shall certify the following entry in the appropriate logbook:

“I hereby certify that I have satisfied myself, after consulting approved data and historical records of its performance since new or last overhaul, and the condition of (name the product or component concerned giving a description and quoting part and serial number), the latter is such that it can be operated safely for a further hours of flight time. I hereby authorise such extension.

The current total airframe hours are:

Signature

Approval/Licence No.

Date

(4) The current status of life-limited products and parts, whether it be hours, cycles or calendar time must be available.

(5) Except when stated so by the OEM, no calendar and cycle limitations imposed by a manufacturer may be extended without prior approval of the Director. Application with respect to this type of extension must be made in accordance with CAR 43.02.1.

(6) A copy of TBO components must be attached to this Part.

PART 4 AIRWORTHINESS DIRECTIVES AND OTHER SERVICE INFORMATION

(1) Airworthiness Directives (ADs) which concern the aircraft to which this maintenance programme applies (including installed equipment) are dealt with in this Part.

(2) The 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 are reviewed, and those that are classified by the manufacturer 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.

(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 classified as mandatory, in respect of his or her aircraft, this shall be recorded in the appropriate logbook as

“SB (etc.) No. NOT COMPLIED WITH”.

(4) Requirements quoted in ADs are periodically revised. Each user of this programme shall ensure that such publications are up to date when used, and shall also ensure that any retrospective action required by any publication revision is complied with as and when required.

(5) Modifications and special inspections shall be accomplished not later than the time or date specified against each item. Should the certifying person find that, due to circumstances beyond his or her control, he or she is unable to comply with the manufacturer's instructions regarding the specified time or date, written exemption from compliance must be requested and an acceptable alternate means of compliance must be submitted to the Director for consideration together with all substantiating data. Such approval must be obtained prior to further flight.

(6) Deferred modifications or special inspections shall be accomplished as soon as the circumstances requiring the postponement no longer exist, but in any event not later than the written extension granted by the Director. An alternate method of compliance may be considered by the Director upon submission of acceptable substantiating data.

(7) Modifications and special inspections required by the manufacturer of the airframe, engine, propeller, component or installed equipment are made known by way of SBs, SLs, SIs, modification bulletins or other similar technical information. Such information is generally classified by the manufacturer to indicate the degree of essentiality. Licence holders or authorised persons who certify the inspections required by this schedule are to ensure that their organisation possesses and keeps up to-date all such information that is to be brought to the notice of the aircraft owner or operator. No aircraft may be released to service with Airworthiness Directives that has not been complied with as yet.

(8) All modifications and special inspections classified by the manufacturers 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.

(9) The accomplishment of any modification or special inspection is to be recorded on the page provided for in the appropriate logbook and certified by the licensed or authorised person who performed the maintenance.

PART 5 DOCUMENTATION

Insert copy of Certificate of Release to Service for aeroplanes with an MCM in excess of 5 700 kg, as prescribed in Annexure B 2, and amended to reflect the details of the issuing AMO.

PART 6 RELIABILITY PROGRAMME

Attach Reliability Programme or make reference to a separate Reliability Programme document Number.

SECTION E: MAINTENANCE PROGRAMME FOR GLIDERS INCLUDING POWER-ASSISTED AND TOURING GLIDERS (MINIMUM REQUIREMENTS)

Provided the Maintenance Programme has been drawn up in accordance with this Technical Standard it serves as the Approved Aircraft Maintenance Programme for the particular glider without the need to forward it to the Director for his or her approval. However, any deviation from the provisions of this Technical Standard shall require the prior approval of the Director.

-

SAMPLE LAYOUT OF CHECK-LIST, CONTAINING MINIMUM REQUIREMENTS

1. General:

- | | |
|--|---------------------------|
| - <u>Glider type</u> | <u>Registration Z</u> |
| - <u>Manufacturer</u> | <u>S/No.</u> |
| - <u>Date of manufacture</u> | <u>Total Flying Hours</u> |
| - <u>Total Launches</u> | <u>Engine Type *</u> |
| - <u>S/No.</u> | <u>Hrs. Since New/OH</u> |
| - <u>Propeller Type *</u> | <u>S/No.</u> |
| - <u>Hrs. Since New/OH</u> | <u>Registered Owner:</u> |
| - <u>* Delete what is not applicable</u> | - |

2. Hours of engine operation (if applicable):

- | | |
|---|--------------------------|
| - <u>Engine since new or last overhaul and date of last overhaul *</u> | |
| - <u>No. 1</u> | <u>No. 1 Date of O/H</u> |
| - | <u>Hrs</u> |
| - <u>Propeller since new or last overhaul/mid-life inspection and date of</u> | |

last overhaul *

No. 1

No. 1 Date of O/H

Hrs

* Delete what is not applicable

3. Mass and Balance:

Empty Mass

Date last established:

kg

Empty Centre of Gravity

Date last established:

4. Component overhauls due:

(List:)

5. Aircraft documentation:

C of A No.

Currency date:

Available and current

C of R No.

Radio station Licence No.

Currency date:

6. Record of Avionics equipment installed (Name, type and serial nos.):

VHF

ADF

RADAR

HF

DME

GPS

TXPDR

STORMSCOPE

OTHER

[Notes:

- 1. The minimum requirements for the annual inspection are the manufacturer's requirement, integrated with the requirements addressed in the Minimum Check-list.**
- 2. The serviceability of an item is to be indicated by initialling the block against the item, to be countersigned on the job card by the person who inspected the work.**
- 3. A list of the names of all technical and certifying personnel, their signatures and initials shall be attached to the check-list for identification purposes.**
- 4. During any maintenance it will be the responsibility of the aircraft maintenance organisation to verify if Class I and Class II products correspond with the aircraft documentation and determine if the correct data**

are affixed to these products as applicable. If data plates are omitted, the Director must be notified prior to releasing the glider to service, stating what measures have been taken to ensure that the component is not a non-certificated part.]

5. In the case of touring glider, it may be advantageous to combine the maintenance programme for an aeroplane, as listed in Section B of TS 43.02.8, with the maintenance programme for a glider.]

MPI MINIMUM CHECK-LIST

Before the inspection, remove or open all necessary inspection panels, access doors, fairings and cowlings and thoroughly clean the aircraft, engine and propeller (if fitted).

1. Nose fairing – Check to ensure that it is firm and undamaged.
2. Pot pitot/ventilator – The pilot firmly mounted. Connecting tube undamaged. Check operation of ventilator control.
3. Front skid / Shock absorbers / Wheel – Check attachment points of skid or wheel for wear and looseness. Check skid wear plate for wear holes or pieces bent back. Rubber shock absorber blocks not cracked or broken, firmly mounted to both fuselage and skid. Wheel running true without play in bearings. Bearings clean and lubricated. Tyre serviceable.
4. Front fuselage structure – Inspect both inside and outside for cracks or impact-damage, with particular emphasis on fuselage bottom.
5. Release hook assemblies – Clean and not lubricated. Operate the release to establish that the overcentre lock is operating. (An audible “click” is heard as the lock activates.) Ensure that the operating cable is long enough for the release to operate properly. Where a belly hook is fitted, check the back release by applying a spring balance through a set of Tost rings. Pull down at an angle of 83° +/- 7° to the bottom of the hook body. The back release must operate at a load of 16 kg to 24 kg. In the event that the back release has been immobilized, a placard must be placed on the instrument panel, stating **“DO NOT WINCH – AEROTOW ONLY”**. Gliders to be launched by winch MUST have a functional back release.

- Main wheel / brake assembly** – Ensure that the main wheel runs true, bearings are quiet, brakes operate and are properly adjusted.
6. **Check retract linkages for excess play. Ensure that all mounting brackets are firm and that the retract locks down with a positive over-centre.**
- Canopy, locks, jettison** – The canopy must be clear, free of distortion, crazing and cracks, and visibility through it not impaired.
7. **Hold-down locks must operate smoothly. The jettison must be operational and correctly placarded.**
- Harness(es)** – Inspect harness straps for excess wear. Ensure that
8. **attachments points to fuselage are firm. Ensure that all quick-release systems operate smoothly.**
- Seat pan assembly(ies)** – Inspect for damage, cracks or loose
9. **attachment points. Where the seat-pan base is close to the cockpit floor, ensure that pneumatic tubing and electrical wiring are not pinched.**
- Cockpit floor structures** – Inspect for damage or cracks. Ensure
10. **that all bulkheads, supporting release hooks and control systems are still solidly mounted and firm.**
- Rudder pedal assemblies** – Inspect for free movement. Check the
11. **rudder pedal assembly for cracks in the welds or tubes. Ensure that all joints are lubricated. Check that adjustment mechanisms work smoothly. Inspect visible parts of operating cables for wear and strand breakage. Pay particular attention to the cable adjoining the metal swage.**
- Rudder control circuits / stops** – Inspect the stops for excessive
12. **wear or damage. Inspect the visible parts of the control cable for wear and rust. If push-rods are used, check for wear and rust. Ensure that all joints are properly lubricated and function correctly. Ensure that the stop is reached prior to the limit of the control surface deflection. (The latter is the purpose of the stop.)**
13. **Elevator control circuits / stops** – As for item 12.
- Aileron control circuits / stops** – As for item 12. Ensure that on
14. **both sides the aileron going down does not go further than the specified angle. This is important.**

- Trimmer control assemblies** – Inspect all cables for wear. Ensure that the system is properly lubricated and operates smoothly. Where trim is activated by an external tab on a control surface, ensure that the tab hinges are not excessively worn and that all attachment points and linkages are firm. Ensure that there is no excessive play in the trim tab.
- 15.**
- Airbrake control circuit** – Operate airbrakes and ensure: equal deployment on each side; brake-closed locks operate correctly; no excess wear in hinges and linkages, the system is lubricated and operates smoothly; airbrakes do not open too far and go over the centre, thus preventing closure; adjustment of the wheel brake does not restrict airbrake movement (often the airbrake activates the wheel brake).
- 16.**
- Wheel brake controls** – Ensure that wheel brake controls operate smoothly and are adjusted correctly. This is particularly important where wheel brakes operate off the same control circuit s the airbrakes. See also item 16.
- 17.**
- Instrument panel assemblies** – The panel must be firmly mounted and all instruments mounts with the correct number of bolts, etc. Instrument faces must be easy to read, glass unbroken. Tubing and wiring behind the panel must be neat and tidy, not hanging down where it can be damaged when entering the cockpit. Pay special attention to pinched tubes or suspected joints.
- 18.**
- Pitot / static system** – Inspect the tubing for poor joints or wear. Ensure that the system is operational by lightly banging a cupped hand over the pitot or static. Do NOT blow into them.
- 19.**
- ASI calibration** – Ensure that the airspeed indicator is operational and suitable for the glider concerned. It must register low enough for the stall speed, and high enough for the V_{ne} (never-to-exceed speed). See TS 42.02.9 for additional information.
- 20.**
- Altimeter** – Must be of the sensitive type, adjustable to ambient pressure in millibars and calibrated in feet. Additional altimeters (e.g. calibrated in meters) may be carried. See TS 43.02.9 for additional information.
- 21.**
- 22. Electrical installations / fuses** – All electrical systems must

- operate properly and be protected with some sort of fuse system. Inspect wiring for wear and general tidiness.
- Battery / corrosion** – Inspect the battery and connecting wires for condition and corrosion. Ensure that the battery mounting is secure and firm.
- Oxygen system** – Inspect pipes for wear, particular on the high-pressure side of the system. Ensure that the oxygen bottle is free of any visible rust or corrosion, and that it is firmly mounted. No oil must be present in the oxygen installation as it can ignite spontaneously in pure oxygen.
- Avionics installation and placarding** – Check that the transceiver and navigation equipment (if installed) is operational and equipped with the correct frequencies for the area where the glider is to be flown. The aircraft registration must be placarded above the transceiver. See TS [43.02.10](#) if an ATC transponder, and TS [43.02.11](#) if an emergency locator beacon has been installed.
- Water ballast system** – Inspect all plumbing where visible for leaks. Where a tail tank is fitted, it is essential that the tail tank dump mechanism is in perfect working order and that it operates when the main ballast system dumps.
- Removable ballast installation** – Ensure that the ballast retaining mechanism is firm and undamaged. Seat pan ballast should be secured to the seat.
- Speed / mass / manoeuvre placards** – These must be installed in the cockpit and be readable.
- Wing attachments** - Inspect both wing and fuselage attachment points for damage, cracks or excessive wear.
- Control systems in center section** – Inspect for excess wear or play. Ensure there is no rust or corrosion, and that all joints are properly lubricated. Inspect tubing for cracks.
- Equipment stowed in center section** – Ensured that any equipment stowed here is properly tied down and cannot in any way foul the center section control system.
- Center section fairing** – Check for cracks or damage and ensure that all attachment systems operate correctly.

- Mainplane struts / wires** – Check that attachment points are firm and undamaged, struts are not dented, bent or corroded, and that wires are not corroded and the ends not damaged.
- Rear fuselage (internal)** – Look carefully for loose bulkheads, bent longerons, bent control rods, worn cable pulleys, cracks, corrosion or any other damage. A small mirror is useful here.
- Rear fuselage (external)** – Inspect for cracks or impact damage, particular near the tail skid or wheel and in front of the fin.
- Tailplane attachments** – Inspect attachment points for excess wear, cracks or looseness. With tailplane mounted, check for excess play when the tip is moved vertically, as well as fore and aft.
- Fin structure** – Inspect for cracks or damage, particularly where the front of the fin joins the fuselage.
- Rudder assembly and hinges** – Carefully inspect the bottom of the rudder for cracks or damage. Upper and lower hinges – try to move the rudder fore and aft, as well as sideways. Any sign of movement indicates loose or worn hinges. Ensure that the mass balance weights are firm. Ensure that any gap-sealing tapes or mylar tapes are well stuck down.
- Tailplane elevator assembly** – Check that play within linkage system is within limits; mass balance weights firm (usually on all-flying tailplanes); hinges not worn; mylar tapes, particular sealing top of elevator, firm and protected by an additional safety tape ahead of and partially overlapping the mylar tape. The latter is critical on most modern gliders.
- Tail skid / wheel** – Ensure that tail skid is firmly attached to fuselage and wearing surface still useable. Check wheel is running true, tyre is useable and bearings are lubricated and silent.
- Mainplane structure (port)** – Inspect spar ends and area around retaining pin bushes for cracks or damage. Check root rib for cracks near the shear webs, as well as the fuselage-carrying lugs. Ensure the skin show no cracks, with particular emphasis on the leading edges and around the top of the airbrake box. Inspect wingtip skids for cracks and excess wear.
- Aileron / hinge assembly (port)** – Check aileron control circuit for

excess play (permissible play is given in the glider's manual). Check hinge wear by applying a fore and aft load to the aileron in the hinge area. Inspect the aileron for damage, particularly the underside near the tip. If the aileron has been repaired or re-sprayed, it may be necessary to remove it to check the mass balance. This can be critical on gliders that are not fitted with flutter dampers. Ensure each aileron moves the same amount on each side. Ensure any gap-sealing tapes or mylar are well stuck down.

- Airbrake / spoiler assembly** – Inspect linkage for wear and corrosion, Ensure all top cover tension springs and retaining washers are intact. Since most airbrakes are top surface only, and the boxes are sealed, check the inner corners very carefully for signs of water or control-rod rusting.
- 43.**

- Flaps** – Ensure that play in the linkage, etc. is within specified limits. Apply for and aft load to flap in the hinge area and observe any excess movement (hinge wear). Inspect flap for cracks and damage.
- 44.** Place flaps in full negative position and check that sealing tapes are not too tight and restricting movement. The same applies to the aileron tapes.

- 45. Mainplane structure (starboard)** – See item 41.

- 46. Aileron / hinge assembly (starboard)** – See item 42.

- 47. Airbrake / spoiler assembly (starboard)** – See item 43.

- Range of controls** – Ensure that all controls move as much as indicated in the manual. Ensure that sealing tapes do not restrict movement.
- 48.**

- Drag chute(s)** - Check that chutes are not damaged, lines are all undamaged and not tangled. Operate deploy and release mechanisms to ensure correct action.
- 49.**

- Bonding / vents / drains** – Wherever visible, ensure that copper bonding (earth) straps or braided copper wire are correctly attached to control rods and aircraft structure. It is important that all vents and drains are open and functional. E.g., water ballast leakage that finds its way into the tail area and accumulates there could cause very serious C of G problems, and possibly loss of control.
- 50.**

- 51. Lubrication** – All control linkages joints that can be reached and

seen must be clean and lubricated.

- 52. Cleanliness and loose articles** – This item is self-explanatory.
- Mandatory mod's / inspections** – See item 3 'Associated documents' in Section A of Technical Standard 4.02.8 for guidance
- 53. in respect of mandatory inspections and modifications. Check the glider's logbook in respect of their status.**
- 54. Colour coding of controls** – Self-explanatory.
- Logbook entries** – Inspect with the owner the aircraft's logbook and
- 55. ensure that it is up to date.**
- Placarding** – Ensure that all placards are in place as per the
- 56. manual and in accordance with CAR Parts 24 and 96 in respect of a non-type certificated glider.**
- Minimum cockpit load placard** – Repeat from previous inspection,
- 57. unless repairs or re-finishes have been carried out.**
- 58. Maximum cockpit load placard** – See item 57.
- Registration letters** – Ensure that registration letters have been correctly displayed. Under-wing letters to be no smaller than 500 mm high; fuselage, no smaller than 300 mm high. Where this is not
- 59. possible, due to the rear fuselage diameter of the glider, the Director may approve marks of a lesser height, provided they are not less than 150 mm in height and can be easily identified. For full instructions, see SA-CATS 47, TS [47.00.3](#).**
- Wing-beat frequency** – The natural frequency of the wings is established, and the count is taken, when the minimum input is
- 60. required to maintain the beat. It is best done with a soft main wheel and no tail dolly. This test is extremely important, as it could be the first indication of spar or shear web damage.**
- 61. Compass** – Establish that it is operational and not totally inaccurate. See TS [43.02.18](#) for further information.
- Fuel tanks** – If applicable, inspect fuel tank(s) for condition, leaks and corrosion of the tank(s) and in the tank bay(s). Integral tank
- 62. interiors for sealing and microbiological growth. Sender units for condition.**
- 63. Fuel flow check** – If applicable, see paragraph (6) of item 2 'Inspections' in Section A of TS [43.02.8](#).

64. Cylinder blow-by test – If applicable, carry out as per engine manufacturer’s instructions and record on inspection checklist.

Wooden propeller inspection – If fitted, inspect wooden propeller for condition. Check that propeller hub bolts are correctly torqued.

65. Check bolt holes for excessive compression of the front and rear faces due to over tightening. Check that the propeller has been overhauled within the time limit specified by the manufacturer and that the provisions of Appendix 1 and 2 of TS 43.02.8 have been met.

Carry out a systems check flight and operationally check all systems.

Do you consider the aircraft serviceable: Yes/No

If no, state reason(s):

Pilots Name:

Licence No.:

Signature:

INSPECTION CHECK-LIST

To be used when carrying out the inspection of a glider

<u>Item</u>	<u>Description</u>	<u>Status*</u>	<u>Initials</u>	<u>Remarks</u>
<u>1</u>	<u>Nose Fairing</u>	-	-	-
<u>2</u>	<u>Pot Pitot Ventilator</u>	-	-	-
<u>3</u>	<u>Front Skid/Shock Absorbers</u>	-	-	-
<u>4</u>	<u>Front Fuselage Structure</u>	-	-	-
<u>5</u>	<u>Release Hook Assemblies</u>	-	-	-
<u>6</u>	<u>Main Wheel/Brake Assembly</u>	-	-	-
<u>7</u>	<u>Canopy, Locks, Jettison</u>	-	-	-
<u>8</u>	<u>Harness(es)</u>	-	-	-
<u>9</u>	<u>Seat Pan Assembly(ies)</u>	-	-	-
<u>10</u>	<u>Cockpit Floor Structure</u>	-	-	-
<u>11</u>	<u>Rudder Pedal Assemblies</u>	-	-	-

<u>12</u>	<u>Rudder Control Circuit/Stops</u>	-	-	-
<u>13</u>	<u>Elevator Control Circuit/Stops</u>	-	-	-
<u>14</u>	<u>Aileron Control Circuit/Stops</u> <u>Right Aileron:</u> <u>Up</u> <u>Down</u> <u>Left Aileron:</u> <u>Up</u> <u>Down</u>	-	-	-
<u>15</u>	<u>Trimmer Control Assemblies</u> <u>Check aileron trim tab(s) and record:</u> <u>L.H. R.H.</u> <u>Up</u> <u>Up</u> <u>Down</u> <u>Down:</u>	-	-	-
<u>16</u>	<u>Air Brake Control Circuit</u>	-	-	-
<u>17</u>	<u>Wheel Brake Controls</u>	-	-	-
<u>18</u>	<u>Instrument Panel Assemblies</u>	-	-	-
<u>19</u>	<u>Pitot/Static System</u>	-	-	-
<u>20</u>	<u>ASI Calibration</u>	-	-	-
<u>21</u>	<u>Altimeter</u>	-	-	-
<u>22</u>	<u>Electrical Installation/Fuses</u>	-	-	-
<u>23</u>	<u>Battery/Corrosion</u>	-	-	-
<u>24</u>	<u>Oxygen System</u>	-	-	-

<u>25</u>	<u>Radio Installation/Placarding</u>	-	-	-
<u>26</u>	<u>Water Ballast System</u>	-	-	-
<u>27</u>	<u>Removable Ballast Installation</u>	-	-	-
<u>28</u>	<u>Speed/Mass/Manoeuvres Plac's</u>	-	-	-
<u>29</u>	<u>Wing Attachments</u>	-	-	-
<u>30</u>	<u>Control Systems – Centre Section</u>	-	-	-
<u>31</u>	<u>Equipment Stowed – Centre Section</u>	-	-	-
<u>32</u>	<u>Centre Section Fairing</u>	-	-	-
<u>33</u>	<u>Mainplane Struts/Wires</u>	-	-	-
<u>34</u>	<u>Rear Fuselage (internal)</u>	-	-	-
<u>35</u>	<u>Rear Fuselage (external)</u>	-	-	-
<u>36</u>	<u>Tailplane Attachments</u>	-	-	-
<u>37</u>	<u>Fin Structures</u>	-	-	-
<u>38</u>	<u>Rudder Assembly and Hinges</u>	-	-	<u>Rudder</u> <u>Left</u> <u>Right</u> <u>Rudder trim tab:</u> <u>L</u> <u>R</u>
<u>39</u>	<u>Tailplane/Elevator Assembly</u>	-	-	<u>Elevator</u> <u>Up</u> <u>Down</u> <u>Elevator trim tab:</u> <u>Up</u> <u>Down</u>
<u>40</u>	<u>Tail Skid/Wheel</u>	-	-	-

<u>41</u>	<u>Mainplane Structure (port)</u>	-	-	-	
<u>42</u>	<u>Aileron/Hinge (port)</u>	-	-	-	
<u>43</u>	<u>Air Brake/Spoiler Assembly (port)</u>	-	-	-	
<u>44</u>	<u>Flaps (port and starboard)</u>	-	-	-	
<u>45</u>	<u>Mainplane Structure (starboard)</u>	-	-	-	
<u>46</u>	<u>Aileron/Hinge (starboard)</u>	-	-	-	
<u>47</u>	<u>Air Brake/Spoiler Assembly (stbd)</u>	-	-	-	
<u>48</u>	<u>Range of Controls – Checked</u>	-	-	-	
<u>49</u>	<u>Drag Shute(s)</u>	-	-	-	
<u>50</u>	<u>Bonding/Vents/Drains</u>	-	-	-	
<u>51</u>	<u>Lubrication</u>	-	-	-	
<u>52</u>	<u>Cleanliness/Loose Articles</u>	-	-	-	
<u>53</u>	<u>Mandatory Mod's/Inspections</u>	-	-	-	
<u>54</u>	<u>Colour Coding of Controls</u>	-	-	-	
<u>55</u>	<u>Log Book Entries</u>	-	-	-	
<u>56</u>	<u>Placarding</u>	-	-	-	
<u>57</u>	<u>Min. Cockpit Load Placard Kg</u>	-	-	-	
<u>58</u>	<u>Max. Cockpit Load Placard Kg</u>	-	-	-	
<u>59</u>	<u>Registration Letters - Correctness</u>	-	-	-	
<u>60</u>	<u>Wing Bending Freq. (cycles/min)</u>	-	-	-	
<u>61</u>	<u>Compass</u>	-	-	-	
<u>62</u>	<u>Fuel Tank(s)</u>	-	-	-	
<u>63</u>	<u>Fuel Flow Check:</u> -	-	-	-	<u>Left:</u> <u>Right:</u> <u>All:</u> <u>Off:</u>
<u>64</u>	<u>Record cylinder blow-by for the engine</u>	-	-	-	<u>/80</u> <u>/80</u> <u>/80</u> <u>/80</u>
<u>65</u>	<u>Inspect wooden propeller for condition. Check that propeller hub bolts are correctly torqued, and bolt holes for excessive compression of</u>	-	-	-	

<u>the front and rear faces due to over tightening</u>			
--	--	--	--

* N/A = Not Applicable

OK = Serviceable

U/S = Unserviceable

Carry out a systems check flight and operationally check all systems.

Do you consider the aircraft serviceable: Yes/No

If no, state reason(s):

Pilots Name:

Licence No.:

Signature:

Instructions:

- All flexible hoses shall be renewed as prescribed by the manufacturer. In cases where the manufacturer does not specify
1. the replacement of hoses, all fluid and pneumatic carrying flexible hoses shall be renewed every eight years. Record part numbers of any hoses replaced in the appropriate logbook(s). Ensure that the aircraft empty mass has been established and revised up to date in accordance with the requirements of CAR
 2. 43.02.7, and that the established mass has been recorded in the flight manual or other approved document on the prescribed form as detailed in Technical Standard 43.02.7.
- The aircraft may not be released for service unless the following
3. documentation has been checked for availability, applicability and being up to date:
 - Certificate of Registration No.
 - Certificate of Airworthiness No.
 - Currency date:

Radio Station Licence:

-

Expiry date:

-

Certificate of release to service of the aircraft.

-

Approved flight manual:

-

P/No.:

-

Revision date/number:

-

Approved mass and balance data and equipment list.

-

Approved flight folio.

-

Approved minimum equipment list, if applicable.

-

Inspection reminder as prescribed in ANNEXURE A

-

Record next inspection due hrs. and date

4.

Airframe, engine(s) and propeller(s) logbooks:

-

Record all Airworthiness Directives complied with during this inspection.

-

Record all recurring Airworthiness Directives complied with during this inspection.

-

Record all Service Bulletins complied with during this inspection.

-

Record of Service Letters embodied during this inspection.

-

Record of modifications embodied during this inspection.

-

Record of other service instructions embodied during this inspection,

-

Record of all service instructions, considered mandatory by the manufacturer but, in terms of Section A, subparagraphs 3(5)(c), not embodied at the instruction of the owner.

I hereby certify that in carrying out the foregoing specified maintenance, all the requirements prescribed in the Civil Aviation Regulations, that are applicable thereto have been complied with.

Date

Signature

LICENCE OR OTHER APPROVAL NO.:

AMO Name

Licence No.

AME Name

Licence No.

SECTION F: MAINTENANCE PROGRAMME FOR MANNED BALLOONS
(MINIMUM REQUIREMENTS)

Provided that the Maintenance Programme has been drawn up in accordance with this Technical Standard it serves as the Approved Aircraft Maintenance Programme for the particular aircraft without the need to forward it to the Director for his or her approval. However, any deviation from the provisions of this Technical Standard shall require the prior approval of the Director.

-

SAMPLE LAYOUT OF CHECK-LIST, CONTAINING MINIMUM
REQUIREMENTS

- 1. General:**
- | | | |
|---|---------------------------|----------------------------------|
| - | - | - |
| - | <u>Balloon type</u> | <u>Registration Z</u> <u>S/N</u> |
| - | <u>Total Flying Hours</u> | |
| - | <u>Total Ascents</u> | |
- 2. Hours or cycles of operation:**
- | | | |
|---|----------------------------|---------------------|
| - | <u>Envelope total time</u> | <u>Hrs. Ascents</u> |
|---|----------------------------|---------------------|
-

- (a) Check that the temperature link is still in place.
- (b) Check temperature label. If overheating is indicated (above 120°C), install a new label alongside, and note temperature indication in logbook. See paragraph 8 of this appendix for procedures.
- (c) Inspect for holes, tears and abrasions. Holes or tears smaller than 25 mm (1") are acceptable, but all other damage must be repaired using prescribed methods.
- (d) Check fabric porosity by attempting to blow through it. If substantial porosity is suspected, perform a flight test.
- (e) Check envelope fabric strength by a 1" grab test. Minimum strength is 14 kg (30 lbs.). Perform the test three times; the lowest value is disqualifying. Perform test on the top section of the envelope, and make sure original fabric is tested. Also, look for discoloration as sign of overheating or exposure.
- (f) Check both vertical and horizontal tapes for security or stitching. Check especially the stitching of the crown ring, and the joints between overlying tapes and top rim tape.
- (g) Check the flying wire loops for friction and burn damage. Check that the pockets are in place.

1.2 Parachute deflation systems

- (a) Check control lines for wear and burn damage.
- (b) Check that knots are secure.
- (c) Check that pulleys are in good condition and not jammed with loose thread or other foreign material.
- (d) Check stitching of control line tie-off loops and pulley fixings.
- (e) Check that retaining cords and release cords are in good condition. Stiffness indicates overheating.

(f) Check knots and stitching of loops to both parachute and balloon. If there are doubts about the sealing of the parachute, the balloon should be inflated. The parachute overlap should be equal all the way round with no daylight showing and no excessive stress in the retaining lines. Excessive stress is indicated by stress wrinkles in the edge of the parachute.

1.3 Combination tops

(a) Check parachute as above.

(b) Check Velcro control line as above.

(c) Check that capewells operate correctly.

(d) Check fixing of capewells. The fixing of the female half to the Velcro panel is particularly important.

(e) Check condition of Velcro.

(f) Check fit of Velcro. The Velcro panel edge must not be shorter at all, or significantly longer than the Velcro on the balloon. On Velcro balloons, the overlying tapes are gated to a top rim tape. The length of free tape below this rim tape should be 2,5% - 5% shorter than the corresponding seam length on the Velcro panel. Any errors here should be reported to the manufacturer so that the correct repair can be specified.

1.4 Triangular velcro rip

This is only used on certain special shapes. With one person stretching each corner of the triangular aperture, the fitted Velcro panel should be loose below the mesh of overlying tapes. Check rigging and capewell as for parachute/Velcro balloons. Check the condition of the side vent. Check the attachment of release and closing lines as above for parachutes. Check that the elastic closing lines are in good condition.

1.5 Load-bearing attachments

(a) Flying wires must be of stainless steel or kevlar. There should be no exposed stands in the wire and no severe kinks. Slight

discoloration is permissible.

(b) Check thimbles and copper ferrules. Damage to the colour-coded plastic sleeving at the carabiner end of the cable is not important.

(c) Carabiners should be free of distortion with fully operational screw gates. There should be no serious corrosion.

(d) Basket wires: Check for abrasion damage. Check thimbles and copper ferrules.

(e) Burner frame: Check for condition of welds, particularly if the frame shows signs of distortion.

(f) Nylon rods are not critical for flight safety. Replace if cracked.

2. BURNER AND FUEL SYSTEM

2.1 Burner

(a) Check for external signs of damage.

(b) Check tightness of main jets.

(c) Check blast valves for signs of wear or leakage.

(d) Check that all joints and connections are leak proof.

(e) Carry out a burner test, using each cylinder. Observe function of pressure gauge, blast valves and cylinder valves. Cylinders should be vertical for this test.

(f) Pilot light: Check by sound and appearance of flame.

(g) If blockage is suspected, check hoses and jet by removing them and cleaning as necessary. Reassemble with PTFE tape.

(h) Check operation of pilot valves on burner (if fitted).

(i) Hoses: Should be of the wire-braided type. Check for wear, cuts or excessive bends. Liquid hoses should be pinpricked on

the outer cover. Hose inspection should include fuel manifolds, if these are fitted.

2.2 Fuel cylinders

(a) Check for external damage.

(b) Check self-seal on couplings by opening the valves with no hoses connected. No leakage should occur. After closing the liquid valve, release the pressure in the coupling by depressing the central pin.

(c) Check operation of contents gauge.

(d) Fuel tanks should be treated with a mixture of 4 oz. (113,4 gram) methanol/10 gallon (45,46 lt.) propane.

3. BASKETS

(a) Check for wear or excessive distortion in weave.

(b) Check the floor where (and if) the cane passes through it.

(c) Check integrity of wooden floor.

(d) Check rod sockets condition.

(e) Check integrity of tank straps. No more than 30% cross sectional damage is acceptable.

4. INFLATION OR FLIGHT TEST

An inflation test is recommended, as this makes detailed fabric inspection much simpler and allows control lines to be checked. If fabric porosity or leaking parachute is suspected, a carefully monitored test flight should be made to assess fuel consumption.

High fuel consumption itself is not dangerous, but if the leakage is such that exceptional skill is required to fly the balloon, then the balloon is not airworthy.

5. INSTRUMENTS

Check instruments for proper operation, security and that they have been calibrated annually.

6. FIRE EXTINGUISHER

(a) Check by weighing.

(b) Check for condition.

(c) Check mounting brackets and release mechanism.

7. 250-HOUR TEST AND SUBSEQUENT 100-HOUR TEST

Perform grab test in accordance with balloon operating handbook.

8. PROCEDURE AFTER OVERHEATING

If the temperature flag descends (i.e. the fusible link melts) the maximum allowable temperature has been exceeded. The flag will separate at approximately 127°C; maximum allowable temperature is 120°C. Inspect the two temperature indicating tags, if stitched onto the inside surface of the parachute. These tags, in turn, have ten temperature-incremental temperature windows. When a specific temperature is reached, the applicable window will turn black. These tags register service temperature (i.e. direct fabric temperature), which always will be somewhat less than inside air temperature.

If after flag separation the temperature tags show:

(a) Up to 120°C: No further action needed. Replace flag link.

(b) 120°C to 127°C: Carefully inspect top of envelope for signs of overheating, especially parachute and its retaining lines. Look for discoloration and undue stiffness in materials. If any discoloration or stiffness is visible, perform fabric test as per 250-hour inspection. If no signs of overheating are apparent, replace the temperature tags and flag, but always enter into the log/maintenance manual that an overheating has occurred, and what temperatures the tags registered.

(c) 127°C or higher reading: Perform fabric test and enter result of same and temperature reading into flight log.

Do not try to re-solder the temperature flag link - always replace with a new item.

SECTION G: MAINTENANCE PROGRAMME FOR AIRSHIPS (MINIMUM REQUIREMENTS)

Provided that the Maintenance Programme has been drawn up in accordance with this Technical Standard it serves as the Approved Aircraft Maintenance Programme for the particular aircraft without the need to forward it to the Director for his or her approval. However, any deviation from the provisions of this Technical Standard shall require the prior approval of the Director.

SAMPLE LAYOUT OF CHECK-LIST, CONTAINING MINIMUM REQUIREMENTS

- 1. **General:**
 - Airship Type Registration Z S/N
 - Total Flying Hours Total Ascents
- 2. **Hours or cycles of operation:**
 - Envelope total time
 - Ascents
 - Hrs.
- 3. **Mass and balance:**
 - Date last established:
- 4. **Component overhauls due:**
 - (List:)
- 5. **Aircraft documentation:**
 - C of A No. Currency date: Available and current
 - C of R No. Radio station licence Currency date:
 - No.
- 6. **Record of avionics equipment installed (name, type and serial nos.):**
 - VHF ADF RADAR
 - HF DME GPS
 - TXPDR STORMSCOPE OTHER

[Notes:

- 1. **The minimum requirements for the annual inspection are the manufacturer's requirement, integrated with the requirements addressed in the Minimum Check-list.**

2. The serviceability of an item is to be indicated by initialling the block against the item, to be countersigned on the job card by the person who inspected the work.
3. A list of the names of all technical and certifying personnel, their signatures and initials shall be attached to the check-list for identification purposes.
4. During any maintenance it will be the responsibility of the person or organisation carrying out the maintenance to verify whether Class I and Class II products correspond with the aircraft documentation and to determine whether the correct data are affixed to these products, as applicable. If data plates are omitted, the Director must be notified prior to releasing the airship to service, stating what measures have been taken to ensure that the component is not a non-certificated part.]

MPI MINIMUM CHECK-LIST

(Inspect as applicable)

[Under development]

Instructions:

All flexible hoses shall be renewed as prescribed by the manufacturer. In cases where the manufacturer does not specify the

1. replacement of hoses, all fluid and pneumatic carrying flexible hoses shall be renewed every eight years. Record part numbers of any hoses replaced in the appropriate logbook(s).

Ensure that the aircraft empty mass has been established and revised up to date in accordance with the requirements of CAR

2. 43.02.7, and that the established mass has been recorded in the flight manual or other approved document on the prescribed form as detailed in Technical Standard 43.02.7.

The aircraft may not be released for service unless the following

3. documentation has been checked for availability, applicability and being up to date:

- Certificate of registration No.

- Certificate of airworthiness No. .

- Currency date:

- Radio Station licence:

- Expiry date:

- Certificate of release to service of the aircraft.

- Approved flight manual:
- P/No.:
- Revision date/number:
- Approved mass and balance data and equipment list.
- Approved flight folio.
- Approved minimum equipment list, if applicable.
- Inspection reminder as prescribed in ANNEXURE A
- Record next inspection due hrs. and date
- 4. Airframe, engine(s) and propeller(s) logbooks:
- Record all Airworthiness Directives complied with during this inspection.
- Record all recurring Airworthiness Directives complied with during this inspection.
- Record all Service Bulletins complied with during this inspection.
- Record of Service Letters embodied during this inspection.
- Record of modifications embodied during this inspection.
- Record of other service instructions embodied during this inspection.
- Record of all service instructions, considered mandatory by the manufacturer but, in terms of Section A, subsection 3(5)(c), not embodied at the instruction of the owner.

I hereby certify that in carrying out the foregoing specified maintenance,

all the requirements prescribed in the Civil Aviation Regulations, that are applicable thereto have been complied with.

Date

Signature

LICENCE OR OTHER APPROVAL NO.:

AMO Name

Licence No.

AME Name

Licence No.

Section H: AIRCRAFT MAINTENANCE PROGRAMME FOR HELICOPTERS WITH AN MCM IN EXCESS OF 3175 KG, AND HELICOPTERS WITH AN MCM LESS THAN 3 175 KG THAT ARE USING MANUFACTURER'S INSPECTION PROGRAMME OTHER THAN A 100 HRS MPI. (Minimum requirements)

APPROVED MAINTENANCE PROGRAMME NO.: J15/9/ _____ /

THIS AIRCRAFT MAINTENANCE PROGRAMME IS APPLICABLE TO THE FOLLOWING HELICOPTER(S):

<u>Aircraft registration</u>	<u>Aircraft type</u>	<u>Aircraft model</u>	<u>Aircraft Serial number</u>

OPERATOR/OWNER PARTICULARS

Name and address of the owner or operator managing the aircraft's airworthiness to the effect that the specified aircraft will be maintained according to the programme, and the programme will be reviewed and updated as required

<u>Operator /Owner</u>	<u>Address</u>	<u>Telephone number</u>

SOUTH AFRICAN CIVIL AVIATION AUTHORITY APPROVAL

- (1) This programme becomes effective on the date specified by the Director and supersedes any previously approved maintenance Programmes for the aircraft concerned, if any.
- (2) Any amendment to this maintenance programme shall require the prior approval of the Director.
- (3) This maintenance programme is approved in terms of the powers granted to the Director by the Civil Aviation Regulations.

<u>SACAA APPROVAL</u>			
<u>AMP reference number</u>	<u>Initial date of issue</u>	<u>Approval Signature</u>	<u>Initial Approval Date</u>

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- Part 2 - General instruction
- Part 3 – Owner /Operator/AMO certification statement
- Part 4 – Scheduled and unscheduled maintenance inspections
- Part 5 – Permitted variations to maintenance periods
- Part 6– Airworthiness Directives and mandatory modifications
- Part 7 – Documents
- Part 8 - Appendices

DISTRIBUTION LIST

1. Copy No.1 - South African Civil Aviation Authority
2. Copy No. 2 - Owner/operator (state name)
3. Copy No. 3 - AMO (state name)

Note: An Aircraft Maintenance Programme may only be approved for one helicopter type and may not be used for multiple helicopter types.

Note 2: This AMP is not transferable from one owner or operator to another.

PART 1

Maintenance Programme contents and revision status

1. LIST OF AFFECTED PAGES (LEP)

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2. REVISION STATUS

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1.			
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3. ABBREVIATIONS

AD-Airworthiness Directive

AIC–Aeronautical Information Circular

AME–Aircraft Maintenance Engineer

AMO–Aircraft Maintenance Organisation

AMP–Aircraft Maintenance Programme

CAR–Civil Aviation Regulations, as amended

CATS–Civil Aviation Technical Standards

DCA–Director of Civil Aviation

C of A–Certificate of Airworthiness

C of R–Certificate of Registration

CRS–Certificate of Release to Service

CPCP–Corrosion Prevention Control Programme

CRMA–Certificate Relating to Maintenance of an Aircraft

MTOM–Maximum certificated take-off mass

MCM–Maintenance Control Manual

MEL–Minimum Equipment List

MPI–Mandatory Periodic Inspection

MTM–Maximum Certificated Take-off Mass

SACAA–South African Civil Aviation Authority

SB–Service Bulletin

SI–Service Instruction

SL–Service Letter

S/N–Serial Number

SRM–Structural Repair Manual

TBO–Time between Overhaul

4. DEFINITIONS

In this Programme, unless inconsistent with the context, the following terms shall have the meanings of descriptions assigned to them (see also [Part 1](#), subpart 1 of the CAR):

“**Aircraft**” means an aircraft, as defined in the Aviation Act, including its engines, propellers, rotors, components, parts, equipment instruments, accessories and materials.

“**Airworthy**” means, when used in relation to an aircraft, that the aircraft is serviceable and meets all the requirements prescribed for the issuing of a certificate of airworthiness and such other requirements as have been prescribed for the continuing validity of such a certificate.

“**Approved Maintenance Programme**” means a document compiled by an owner or operator, and approved by the Director, that defines the procedures for ensuring the sustained airworthiness of the aircraft to which it relates, its components, installed systems and equipment.

“**Check for condition**” means that the products, component/part or other item referred to must be inspected for cleanliness, corrosion, wear, deterioration, delimitation, cracks, dents, scores, cuts, scratches, distortion, bowing, evidence of overheating, freedom from

obstruction, fouling, leaks, correct locking and any other unacceptable feature not specifically mentioned herein. “Inspect for condition” and “Examine for condition” have corresponding meanings.

“**Direct supervision**” means, in relation to the maintenance of an aircraft, that the person exercising the supervision personally maintains such surveillance of all maintenance being performed, as is necessary to ensure that it is being properly carried out, and that this person is readily available in person for consultation with the person doing the work.

“**Helicopter**” means a heavier-than-air aircraft supported in flight mainly by the reactions of the air on one or more power-driven rotors on substantially vertical axes;

“**Maintenance**” means the performance of tasks required to ensure the continuing airworthiness of an aircraft, including any one or combination of overhaul, inspection, replacement, defect rectification, and the embodiment of a modification or repair;

“**Margin**” is a value used to introduce “flexibility” into maintenance planning in order to compensate for unpredictable situations (e.g. unforeseen increase in the helicopter utilisation rate); “margin” is defines as a value, to be added to a limit value;

“**Progressive inspection**” means the continuous airworthiness inspection of an aircraft at programmed intervals in accordance with procedures approved by the Director;

“**Serviceable**” means, when used in relation to an aircraft, that the aircraft has been maintained and inspected in accordance with the requirements of the Approved Maintenance Programme and that all adjustments and rectifications, found to be necessary, have been satisfactorily made;

“**Serious defect**” means a defect that would result in the aircraft becoming unserviceable, due to damage to its major primary structure, and no longer meeting its type certification basis.

PART 2: GENERAL INSTRUCTIONS

1. GENERAL

This Maintenance Programme contains the minimum requirements in respect of the maintenance and inspections prescribed for helicopters with an MCM of more than 3175 kg or less, utilised in private or commercial air transport operations.

This maintenance programme may apply to several aircraft registrations as long as the maintenance programme clearly identifies the effectivity of the tasks and procedures that are not applicable to all the listed registrations.

This maintenance programme contains a system of inspection requirements. The programme shall be used by operators/owners whose aircraft utilisation is high, low or seasonal and who are using an approved manufacturer’s maintenance programme. This programme encompasses generic Type Certificate holder maintenance requirements and the SACAA instructions for continuing airworthiness.

2. AIRCRAFT USING MANUFACTURER'S INSPECTION PROGRAMME OTHER THAN A 100 HRS MPI.

- (1) In the case of helicopters for which the manufacturer has specified a maintenance programme different from the MPI, the applicable part of the manufacturer's programme shall be inserted into Appendix A, B and C. Maintenance required by the mandatory periodic inspection (refer to Technical standard 43.02.8 [section C] read together with Technical standard 43.02.8 2(3) a & b) which have not been covered by the manufacturer's programme, shall be spread over the approved intervals between successive inspections; this maintenance shall be specified in Appendix C.
- (2) This aircraft maintenance programme establishes compliance with:
 - (a) Instructions issued by the SACAA
 - (b) Instructions for continuing airworthiness issued by: Holders of the type certificate, restricted type certificate, supplemental type certificate, major repair design approval or TSO authorisation.
- (3) Instructions issued by the Authority encompass all types of instructions, from a specific task for a particular aircraft to complete a recommended maintenance programme, to certain types that can be used by the owner/operator directly. These instructions may be used by the authority in the following cases:
 - (a) In the absence of a specific recommendation of the type certificate holder.
 - (b) To provide alternative instructions with the objective of providing flexibility to the operator.
- (4) The onus for ensuring that an aircraft is kept airworthy rests on the registered owner or operator of the aircraft. This maintenance programme has been prepared to ensure that, as far as possible in the light of information and experience available, the aircraft to which it refers is effectively maintained in an airworthy condition by scheduling the required maintenance during its operational life with a programme of inspections and overhauls, based on normal operational usage of the aircraft.
- (5) Routine maintenance, programmed inspections, structural integrity inspections, overhaul, modification, major repairs and structural repairs to the aircraft to which this maintenance programme refers shall be undertaken and certified by an appropriately rated AME(s); holding Part 66 qualifications and /or working under the authorisation of an approved Aircraft Maintenance Organisation (AMO) only.
- (6) It is the duty and responsibility of the flight crew operating the aircraft to ensure that unusual occurrences, defects or suspected faults which come to their notice, and that may affect the serviceability and safety of the aircraft, are recorded in the flight folio or technical log as and when they occur, and are reported to an appropriately approved Aircraft Maintenance Organisation for investigation or rectification. When away from base, instructions regarding their rectification and certification must be sought and recorded.

- (7) All rectification carried out away from base must be entered and certified in the aircraft's flight folio and transferred into the aircraft's logbook/s within 48 hours after the aircraft returns to base.
- (8) A defect which is allowable in terms of the MEL must be entered into the flight folio or technical log, and the aircraft may continue to operate if the defect is not considered to have an adverse effect on the safety of the aircraft. Repetitive entries into the flight folio shall give a reason for deferment and shall be certified by the holder of a valid type certification issued by an approved Aircraft Maintenance Organisation.
- (9) The AMO responsible for the maintenance of the aircraft to which this Programme relates, shall ensure that it complies with the following requirements:
- (a) all information issued by the manufacturers regarding 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 as mandatory by the manufacturer or the Director, and Aeronautical Information Circulars (AICs), issued by the Director and
 - (c) the Civil Aviation Regulations.
- (10) The terms "check", "inspect" and "examine for condition", where used in this maintenance programme, shall mean that the part, component or item referred to is required to be inspected for cleanliness, corrosion, wear, deterioration, cracks, dents, scores, cuts, scratches, distortion, bowing, evidence of overheating, freedom from obstruction, fouling, leaks, security, correct locking and any other unacceptable feature not specifically mentioned herein, as applicable, and to an extent considered to be commensurate with its known condition at the last inspection and with the known usage or abuse it has undergone since then.
- (11) Any part, component or item found to be adversely affected, shall be rendered serviceable or substituted by such rectification as is necessary, and no check required by this maintenance programme shall be considered to be complete until all items found unsatisfactory have been effectively rectified.
- (12) Nothing in this maintenance programme shall be construed as:
- (a) absolving the owner or operator or the AMO from ensuring that any additional maintenance found necessary for the continued airworthiness of the aircraft is carried out; or
 - (b) relieving the pilot-in-command of the aircraft from complying with the requirements of this programme that are applicable to him or her.

- (13) This maintenance programme shall be reviewed annually and amended accordingly when necessary. These reviews will ensure that the programme continues to be valid in the light of the operating experience and instructions from the authority, whilst taking into consideration new and /or modified maintenance instructions promulgated by parties mentioned in Part 2, subsection (2) of this Maintenance programme.

Part 3: OWNER / OPERATOR CERTIFICATION STATEMENT

The undersigned undertakes to ensure that the helicopter will continue to be maintained in accordance with this Approved Maintenance Programme. It is understood that non-compliance with any of the responsibilities and standards may affect flight safety and the safe operation of the helicopter, and will invalidate the Certificate of Airworthiness.

When preparing this programme to meet the requirements of CAR 43, instructions and recommendations made by the airframe, engine and equipment type certificate holders and any supplementary type certificate holders have been evaluated, and where appropriate have been incorporated.

Data contained in the programme will be reviewed annually by the owner/operator or AMO for continued validity.

<u>Maintenance Programme Acceptance</u>			
<u>Signed for and on behalf of the name of the Owner/Operator/AMO</u>	<u>Name of person signing the programme</u>	<u>Signature</u>	<u>Acceptance Date</u>

Part 4: SACAA MAINTENANCE REQUIREMENTS

4.1 General statement

- (1) Scheduled and unscheduled maintenance inspections shall be carried out in accordance with the requirements of Part 4 of this maintenance programme.
- (2) Where APPENDIX C of this maintenance programme shows only the items to be inspected at each check, without detailing what they are to be inspected for, the user of the maintenance programme shall compile check sheets from approved data which shall indicate in detail the inspection requirements.

- (3) Amendments to this maintenance programme must be submitted to SACAA for approval by the aircraft owner or operator of the aircraft to which the programme refers. Therefore, maintenance organisations are not entitled to request any changes to this maintenance programme, unless such request is accompanied by written authority from the owner or operator, as the case may be.
- (4) If the aircraft to which this maintenance programme relates sustains a serious defect, its certificate of airworthiness shall automatically become invalid. The certificate will be revalidated once an inspection and repair of the aircraft has been performed to the satisfaction of the Director by a person or body of persons acceptable to him or her, and the Director has satisfied himself or herself that the aircraft can once again be operated safely.

4.2 Overhaul or substitution

- (1) The aircraft and its components or installed equipment shall be overhauled or substituted in accordance with the current instructions of the OEM.
- (2) If the Director considers it necessary, in the interests of safety, to prescribe a TBO for items for which the manufacturer has not prescribed an overhaul life, such life limitation shall be recorded in APPENDIX B of this programme.
- (3) If the owner of the aircraft to which this maintenance programme refers, wishes to extend any component TBO, he or she shall apply in writing to the Director and request for such an extension. Such application must be supported by adequate information, substantiating the temporary amendment applied for. The application must follow the procedure as prescribed in CAR 43.02.5.
- (4) In addition to the aircraft logbooks or approved recording system, a separate record of life-limited and TBO items shall be kept, to ensure that limitations are not exceeded. This record shall be updated within 48 hours of any component having been overhauled, replaced or substituted.
- (5) The record specified in subsection (4) above, shall include a section to indicate compliance with any recurring ADs, manufacturer's mandatory requirements, such as SBs, SIs and SLs, and applicable structural integrity inspections (SID), such as the corrosion prevention control programme (CPCP).
- (6) Whenever a record system is introduced, it shall be subject to acceptance by the Director, and no procedural changes that affect the validity of this programme shall be made to the system without the prior approval of the Director.
- (7) Except when stated so by the OEM, no calendar, hours and cycle limitations imposed by the manufacturer may be extended without prior approval of the Director.
- (8) The recording system to be used to ensure compliance with this programme shall be as follows:

(Please indicate fully the method of record-keeping to be adopted.)

4.3 Mandatory modification and special inspections

- (1) Unless the Director has approved an amendment to this programme, compliance with all modifications or special inspections that the manufacturer of the aircraft, its engines, propellers, instruments and installed equipment considers mandatory by a certain date or time, shall be met by that date or time. Failure to comply with the aforementioned requirements will invalidate the C of A.
- (2) Appendix B of this maintenance programme may contain a list of modifications and special inspections, hereinafter referred to as Airworthiness Directives (ADs) that are issued by the State of Type Design, State of Type Certificate Holder, State of Manufacture or the Director. These may include some of the modifications and inspections referred to in subsection (1) above, or may be additional thereto. Compliance shall be met in accordance with the requirements contained in the applicable AD and not later than the time stated therein. In the event of any conflict between the modifications and special inspections classified as essential and mandatory by the manufacturer or ADs issued by the Director, the provisions of the latter shall prevail.
- (3) Revisions, cancellations or additions to the Part referred to in subsection (2) above, will be issued as necessary. The requirements shall be complied with not later than the time or date specified. In the event where compliance cannot be met, the requirements of paragraph (2) above shall apply with the necessary changes.

4.4 Certificates of release to service

- (1) A Certificate of Release to Service, as prescribed in Part 8 of this programme and issued in accordance with the requirements of the Civil Aviation Regulations, as amended, shall be valid for the interval between any successive checks or on completion of an inspection cycle required by this maintenance programme.
- (2) When a Certificate of Release to Service becomes invalid due to an aircraft sustaining a defect, its validity will be restored when the defect that caused it to become invalid, is rectified and such rectification has been certified by a person authorised in terms of CAR 43.04.1, and the Director has satisfied himself or herself that the aircraft can be operated safely.
- (3) When compliance with any programmed check is extended in terms of Part 6 of this programme, the person(s) extending the check shall issue a new Certificate of Release to Service, valid only for the extended period.
- (4) Should the aircraft sustain a serious defect, the Certificate of Release to Service ceases to be valid as such. The Certificate of Airworthiness issued for the aircraft also ceases to be valid.

4.4.1 Sequence of releasing an aircraft to service after major scheduled maintenance

1. Aircraft Maintenance completed
2. AMO certification - refer to **Part 8 (A)**
3. System check flight – refer to **Part 8 (B)**
4. Issuance of Certificate of Release to Service –refer to **Part 8 (C)**.

4.5 Persons to carry out maintenance

- (1) The routine maintenance, overhaul, modification and repair of avionics, instrumentation and electrical equipment shall be performed only under the direct supervision of, and be certified by, a person holding an appropriately rated certificate of approval issued by the holder of an approved Aircraft Maintenance Organisation.
- (2) According to CAR 43.02.2(4) the routine maintenance, programmed inspections, structural integrity inspections, overhaul, modification, major repairs and structural repairs on helicopters with a maximum certificated mass of more and less than 3 180 kg shall be undertaken and certified by an appropriately rated approved Aircraft Maintenance Organisation (AMO) only.

Therefore, no person shall sign a release to service for avionics, instrument or electrical systems, unless that person has been authorised by, and holds the necessary certification issued by, an approved aircraft maintenance organisation.

4.6 Amendments

- (1) This maintenance programme specifies the minimum maintenance considered necessary to maintain the aircraft to which it refers in an airworthy condition. No amendment to this maintenance programme may be made without the prior written approval of the Director.
- (2) Subsection (1) is not to be construed as prohibiting any additional maintenance not specifically mentioned in this programme that may be required to ensure that the aircraft can be operated safely. Such maintenance may be undertaken without the approval of the Director, provided the latter is advised of such requirement and an application for the amendment of this maintenance programme is made accordingly. The Director may waive the amendment requirement.
- (3) Amendments to this maintenance programme shall become effective on the date of approval by the Director.
- (4) The user of this maintenance programme shall, prior to use, ensure that it has been amended to date.

4.7 Aircraft inspection report

An aircraft inspection report, form CA 43.03, shall be submitted at intervals not exceeding 12 months, commencing on the date of validation of the C of A. If the aircraft is unserviceable at the time when the applicable form should be completed and submitted, the interval may be extended until the aircraft is airworthy again.

4.8 Duplicate inspections

- (1) A duplicate inspection of all engine and flight control systems must be carried out after the initial assembly and at any time the systems are disturbed in any way. The purpose of the duplicate inspection is to verify that the manufacturer's specifications and requirements have been met in detail.

(2) An initial inspection of the control system must be made and certified immediately after the maintenance is completed. A duplicate inspection of the controls being worked on must be made by a person referred to in CAR 43.04.1 prior to further flight. See also Regulation 43.04.7 “Duplicate Inspection of flight and engine Controls”. The following applies for aircraft with a MCM below 5700 kg, and helicopters with a MCM below 3175 kg:

(a) A duplicate inspection of all engine and flight control systems shall be carried out after initial assembly and at any time the systems have been disturbed in any way. The purpose of the duplicate inspection is to verify that the manufacturer’s specifications and requirements have been met in full and the system meets the requirements.

(b) An initial inspection of the control system shall be made and certified by a person in possession of a valid Aircraft Maintenance Engineer’s (AME) License, or who has been approved by the Director as an Inspector in an Organization, or holds company certification as prescribed in Part 145 of the CAR, as amended, immediately after the maintenance is completed and before the aircraft is flown. Persons qualified to perform and certify duplicate inspections are:

(i) A type-rated AME or person holding valid company certification in terms of Part 145 of the Civil Aviation Regulations.

(ii) An AME, holding a valid license for the particular category, but not type rated.

(iii) The holder of a valid company certification on a similar type of aircraft falling within the group.

(iv) The holder of a valid Airline Transport Pilot License/Commercial Pilot License rated on the type concerned, if the persons referred to in subparagraph (i); (ii) or (iii) are not available. The AMO should define in its Manual of Procedure the criteria it will follow to ensure that the duplicate inspection is satisfactory conducted

4.9 Rectification of unsatisfactory items

(1) When during any inspection or at any other time, any part, product, component or item is found to be unserviceable or, in the opinion of the supervising licensed aircraft maintenance organisation is unlikely to remain serviceable under normal operating conditions during the period preceding the next programmed inspection, such rectification action as the supervising person considers to be necessary, shall be taken to restore or extend the serviceability of the part, component or item prior to returning the aircraft to service.

(2) All deferred defects shall be transferred from the flight folio or technical log and all work involved in restoring the serviceability of any part, component or item shall be clearly recorded in the relevant logbook or any other approved recording system, and be certified by an appropriately rated person or certificate holder.

- (3) Where aircraft are operating away from base for any length of time, copies of the above- mentioned flight folios shall be submitted every seven (7) days to the base in the Republic where the records are normally kept.
- (4) The Certificate of Airworthiness is invalid until the unsatisfactory items have been rectified or the items have been deferred in accordance with the approved MEL requirements.

4.10 Associated documents

- (1) During the maintenance of the 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 SA-CATS 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 Alterations), or their successor publications, Ageing Aircraft Programme, Corrosion Prevention Control Programme, and the Aircraft's Structural Repair Manual (SRM).

[Note: All relevant information and requirements referred to in subparagraphs (a) and (b) above, must be either contained in, listed, or otherwise associated with the check-list required to be used for the aircraft.]
- (2) In the event of any conflict between the requirements or instructions issued by a manufacturer and those of the Director, the provisions of the latter shall prevail.
- (3) It is a requirement that all relevant aircraft documents be available at the time of inspection and that such documents are current and amended to date. No inspection is to be certified unless all requirements in respect thereof have been satisfied.
- (4) The following is a list of documents which are to be valid, current or amended to date, as the case may be, and shall be checked prior to the aircraft being released to service:
 - (a) Certificate of Registration No.
 - (b) Certificate of Airworthiness No.
 - (c) Radio Station Licence No.
 - (d) Certificate of Release to Service
 - (e) Approved Flight Manual
 - (f) Mass and Balance and Equipment List data
 - (g) Flight Folio
 - (h) MEL (if applicable)
 - (i) Aircraft logbook/s

- (j) Noise certificate (if applicable)
- (k) Engine emission certificate (if applicable)
- (l) Fuel-venting certificate (if applicable)
- (m) Approved maintenance programme.

PART 5: SCHEDULED AND UNSCHEDULED INSPECTIONS

(1) The complete periodic inspection cycle of time-limited and maintenance checks shall be as follows:

Check to be done at intervals not exceeding (SPECIFY)

<u>Task</u>	<u>Content</u>	<u>Frequency</u>	<u>Performed by</u> <u>Pilot/AME</u>	<u>Reference</u> <u>Document</u> <u>(updated)</u>
1.				
2.				
3.				
4.				

(2) Except when stated so by the OEM, no extension may be granted in respect of hours or calendar times. Thus, an aircraft may not be flown without written approval from the Director, when a calendar period of validity has lapsed or when the hour limit have been met. Application with respect to this type of extension must be made in accordance with Part 11 of the CAR.

(3) During operations, an aircraft may be subjected to –

- (1) hard or overweight landings;
- (2) operations outside the normal flight envelope; i.e. aircraft design speed or placarded speed of flaps or landing gear;
- (3) severe air turbulence or severe manoeuvres;
- (4) lightning strikes;
- (5) foreign-object damage;
- (6) propeller strikes;
- (7) towing - including high drag or side loads due to ground handling.

If any of the foregoing occurs, the manufacturer’s recommendations shall be followed. If no specific procedures are prescribed for the particular type of aircraft, the Director must be consulted, and an alternate method of compliance be submitted for approval, based on approved data from a person or body of persons responsible for the continued airworthiness of the aircraft.

(4) Fuel flow checks are to be carried out in accordance with the aircraft’s maintenance manual and the results recorded:

- (1) at any time when the fuel system has been worked on; and
- (2) at any time when the operator encounters fuel system starvation problems.
- (5) Installed avionics equipment shall be checked for proper operation. See also TS 43.02.6, TS 43.02.10 and TS 43.02.11.

PART 6: PERMITTED VARIATIONS TO MAINTENANCE PERIODS (if applicable)

- (1) The owner/operator or AMO may only vary the periods prescribed by the programme with the approval of the Director or through a procedure developed in the maintenance programme and approved by the Director.
- (2) Permitted variations may also be called manufacturer's approved margins, allowances or extensions.
- (3) Permitted Variations are applicable only to those items as listed by the manufacturer in the maintenance manual.
- (4) Permitted variations do not apply to Airworthiness Directives, SACAA routine maintenance, and airworthiness life limitations or overhaul and test periods.
- (5) Permitted variation for tasks controlled by flying hours should not be understood as routine, but as an exceptional maintenance planning tool to allow an operator to fly for a limited period of time until the required check is performed.
- (6) Any application of a permitted variation to the maintenance check cycle period must be recorded in the appropriate log book(s) together with the reason for the variation, by a person who is appropriately certificated and was nominated by the Accountable Manager of an approved aircraft maintenance organisation, as referred to in Part 145. The logbook entry shall be made subject to the following:
 - (a) the person has inspected the aircraft and satisfied himself or herself that the aircraft can be operated safely for the extended period;
 - (b) his or her authority for the extension is entered into the aircraft logbook prior to the aircraft being operated for the extended period;
 - (c) a certificate of release to service has been made out and certified in the correct manner; and
 - (d) the number of hours extended is deducted from the next programmed inspection period by an equal amount.
- (7) During the extended period all other programmed checks and inspections falling due must be carried out within the times specified in paragraph 1, but these may also be extended, subject to the above requirements having been satisfied.
- (8) On each occasion that an extension is granted in terms of Part 6 subsection (1), the person authorizing the extension shall certify the following entry in the appropriate logbook:

"I hereby certify that I have satisfied myself, after consulting approved data and historical records of its performance since new or last overhaul, and the condition of (name the product or component concerned giving a description and quoting part and

<u>serial number), the latter is such that it can be operated safely for further hours of flight time. I hereby authorize such an approved manufacturer's margin /allowance or extension".</u>	
<u>The current total airframe hours are:</u>	
<u>Approved margin/allowance/extension permitted for(hours /months)</u>	
<u>Next check minus the permitted margins/allowance /extension</u>	
<u>Reason for the margin/extension/allowance extension</u>	
<u>Signature</u>	
<u>Approval/Licence No.</u>	<u>Date</u>

Note 1: Extensions on manufacturer's approved margins/allowances on this/these aircraft shall also be recorded in APPENDIX B (attachment F) of this programme for trend-analysis purposes.

Note 2: Misuse and failure to record extensions shall warrant rescindment of the privilege.

- (9) The current status of life-limited products and parts whether be it hours, cycles or calendar time must be available.
- (10) Note: No variation or escalation is allowed on components for which an ultimate (scrap) or Retirement life or an Overhaul limit has been prescribed.
- (11) Details of the permitted variation must be made visible /available to the pilot.

PART 7: AIRWORTHINESS DIRECTIVES AND OTHER SERVICE INFORMATION

- (1) Airworthiness Directives (ADs) which relate to the aircraft to which this maintenance programme applies (including installed equipment) are dealt with in this Part.
- (2) The 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 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;
 - (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”.

(4) Requirements quoted in ADs are periodically revised. Each user of this programme shall ensure that such publications are up to date when used, and shall also ensure that any retrospective action required by any publication revision is complied with as and when required.

(5) Modifications and special inspections shall be accomplished not later than the time or date specified against each item. Should the certifying person find that, due to circumstances beyond his or her control, he or she is unable to comply with the manufacturer's instructions regarding the specified time or date, written exemption from compliance must be requested and an acceptable alternate means of compliance must be submitted to the Director for consideration, together with all substantiating data. Such approval must be obtained prior to further flight.

(6) Deferred modifications or special inspections shall be accomplished as soon as the circumstances requiring the postponement no longer exist, but in any event not later than the written extension granted by the Director. An alternate method of compliance may be considered by the Director upon submission of acceptable substantiating data.

(7) Modifications and special inspections required by the manufacturer of the airframe, engine, propeller, component or installed equipment are made known by way of SBs, SLs, SIs, modification bulletins or other similar technical information. Such information is generally classified by the manufacturer to indicate the degree of essentiality. Licence holders or authorised persons who certify the inspections required by this programme are to ensure that their organisation possesses, and keeps up to-date, all such information that is to be brought to the notice of the aircraft owner or operator. No aircraft may be released to service with Airworthiness Directives that have not been complied with.

(8) All modifications and special inspections classified by the manufacturers 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.

(9) The accomplishment of any modification or special inspection is to be recorded on the page provided for in the appropriate logbook and certified by the licensed or authorised person who performed the maintenance.

PART 8: DOCUMENTATION

Part 8 (A)

AMO Certification

I hereby certify that in carrying out the
aforementioned specified maintenance, all the requirements prescribed in the South
African Civil Aviation Regulations 2011, as amended, that are applicable thereto have
been complied with and the aircraft is deemed fit for intended flight. All required
maintenance tasks have been completed.

Date Signature AME

Stamp.....

Part 8 (B)

Carry out a systems check flight and operationally check all systems:

Do you consider the aircraft serviceable: Yes No

If no, give the reason(s) and record findings in Flight Folio

.....

Pilot's Name:

Signature:Pilot's Licence No.....

.....Date.....

Part 8 (C)

Insert copy of Certificate of Release to Service for helicopters with an MCM more or less than 3 175 kg, as prescribed in the SA-CATS 43, Annexure B 1, the CRS shall be amended to reflect the details of the issuing AMO.

PART 9

APPENDIX A

MANUFACTURER'S MAINTENANCE PROGRAMME: SOURCE DATA

The references for source data used in producing the maintenance programme should be listed below in Appendix A; this should include the type certificate holder (airframe/engine/propeller), any modifications including Service Bulletins and STCs ,ADs, SLs ,SI plus data for components.

<u>Title</u>	<u>Chapter</u>	<u>Revision Status</u>
1.		
2.		
3.		

APPENDIX B

DOCUMENTS TO BE ATTACHED TO THIS PART OF THE PROGRAMME:

<u>ATTACHMENTS</u>	<u>DESCRIPTION</u>	<u>Maintenance manual reference</u>
<u>ATTACHMENT - A</u>	<u>Maintenance tasks</u>	
<u>ATTACHMENT - B</u>	<u>Life-limited items and time-limited tasks</u>	
<u>ATTACHMENT - C</u>	<u>Repetitive Inspections</u>	
<u>ATTACHMENT - D</u>	<u>Specific or Additional Operational</u>	
<u>ATTACHMENT - E</u>	<u>Non-aligned tasks (out of phase)</u>	

<u>ATTACHMENT - F</u>	<u>Permitted Variations refer to Part 6 (9) of this AMP</u>	<u>(attach record for trend analysis)</u>
<u>ATTACHMENT - G</u>	<u>Other relevant Inspections or Reliability Programme (if applicable)</u>	

APPENDIX C

SACAA REQUIREMENTS NOT COVERED BY MANUFACTURER:

<u>ITEM NO.</u>	<u>SACAA REQUIREMENTS</u>	<u>FREQUENCY</u>	<u>REGULATION REFERENCE</u>
1.			
2.			
3.			

SECTION I

MAINTENANCE PROGRAMME FOR AEROPLANES WITH AN MCM less than 5 700 KG (MINIMUM REQUIREMENTS)

APPROVED MAINTENANCE PROGRAMME NO.: J15/9/ _____ /

FOR AIRCRAFT: _____ SERIAL NO.:

MAKE: _____ MODEL: _____

This maintenance programme consists of six parts, namely:

Part 1 – Approval and general instructions

Part 2 – Scheduled and unscheduled maintenance inspections

Part 3 – Overhauls or substitution of Class I and II products

Part 4 – Airworthiness Directives and mandatory modifications

Part 5 – Documents

Part 6 – Reliability Programme

Appendix A – Life Components

Appendix B – Scheduled Items

Appendix C – AD's and SB's

PART 1 APPROVAL AND GENERAL INSTRUCTIONS

1. General

This maintenance programme contains the minimum requirements in respect of the maintenance and inspections prescribed aeroplanes with an MCM less than 5 700 kg.

2. Approval

- (1) This programme becomes effective on the date specified by the Director and supersedes any previously approved maintenance programme for the aircraft concerned, if any.
- (2) Any amendment to this maintenance programme shall require the prior approval of the Director.
- (3) This maintenance programme is approved in terms of the powers granted to me by the Act, and shall become effective on the date approved.

Signed: _____ Date: _____

DIRECTOR OF CIVIL AVIATION

LIST OF EFFECTED PAGES (LEP)

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REVISION STATUS

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<u>REVISION NUMBER</u>	<u>INCORPORATED BY</u>	<u>DATE</u>

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2. Abbreviations

AD – Airworthiness Directive

AIC – Aeronautical Information Circular

AME – Aircraft Maintenance Engineer

AMO – Aircraft Maintenance Organisation

<u>AMP</u>	–	<u>Approved Maintenance Programme</u>
<u>BCAR</u>	–	<u>British Civil Aviation Requirements</u>
<u>CAR</u>	–	<u>Civil Aviation Regulations, as amended</u>
<u>CATS</u>	–	<u>Civil Aviation Technical Standards</u>
<u>CD</u>	–	<u>Compact Disc</u>
<u>CDL</u>	–	<u>Configuration Deviation List</u>
<u>DIRECTOR</u>	–	<u>Director Civil Aviation</u>
<u>C of A</u>	–	<u>Certificate of Airworthiness</u>
<u>C of R</u>	–	<u>Certificate of Registration</u>
<u>CRS</u>	–	<u>Certificate of Release to Service</u>
<u>CPCP</u>	–	<u>Corrosion Prevention Control Programme</u>
<u>CRMA</u>	–	<u>Certificate Relating to Maintenance of an Aircraft</u>
<u>DDM</u>	–	<u>Dispatch Deviation Manual</u>
<u>DGAC</u>	–	<u>Direction Generale De L'Aviation Civile</u>
<u>EASA</u>	-	<u>European Aviation Safety Agency</u>
<u>FAA</u>	–	<u>Federal Aviation Administration</u>
<u>FAR</u>	–	<u>Federal Aviation Regulations</u>
<u>HRS</u>	–	<u>Hours</u>
<u>IPC</u>	–	<u>Illustrated Parts Catalogue</u>
<u>JAA</u>	–	<u>Joint Aviation Authorities</u>
<u>JAR</u>	–	<u>Joint Aviation Requirements</u>
<u>MTOM</u>	–	<u>Maximum certificated take-off mass</u>
<u>MCM</u>	–	<u>Maintenance Control Manual</u>
<u>MEL</u>	–	<u>Minimum Equipment List</u>
<u>MMEL</u>	–	<u>Master Minimum Equipment List</u>

<u>MPD</u>	–	<u>Maintenance Planning Document</u>
<u>MTM</u>	–	<u>Maximum Certificated Take Off Mass</u>
<u>PI</u>	–	<u>Progressive Inspection</u>
<u>P/N</u>	–	<u>Part Number</u>
<u>RVSM</u>	–	<u>Reduced Vertical Separation Minimum</u>
<u>SACAA</u>	–	<u>South African Civil Aviation Authority</u>
<u>SB</u>	–	<u>Service Bulletin</u>
<u>SI</u>	–	<u>Service Instruction</u>
<u>SL</u>	–	<u>Service Letter</u>
<u>S/N</u>	–	<u>Serial Number</u>
<u>SRM</u>	–	<u>Structural Repair Manual</u>
<u>TBO</u>	–	<u>Time Between Overhaul</u>

3. Definitions

In this programme, unless inconsistent with the context, the following terms shall have the meanings of descriptions assigned to them (see also Part 1 of the CAR):

“**Aircraft**” means an aircraft as defined in the Civil Aviation Act, 2009 (Act No. 13 of 2009), including its engines, propellers, rotors, components, parts, equipment instruments, accessories and materials.

“**Airworthy**” means, when used in relation to an aircraft, that the aircraft is serviceable and meets all the requirements prescribed for the issuing of a certificate of airworthiness and such other requirements as have been prescribed for the continuing validity of such a certificate.

“**Approved Maintenance Programme**” means a document compiled by an owner or operator and approved by the Director that defines the procedures for ensuring the sustained airworthiness of the aircraft to which it relates, its components, installed systems and equipment.

“**Check for condition**” means that the products, component/part or other item referred to must be inspected for cleanliness, corrosion, wear, deterioration, delimitation, cracks, dents, scores, cuts, scratches, distortion, bowing, evidence of overheating, freedom from obstruction, fouling, leaks, correct locking and any other unacceptable feature not specifically mentioned herein. “Inspect for condition” and “Examine for condition” have corresponding meanings.

“Direct supervision” means, in relation to the maintenance of an aircraft, that the person exercising the supervision personally maintains such surveillance of all maintenance being performed, as is necessary to ensure that it is being properly carried out, and that this person is readily available for consultation with the person doing the work.

“Maintenance” means all work carried out in accordance with manufacturers’ recommendations and approved maintenance programmes and includes inspection, adjustment, substitution, rectification, repair, modification, overhaul and testing.

“Progressive inspection” means the continuous airworthiness inspection of an aircraft at scheduled intervals in accordance with procedures approved by the Director.

“Serviceable” means, when used in relation to an aircraft, that the aircraft has been maintained and inspected in accordance with the requirements of the approved maintenance schedule and that all adjustments and rectification's, found to be necessary, have been satisfactorily made.

“Serious defect” means a defect that would result in the aircraft becoming unserviceable, due to damage to its major primary structure, and no longer meeting its type certification basis.

4. General instructions

- (1) The onus for ensuring that an aircraft is kept airworthy rests on the registered owner/operator of the aircraft. This maintenance programme has been prepared to ensure that, as far as possible in the light of information and experience available, the aircraft to which it refers is effectively maintained in an airworthy condition by scheduling the required maintenance during its operational life with a programme of inspections and overhauls, based on normal operational usage of the aircraft.
- (2) The routine maintenance, scheduled inspections, structural integrity inspections, overhaul, modification, major repairs and structural repairs on the aircraft to which this maintenance programme refers shall be undertaken and certified by an appropriately rated approved Aircraft Maintenance Organisation (AMO) only.
- (3) It is the duty and responsibility of the flight crew operating the aircraft to ensure that unusual occurrences, defects or suspected faults, coming to their notice and that may affect the serviceability and safety of the aircraft, are recorded in the flight folio as and when they occur, and are reported to an appropriately approved Aircraft Maintenance Organisation for investigation or rectification. When away from base, instructions regarding their rectification and certification must be sought and recorded.
- (4) All rectification carried out away from base must be entered and certified in the aircraft’s flight folio and transferred into the aircraft’s logbook/s within 48 hours after the aircraft returns to base.
- (5) A defect, allowable in terms of the MEL, DDM or CDL, must be entered in the flight folio and the aircraft may continue to operate if the defect is not considered to have an

adverse effect on the safety of the aircraft. Repetitive entries in the flight folio shall give the reason for the deferment and shall be certified by the holder of valid type certification issued by an approved Aircraft Maintenance Organisation.

(6) The 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;

(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.

(7) The terms “check”, “inspect” and “examine for condition”, where used in this maintenance programme, shall mean that the part, component or item referred to is required to be inspected for cleanliness, corrosion, wear, deterioration, cracks, dents, scores, cuts, scratches, distortion, bowing, evidence of overheating, freedom from obstruction, fouling, leaks, security, correct locking and any other unacceptable feature not specifically mentioned herein, as applicable, and to an extent considered to be commensurate with its known condition at the last inspection and with the known usage or abuse it has undergone since then.

(8) Any part, component or item, found to be adversely affected, shall be rendered serviceable or substituted by such rectification as is necessary, and no check required by this maintenance programme shall be considered to be complete until all items found unsatisfactory have been effectively rectified.

(9) Nothing in this maintenance programme shall be construed as:

(a) absolving the owner or operator from ensuring that any additional maintenance found necessary for the continued airworthiness of the aircraft is carried out; or

(b) relieving the pilot-in-command of the aircraft from complying with the requirements of this schedule that are applicable to him or her.

5. Scheduled and unscheduled maintenance inspections

(1) Scheduled and unscheduled maintenance inspections shall be carried out in accordance with the requirements of Part 2 of this maintenance programme.

- (2) Where Part 2 of this maintenance programme shows only the items to be inspected at each check, without detailing what they are to be inspected for, the user of the maintenance programme shall compile check sheets from approved data which shall indicate in detail the inspection requirements.
- (3) Amendments to this maintenance programme must be submitted for approval by the aircraft owner or operator of the aircraft to which the programme refers. Therefore, maintenance organisations are not entitled to request any changes to this maintenance programme unless such request is accompanied by written authority from the owner or operator, as the case may be.

6. Overhaul or substitution

- (1) The aircraft and its components or installed equipment shall be overhauled or substituted in accordance with current instructions prescribed in section 4(6) of Part 1 of this programme and at such times as is prescribed in Part 3.
- (2) If the Director considers it necessary, in the interests of safety, to prescribe a TBO for items for which the manufacturer has not prescribed an overhaul life, such life limitation shall be recorded in Part 3 of this programme.
- (3) If the owner of the aircraft, to which this maintenance programme refers, wishes to extend any TBO specified in Part 3 of this programme, he or she shall apply in writing for the temporary amendment of this programme. Such application must be supported by adequate information substantiating the temporary amendment applied for. The application must follow the procedure as prescribed in CAR 43.02.1.
- (4) In addition to the aircraft logbooks or approved recording system, a separate record of life-limited and TBO items shall be kept, to ensure that limitations are not exceeded. This record shall be updated within 48 hours of any component having been overhauled, replaced or substituted.
- (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.
- (6) Whenever a record system is introduced, it shall be subject to acceptance by the Director, and no procedural changes that affect the validity of this programme shall be made to the system without the prior approval of the Director.
- (7) Except when stated so by the OEM, no calendar and cycle limitations imposed by the manufacturer may be extended without prior approval of the Director.

(8) The recording system, to be used to ensure compliance with this programme, shall be as follows:

(Please indicate fully the method of record keeping to be adopted)

7. Mandatory modification and special inspections

- (1) Unless the Director has approved an amendment to this programme, compliance with all modifications or special inspections that the manufacturer of the aircraft, its engines, propellers, instruments and installed equipment considers mandatory by a certain date or time shall be met by that date or time. Failure to comply with the aforementioned requirements will invalidate the C of A. See also section 3(5)(c) and (d) of Section A of Technical Standard 43.02.8.
- (2) Part 4 of this Maintenance programme may contain a list of modifications and special inspections, hereinafter referred to as Airworthiness Directives (ADs), that are issued by the State of Type Design, State of Type Certificate Holder, State of Manufacture or the Director. These may include some of the modifications and inspections referred to in paragraph (1) above, or may be additional thereto. Compliance shall be met in accordance with the requirements contained in the applicable AD and not later than the time stated therein. In the event of any conflict between the modifications and special inspections classified as essential and mandatory by the manufacturer or ADs issued by the Director, the provisions of the latter shall prevail.
- (3) Revisions, cancellations or additions to the Part, referred to in subparagraph (2) above, will be issued as necessary. The requirements shall be complied with not later than the time or date specified. In the event where compliance cannot be met, the requirements of subsection (2) above shall apply with the necessary changes.

8. Certificates of release to service

- (1) A Certificate of Release to Service, as prescribed in Part 5 of this programme and issued in accordance with the requirements of the Civil Aviation Regulations, as amended, shall be valid for the interval between any successive checks not to exceed 24 months or on completion of an inspection cycle required by this Maintenance programme not to exceed 24 months.
- (2) When a Certificate of Release to Service becomes invalid due to an aircraft sustaining a defect, its validity will be restored when the defect, that caused it to become invalid, is rectified and such rectification has been certified by a person authorised in terms of CAR 43.04.1.
- (3) When compliance with any Scheduled check is extended in terms of paragraph 2 of Part 2 of this programme, the person(s) extending the check shall issue a new Certificate of Release to Service valid only for the extended period.

- (4) Should the aircraft sustains a serious defect, its certificate of airworthiness and release to service shall automatically become invalid. The certificates will be revalidated once an inspection and repair of the aircraft has been performed to the satisfaction of the Director by a person or body of persons acceptable to him or her, and the Director has satisfied himself or herself that the aircraft can once again be operated safely.

9. Avionics, instrumentation and electrical

No person shall sign a release to service for avionics, instrument or electrical systems, unless that person has been authorised by, and holds the necessary certification issued by, an approved aircraft maintenance organisation.

10. Amendments

- (1) This maintenance programme specifies the minimum maintenance considered necessary to maintain the aircraft to which it refers in an airworthy condition. No amendment to this maintenance programme may be made without the prior written approval of the Director.
- (2) Subsection (1) is not to be construed as prohibiting any additional maintenance, not specifically mentioned in this programme that may be required to ensure that the aircraft can be operated safely. Such maintenance may be undertaken without the approval of the Director, provided the latter is advised of such requirement and an application for the amendment of this maintenance programme is made accordingly. The Director may wave the amendment requirement.
- (3) Amendments to this Maintenance programme shall become effective on the date of approval by the Director or otherwise as indicated in section 1(5) of [Part 1](#) of this programme.
- (4) The user of this Maintenance programme shall, prior to use, ensure that it has been amended to date.

11. Aircraft inspection report

An aircraft inspection report form CA 43.02 shall be submitted at intervals not exceeding 12 months, commencing on the date of validation of the C of A. If the aircraft is unserviceable at the time when the applicable form should be completed and submitted, the interval may be extended until the aircraft is airworthy again.

12. Duplicate inspections

- (1) A duplicate inspection of all engine and flight control systems must be carried out after the initial assembly and at any time the systems are disturbed in any way. The purpose of the duplicate inspection is to verify that the manufacturer's specifications and requirements have been met in detail.

(2) An initial inspection of the control system must be made and certified immediately after the maintenance is completed. A duplicate inspection of the controls being worked on must be made by a person referred to in CAR 43.04.1 prior to further flight. See also CAR 43.04.7 "Duplicate Inspection of flight and engine Controls". The following applies for aircraft with a MCM less than 5700 kg:

(a) A duplicate inspection of all engine and flight control systems shall be carried out after initial assembly and at any time the systems have been disturbed in any way. The purpose of the duplicate inspection is to verify that the manufacturer's specifications and requirements have been met in full and the system meets the requirements.

(b) An initial inspection of the control system shall be made and certified by a person in possession of a valid Aircraft Maintenance Engineer's (AME) License, or who has been approved by the Director as an Inspector in an Organization, or holds company certification as prescribed in Part 145 of the CAR immediately after the maintenance is completed and before the aircraft is flown. Persons qualified to perform and certify duplicate inspections are:

(i) A type-rated AME or person holding valid company certification in terms of Part 145 of the CAR, as amended.

(ii) An AME, holding a valid license for the particular category, but not type rated.

(iii) The holder of a valid company certification on a similar type of aircraft falling within the group.

(iv) The holder of a valid Airline Transport Pilot License/Commercial Pilot Licence rated on the type concerned, if the persons referred to in subparagraph (i); (ii) or (iii) are not available.

The AMO should define in its Manual of Procedure the criteria it will follow to ensure that the duplicate inspection is satisfactory conducted

13. Rectification of unsatisfactory items

(1) When during any inspection or at any other time any part, product, component or item is found to be unserviceable or, in the opinion of the supervising licensed aircraft maintenance organisation is unlikely to remain serviceable under normal operating conditions during the period preceding the next scheduled inspection, such rectification action as the supervising person considers to be necessary shall be taken to restore or extend the serviceability of the part, component or item prior to returning the aircraft to service.

(2) All deferred defects shall be transferred from the flight folio and all work involved in restoring the serviceability of any part, component or item shall be clearly recorded in the relevant logbook or other approved recording system and be certified by an appropriately rated person or certificate holder.

(3) Where aircraft are operating away from base for any length of time, copies of the above mentioned flight folios shall be submitted every seven (7) days to the base in the Republic where the records are normally kept.

(4) The Certificate of Airworthiness is invalid until the unsatisfactory items have been rectified or the items have been deferred in accordance with the approved MEL, DDM or CDL requirements.

14. Associated documents

(1) During the maintenance of the 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 SA-CATS 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 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).

(2) In the event of any conflict between the requirements or instructions issued by a manufacturer and those of the Director, the provisions of the latter shall prevail.

(3) It is a requirement that all relevant aircraft documents be available at the time of inspection and that such documents are current and amended to date. No inspection is to be certified unless all requirements in respect thereof have been satisfied.

(4) The following is a list of documents which are to be valid, current or amended to date, as the case may be, and shall be checked prior to the aircraft being released to service:

(a) Certificate of Registration No.

(b) Certificate of Airworthiness No.
Expiry date

(c) Radio Station Licence No.
Expiry date

(d) Certificate of Release to Service

(e) Approved Flight Manual

(f) Mass and Balance and Equipment List data

(g) Flight Folio

- (h) MEL (not applicable)
- (i) Aircraft logbook/s
- (j) Reduced Vertical Separation Minimum (RSVM) certificate
- (k) Noise certificate
- (l) Engine emission certificate (if applicable)
- (m) Fuel venting certificate (if applicable)
- (n) Approved Maintenance Programme

PART 2: SCHEDULED AND UNSCHEDULED INSPECTIONS

- (1) The complete periodic inspection cycle of time-limited and maintenance checks shall be as follows:

Check to be done at intervals not exceeding: (Refer to OEM criteria)

(Specify)

- (2) Notwithstanding the requirements contained in paragraph 1, it shall be permissible under this programme for an appropriately certificated person nominated by the Accountable Manager of an approved aircraft maintenance organisation, as referred to in [Part 145](#), to extend any scheduled check by not more than ten per cent where the aircraft manufacturer or type certificate holder has approved such an extension: Provided that –

- (a) the person has inspected the aircraft and satisfied himself or herself that the aircraft can be operated safely for the extended period;
- (b) his or her authority for the extension is entered in the aircraft logbook prior to the aircraft being operated for the extended period;
- (c) a certificate of release to service has been made out and certified in the correct manner; and
- (d) the extension shall be deducted from the next scheduled inspection period by an equal amount or as per the requirements of the OEM.

- (3) During the extended period all other scheduled checks and inspections falling due must be carried out within the times specified in subsection (1), but these may also be extended subject to the above requirements having been satisfied.

- (4) The Director may extend any scheduled inspection by a further 2% if the operator has an acceptable reliability programme in place and the operator can prove that safety will not be jeopardised.

(5) Except when stated so by the OEM, no extension may be granted in respect of calendar times. Thus, an aircraft may not be flown without written approval from the Director after a calendar period of validity has lapsed.

(6) During operations an aircraft may be subjected to –

(a) hard or overweight landings;

(b) operations outside the normal flight envelope; i.e. aircraft design speed or placarded speed of flaps or landing gear;

(c) severe air turbulence or severe manoeuvres;

(d) lightning strikes;

(e) foreign-object damage;

(f) propeller strikes;

(g) towing - including high drag or side loads due to ground handling.

Note: If any of the foregoing occurs, the manufacturer's recommendations shall be followed. If no specific procedures are prescribed for the particular type of aircraft, the Director must be consulted, and an alternate method of compliance be submitted for approval, based on approved data from a person or body of persons responsible for the continued airworthiness of the aircraft.

(7) Fuel flow checks are to be carried out in accordance with the aircraft's maintenance manual and the results recorded:

(a) at any time the fuel system has been worked on; and

(b) at any time the operator encounters fuel system starvation problems.

(8) Installed avionics equipment shall be checked for proper operation. See also TS 43.02.6, TS 43.02.10 and TS 43.02.11.

PART 3: OVERHAULS AND SUBSTITUTION OF CLASS I AND II PRODUCTS

(1) Extension intervals as published by the Original Equipment Manufacturer (OEM) may be used, or as listed in Table 1 are extension intervals that the Director allows to be granted to the Time Between Overhauls (TBO) in respect of the aircraft and installed equipment when there are no such intervals published by the manufacturer.

(2) An appropriately certified person nominated by the Accountable Manager of an approved aircraft maintenance organisation may extend any TBO provided that he or she has satisfied himself or herself from the performance, condition and recorded history and approved data for the component concerned that it can be operated safely for the extended period and that his or her authority for the extension is entered, in accordance with subsection (3) below in the appropriate logbook or other appropriate approved record prior to the component concerned is operated for the extended period.

Table 1		
Prescribed TBO's		Maximum extension period permitted, unless the Director approves otherwise
<u>(i)</u>	<u>Up to 3 000 hours</u>	<u>100 hours</u>
<u>(ii)</u>	<u>3 001 to 6 000 hours</u>	<u>200 hours</u>
<u>(iii)</u>	<u>6 001 to 9 000 hours</u>	<u>300 hours</u>
<u>(iv)</u>	<u>9 001 and greater</u>	<u>400 hours</u>

These extension periods may NOT be granted, if the OEM has stipulated an escalation programme approved by the Director. Escalation programmes do not qualify for these extensions.

- (3) On each occasion that an extension is granted in terms of subsection (2) above, the person authorising the extension shall certify the following entry in the appropriate logbook:

"I hereby certify that I have satisfied myself, after consulting approved data and historical records of its performance since new or last overhaul, and the condition of (name the product or component concerned giving a description and quoting part and serial number), the latter is such that it can be operated safely for a further hours of flight time. I hereby authorise such extension.

The current total airframe hours are:

Signature:

Approval/Licence No. :Date:

- (4) The current status of life-limited products and parts, whether it be hours, cycles or calendar time must be available.
- (5) Except when stated so by the OEM, no calendar and cycle limitations imposed by a manufacturer may be extended without prior approval of the Director. Application with respect to this type of extension must be made in accordance with CAR 43.02.1.
- (6) A list of the life limited components to be attached here.

PART 4: AIRWORTHINESS DIRECTIVES AND OTHER SERVICE INFORMATION

- (1) Airworthiness Directives (AD's) which concern the aircraft to which this maintenance programme applies (including installed equipment) are dealt with in this Part.
- (2) The registered owner or operator 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 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.
 - (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;
- (4) Requirements quoted in AD's are periodically revised. Each user of this programme shall ensure that such publications are up to date when used, and shall also ensure that any retrospective action required by any publication revision is complied with as and when required.
- (5) Modifications and special inspections shall be accomplished not later than the time or date specified against each item. Should the certifying person find that, due to circumstances beyond his or her control, he or she is unable to comply with the manufacturer's instructions regarding the specified time or date, written exemption from compliance must be requested and an acceptable alternate means of compliance must be submitted to the Director for consideration together with all substantiating data. Such approval must be obtained prior to further flight.
- (6) Deferred modifications or special inspections shall be accomplished as soon as the circumstances requiring the postponement no longer exist, but in any event not later than the written extension granted by the Director. An alternate method of compliance may be considered by the Director upon submission of acceptable substantiating data.
- (7) Modifications and special inspections required by the manufacturer of the airframe, engine, propeller, component or installed equipment are made known by way of SB's, SL's, Sir's, modification bulletins or other similar technical information. Such information is generally classified by the manufacturer to indicate the degree of essentiality. Licence

holders or authorised persons who certify the inspections required by this schedule are to ensure that their organisation possesses and keeps up to-date all such information that is to be brought to the notice of the aircraft owner or operator. No aircraft may be released to service with Airworthiness Directives that has not been complied with as yet.

- (8) All modifications and special inspections classified by the manufacturers 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.
- (9) The accomplishment of any modification or special inspection is to be recorded on the page provided for in the appropriate logbook and certified by the licensed or authorised person who performed the maintenance.

PART 5: DOCUMENTATION

Insert copy of Certificate of Release to Service for aeroplanes with an MCM less than 5 700 kg, as prescribed in Annexure B 2, and amended to reflect the details of the issuing AMO.

PART 6: RELIABILITY PROGRAMME

Attach Reliability Programme or make reference to a separate Reliability Programme document Number.

43.02.9 AIRSPEED INDICATOR AND ALTIMETER SYSTEM TESTS AND INSPECTIONS

1. Tests and inspections

- (1) The manufacturer's tests and inspection procedures must be complied with, taking into account the SACAA 12 month regulatory requirements, when no reference has been given by the manufacturer, the following referred to in CAR 43.02.9 must be complied with:

Note: The manufacturer's requirements and tolerances must be strictly adhered to with regards to tests on RVSM approved aircraft.

- (2) The pitot static pressure system test to be performed annually

(a) Ensure freedom from entrapped moisture and restrictions.

(b) Ensure the leakage is within the following established tolerances:

- (i) For unpressurised aeroplanes, evacuate the pitot static pressure system to a pressure differential of approximately 1 inch of mercury or to a reading, on the altimeter, 1 000 feet above the aircraft elevation at the

time of the test. Without additional application of pressure, the loss of indicated altitude must not exceed 100 feet on the altimeter over a period of 1 minute.

- (ii) for pressurised aeroplanes, evacuate the pitot static pressure system until a pressure differential equivalent of the maximum cabin differential for which the aeroplane is type certificated is achieved. Without additional application of pressure, the loss of indicated altitude must not exceed 2 per cent of the equivalent altitude of the maximum cabin differential pressure or 100 feet, whichever is the greater, over a period of 1 minute.
- (iii) Determine that the pitot head/s and static ports heater/s, if installed, are operative.
- (iv) Ensure that no alterations or deformations of the airframe surface have been made that would affect the relationship between air pressure in the pitot head/s, static pressure system and true ambient static air pressure for any flight condition.

(3) The airspeed indicator(s) and altimeter(s) tests to be performed annually

- (a) When tests are conducted with the temperature substantially different from an ambient temperature of approximately 25 degrees Celsius, allowance must be made for the variation from the specified condition.
- (b) Airspeed indicator/s and Altimeter/s tests must be carried out by an appropriately rated aircraft maintenance organisation, approved under Part 145, in accordance with the following:
 - (i) Airspeed indicators:
 - (aa) For aircraft flown under IFR, pitot system tests for the airspeed indicator must be tested in accordance with the manufacturer's instructions;
 - (bb) For aircraft flown under VFR only, pitot system tests for the airspeed indicator must be tested in accordance with the manufacturer's instructions, if available, or otherwise as follows:
 - (A) Apply sufficient pressure to an annually calibrated airspeed indicator test box at the pitot head to cause the airspeed indicator to indicate 150 knots, or up to the maximum air speed red line for aircraft that cannot reach 150 knots airspeed;
 - (B) After one minute, the leakage should not exceed 10 knots, or 7% of the lower speed tested;
 - (C) Should the aircraft's speed indicator not read the same airspeed as the airspeed indicator in the test box, the allowable tolerance to ensure that the aircraft's airspeed indicator is accurate is indicated in table 5 below.

Warning: Do not apply suction to the pitot head.

(ii) Altimeters:

(aa) Scale Error

The altimeter must, with the barometric pressure scale at 1013,25 millibars (1 Hecto Pascal = 1 millibar), be subjected successively to pressures corresponding to the altitude listed in Table 1 up to the maximum normally expected operating altitude of the aircraft in which the altimeter is to be installed.

The reduction in pressure must be made at a rate not exceeding 2 000 feet per minute to within approximately 200 feet of the test point.

The test point must be approached at a rate compatible with the test equipment.

The altimeter must be kept at the pressure corresponding to each test point for at least 1 minute, but not more than 10 minutes, before a reading is taken.

The error at all test points must not exceed the tolerances listed in Table 1.

(bb) Hysteresis

The hysteresis test must begin not more than 15 minutes after the altimeter's initial exposure to the pressure corresponding to the upper limit of the scale error tests prescribed in subparagraph (3)(a) and the hysteresis test must commence while the altimeter is at this pressure.

Pressure must be increased at a rate simulating a descent in altitude at the rate of 500 to 2 000 feet per minute until within 3 000 feet of the first test point (50 percent of maximum altitude).

The test point must then be approached at a rate of approximately 3 000 feet per minute.

The altimeter must be kept at this pressure for at least 5 minutes, but not more than 15 minutes, before the test reading is taken.

After the reading has been taken, the pressure must be increased further, in the same manner as before, until the pressure corresponding to the second test point (40 percent of maximum altitude) is reached.

The altimeter must be kept at this pressure for at least 1 minute, but not more than 10 minutes, before the test reading is taken.

After the reading has been taken, the pressure must be increased further, in the same manner as before, until atmospheric pressure is reached.

The reading of the altimeter at either of the two test points may not differ by more than the tolerance specified in Table 2 from the reading of the altimeter for the corresponding altitude recorded during the scale error test prescribed in subparagraph (b)(i).

(cc) After effect

Not more than 5 minutes after the completion of the hysteresis test prescribed in subparagraph (b)(ii), the reading of the altimeter, corrected for any change in atmospheric pressure, may not differ from the original atmospheric pressure reading by more than the tolerance specified in Table 2.

(dd) Friction

The altimeter must be subjected to a steady rate of decrease of pressure approximating 750 feet per minute. At each altitude listed in Table 3, the change in reading of the pointers after vibration may not exceed the corresponding tolerance listed in Table 3.

(ee) Case Leak

The leakage of the altimeter case, when the pressure within it corresponds to an altitude of 18 000 feet, may not change the altimeter reading by more than the tolerance shown in Table 2 during an interval of 1 minute.

(ff) Barometric Scale Error

At constant atmospheric pressure, the barometric pressure scale must be set at each of the pressures, falling within its range of adjustment that are listed in Table 4, and must cause the pointer to indicate the equivalent altitude shown in Table 4 with a tolerance of 25 feet.

(iii) Airspeed indicators and altimeters which are of the air data computer type with associated computing systems, or which incorporate air data correction internally, may be tested in a manner and to specifications developed by the manufacturer that are acceptable to the Director.

(4) The automatic pressure altitude reporting equipment and ATC transponder system integration test

(a) Conduct each test in accordance paragraph (b).

(b) Measure the automatic pressure altitude at the output of the installed ATC transponder when interrogated on Mode C at a sufficient number of test points

to ensure that the altitude reporting equipment altimeters and ATC transponders perform their intended functions as installed in the aircraft.

- (c) The difference between the automatic reporting output and the altitude displayed at the altimeter may not exceed 125 feet.
- (d) All mercury barometers used for the testing of altimeters are to be periodically checked/calibrated as often as deemed necessary by the manufacturer, or every 2 years by ICAO standards, whichever is shorter, or as required by the Director.

Table 1: Scale error

<u>Altitude</u>	<u>Equivalent pressure (millibars)</u>	<u>Tolerance ± (feet)</u>	<u>Altitude</u>	<u>Equivalent Pressure (millibars)</u>	<u>Tolerance ± (feet)</u>
<u>-1 000</u>	<u>1050.36</u>	<u>20</u>	<u>14 000</u>	<u>595.21</u>	<u>100</u>
<u>0</u>	<u>1013.25</u>	<u>20</u>	<u>16 000</u>	<u>549.12</u>	<u>110</u>
<u>500</u>	<u>995.06</u>	<u>20</u>	<u>18 000</u>	<u>505.98</u>	<u>120</u>
<u>1 000</u>	<u>977.15</u>	<u>20</u>	<u>20 000</u>	<u>465.62</u>	<u>130</u>
<u>1 500</u>	<u>959.51</u>	<u>25</u>	<u>22 000</u>	<u>427.89</u>	<u>140</u>
<u>2 000</u>	<u>942.10</u>	<u>30</u>	<u>25 000</u>	<u>376.01</u>	<u>155</u>
<u>3 000</u>	<u>908.10</u>	<u>30</u>	<u>30 000</u>	<u>300.87</u>	<u>180</u>
<u>4 000</u>	<u>875.09</u>	<u>35</u>	<u>35 000</u>	<u>238.43</u>	<u>205</u>
<u>6 000</u>	<u>811.97</u>	<u>40</u>	<u>40 000</u>	<u>187.53</u>	<u>230</u>
<u>8 000</u>	<u>752.61</u>	<u>60</u>	<u>45 000</u>	<u>147.47</u>	<u>255</u>
<u>10 000</u>	<u>696.12</u>	<u>80</u>	<u>50 000</u>	<u>115.98</u>	<u>280</u>
<u>12 000</u>	<u>644.38</u>	<u>90</u>	<u>-</u>	<u>-</u>	<u>-</u>

Table 2: Test tolerances

<u>Test</u>	<u>Tolerance ± (feet)</u>
<u>Case Leak Test</u>	<u>100</u>
<u>Hysteresis Test First test point (50% of maximum altitude)</u>	<u>75</u>
<u>Second test point (40% of maximum altitude)</u>	<u>75</u>
<u>After effect test</u>	<u>30</u>

Table 3: Friction

<u>Altitude ((feet)</u>	<u>Tolerance ±</u>	<u>Altitude (feet)</u>	<u>Tolerance</u>
<u>1 000</u>	<u>70</u>	<u>20 000</u>	<u>100</u>
<u>2 000</u>	<u>70</u>	<u>25 000</u>	<u>120</u>
<u>3 000</u>	<u>70</u>	<u>30 000</u>	<u>140</u>
<u>5 000</u>	<u>70</u>	<u>35 000</u>	<u>160</u>
<u>10 000</u>	<u>80</u>	<u>40 000</u>	<u>180</u>
<u>15 000</u>	<u>90</u>	<u>50 000</u>	<u>250</u>

Table 4: Pressure altitude

<u>Pressure in Millibars</u>	<u>Altitude (feet)</u>
<u>951.55</u>	<u>- 1 727</u>
<u>965.10</u>	<u>- 1 340</u>
<u>982.03</u>	<u>- 863</u>
<u>998.96</u>	<u>- 392</u>
<u>1013.25</u>	<u>0</u>
<u>1032.82</u>	<u>+ 531</u>
<u>1046.37</u>	<u>+ 893</u>
<u>1049.41</u>	<u>+ 974</u>

Table 5: Airspeed indicator scale tolerance & friction

<u>AIRSPEED INDICATION KNOT / MILES PER HOUR</u>	<u>SCALE ERROR TOLERANCES (KTS / MPH)</u>	<u>FRICITION TOLERANCE (KTS / MPH)</u>
<u>40</u>	<u>± 2,5</u>	<u>± 3</u>
<u>60</u>	<u>± 2,5</u>	<u>± 3</u>
<u>80</u>	<u>± 2,5</u>	<u>± 3</u>
<u>100</u>	<u>± 2,5</u>	<u>± 3</u>
<u>120</u>	<u>± 2,5</u>	<u>± 3</u>
<u>140</u>	<u>± 2,5</u>	<u>± 3</u>

<u>160</u>	<u>+ 2,5 / - 3,5</u>	<u>± 3</u>
<u>180</u>	<u>+ 2,5 / - 3,5</u>	<u>± 3</u>
<u>200</u>	<u>+ 2,5 / - 3,5</u>	<u>± 3</u>
<u>220</u>	<u>+ 2,5 / - 3,5</u>	<u>± 3</u>
<u>250</u>	<u>+ 2,5 / - 3,5</u>	<u>± 3</u>
<u>270</u>	<u>+ 2,5 / - 3,5</u>	<u>± 3</u>
<u>300</u>	<u>+ 3 / - 4</u>	<u>± 3</u>
<u>320</u>	<u>+ 3 / - 4</u>	<u>± 3</u>
<u>350</u>	<u>+ 3 / - 4</u>	<u>± 3</u>
<u>370</u>	<u>+ 3 / - 4</u>	<u>± 3</u>
<u>400</u>	<u>+ 4 / - 5</u>	<u>± 3</u>
<u>430</u>	<u>+ 4 / - 5</u>	<u>± 3</u>
<u>450</u>	<u>+ 4 / - 5</u>	<u>± 3</u>

43.02.10 ATC TRANSPONDER TESTS AND INSPECTIONS

The manufacturer's tests and inspection procedures must be complied with, taking into account the SACAA 12 month regulatory requirements, when no reference has been given by the manufacturer, the following referred to in CAR 43.02.10 must be complied with.

1. Tests and inspections

(1) General

- (a) In this technical standard, ATCRBS means air traffic control radio beacon system.
- (b) The ATC transponder functional tests must be conducted annually using either a bench check or portable test equipment.
- (c) If portable test equipment with appropriate coupling to the aircraft antenna system is used, operate the test equipment for ATCRBS transponders at a nominal rate of 235 interrogations per second to avoid possible ATCRBS interference.
- (d) For Mode S, operate the test equipment at a nominal rate of 50 Mode S interrogations per second.
- (e) An additional 3 dB loss is allowed to compensate for antenna coupling errors during receiver sensitivity measurements conducted in accordance with subsection (4) below when using portable test equipment.

(2) Radio reply frequency test

- (a) For all classes of ATCRBS transponders, interrogate the transponder and verify that the reply frequency is $1\ 090 \pm 3$ MHz.
- (b) For classes 1B, 2B and 3B Mode S transponders, interrogate the transponder and verify that the reply frequency is $1\ 090 \pm 3$ MHz.
- (c) For classes 1B, 2B and 3B Mode transponders that incorporate the optional $1\ 090 \pm 1$ MHz reply frequency, interrogate the transponder and verify that the reply frequency is correct.
- (d) For classes 1A, 2A, 3A and 4 Mode S transponders, interrogate the transponder and verify that the reply frequency is $1\ 090 \pm 1$ MHz.

(3) Suppression test

When Classes 1B, 2B ATCRBS transponders, or classes 1B, 2B and 3B Mode S transponders are interrogated at a rate between 230 and 1 000 Mode 3/A interrogations per second or when Classes 1A and 2A ATCRBS Transponders, or Classes 1, 2A, 3A and 4 Mode S transponders are interrogated at a rate between 230 and 1 200 Mode 3/A interrogations per second –

- (a) verify that the transponder does not respond to more than 1 percent of ATCRBS interrogations when the amplitude of P_2 pulse is equal to the P_1 pulse; and
- (b) verify that the transponder replies to at least 90 percent of ATCRBS interrogations when the amplitude of the P_2 pulse is 9 dB less than the P_1 pulse. If the test is conducted with a radiated test signal, the interrogation rate shall be 235 ± 5 interrogations per second unless a higher rate has been approved for the test equipment used at that location.

(4) Receiver sensitivity test

- (a) Verify that, for any class of ATCRBS Transponder, the minimum triggering level of the receiver for the system is -73 ± 4 dbm, or that for any class of Mode S transponder, the minimum triggering level of the receiver for Mode S format (P_6 type) interrogations is -74 ± 3 dbm by use of a test set –
 - (i) connected to the antenna end of the transmission line; or
 - (ii) connected to the antenna terminal of the transponder with a correction for transmission line loss; or
 - (iii) utilising radiated signals.
- (b) Verify that the difference in Mode 3/A and Mode C receiver sensitivity does not exceed 1 db for either any class of ATCRBS transponder or any class of Mode S transponder.

(5) RF peak output power test

Verify that the transponder RF output power is within the following specifications for the class of transponder using the conditions prescribed in subsection (4)(a):

- (a) for class 1A and 2A ATCRBS transponders, the minimum RF peak output power is at least 21.0 dbw (125 watts);
- (b) for class 1B and 2B ATCRBS transponders, the minimum RF peak output power is at least 18.5 dbw (70 watts);
- (c) for class 1A, 2A, 3A and 4 and those Class 1B, 2B and 3B Mode S transponders that include the optional high RF peak output power, the minimum RF peak output power is at least 21.0 dbw (125 watts);
- (d) for class 1B, 2B and 3B Mode S transponders, the minimum RF peak output power is at least 18.5 dbw (70 watts);
- (e) for any class of ATCRBS or any class of Mode S transponders, the maximum RF peak output power does not exceed 27.0 dbw (500 watts).

(6) Mode S diversity transmission channel isolation test

For any class of Mode S transponder that incorporates diversity operation, verify that the RF peak output power transmitted from the selected antenna exceeds the power transmitted from the non-selected antenna by at least 20 db.

(7) Mode S address test

Interrogate the Mode S transponder using the correct address and at least two incorrect addresses and making the interrogations at a nominal rate of 50 interrogations per second and verify that it replies only to its assigned address.

(8) Mode S formats test

Interrogate the Mode S transponder with UF for which it is equipped and verify that the replies are made in the correct format using the surveillance formats UF=4 and 5. Verify that the altitude reported in the replies to UF=4 are the same as that reported in a valid ATCRBS Mode C reply. Verify that the identity reported in the replies to UF=5 are the same as that reported in a valid ATCRBS Mode 3/A reply, if the transponder is so equipped, using the communication formats UF=20, 21 and 24.

(9) Mode S all-call interrogations test

Interrogate the Mode S transponder with the Mode S-only all-call format UF=11, and the ATCRBS/Mode S all-call formats (1,6 microsecond P₄ pulse) and verify that the correct address and capability are reported in the replies (downlink format DF=11).

(10) ATCRBS-only all-call interrogation test

Interrogate the Mode S transponder with the ATCRBS-only all-call interrogation (0.8 microsecond P₄ pulse) and verify that no reply is generated.

(11) Squitter test

Verify that the Mode S transponder generates a correct squitter approximately once per second.

[Note: The tests in subsections (6) to (11) inclusive, apply only to Mode S transponders.]

43.02.11 EMERGENCY LOCATOR BEACON TESTS AND INSPECTIONS

1. Tests and inspections

The tests and inspections prescribed in CAR 43.02.11 are the following:

(1) Tests after installation

After installation, the emergency locator beacon must be tested in accordance with the manufacturer's instructions.

(2) Maintenance tests

(a) Tests shall be conducted only within the first five minutes of the hour and then only for a maximum of three audio sweeps of the transmitter. Outside this time framework, tests must be co-ordinated with the nearest ATS unit and with the South African Search and Rescue mission control centre (MCC) at telephone [27] (0)21 551-0700. A VHF receiver tuned to 121,5 MHz should be used to monitor the tests. The unit is tested by placing the ELT switch in the ON position. The emergency tone will be heard when the ELT is operating. Immediately after the test the ELT switch must be returned to the AUTO or OFF position, as required.

(b) If fitted, the ELT remote control should be switched through each mode of operation to determine that the equipment is operating according to the manufacturer's instructions.

(c) With the aircraft's engine/s off and the ELT transmitting, the aural monitor, if fitted, should be heard. If a visual monitor is provided, it should be visible from the pilot's normal seated position.

(d) To ensure that the ELT is not susceptible to inadvertent activation by conducted or radiated interference, tests should be conducted with all avionics equipment powered by the aircraft electrical power-generating system operating. The tests should be carried out with the ELT armed and monitored on 121,5 MHz and include the following steps:

(i) individually operate each item of electrical equipment and each system, except VHF/UHF communication transmitters, and evaluate all reasonable combinations of control settings and operating modes;

(ii) individually operate installed VHF/UHF transmitters on various frequencies over their frequency range;

- (iii) repeat the step under subparagraph (ii) with all electronic equipment operating collectively, evaluating reasonable combinations of control settings and operating modes.
 - (e) The above mentioned tests shall only be conducted on ELT's capable of transmitting on 121.5 MHZ only and does not apply to 406 MHZ ELT's. 406 MHZ ELT's are designed with a self-test capability for evaluating key performance characteristics. Initiating the ELT self-test function will not generate a distress alert in the Cospas-Sarsat System. However, it will use some of the ELT's limited battery power, and should only be used in accordance with the ELT manufacturer's guidance. The ELT manufacturer must be consulted if uncertainty exists before attempting a self-test. In rare circumstances there may be a need to activate a 406 MHz ELT in its operational mode for test purposes. Regardless of the ELT's location or the duration of activation, a 406 MHz ELT will be detected by at least one GEOLUT and it might also be detected by every LEOLUT in the System. The resulting distress alert message will be routed to every MCC in the Cospas-Sarsat System. Consequently, a great deal of coordination is required to ensure that all MCCs throughout the world are aware of test transmissions from ELT's in their operational mode and that they have programmed their equipment to respond accordingly. Requests to conduct a live beacon test should be directed to the Cospas-Sarsat MCC that services the location in which the test is planned. In view of the number of ELT's in service, coupled with the effort and resources required to coordinate a live ELT test, beacon owners and AMO's should be aware that authorization to activate a beacon for testing will only be granted in exceptional circumstances.

(3) Maintenance requirements

(a) Scheduled maintenance:

At intervals not exceeding twelve months, an installed ELT shall undergo an operational check, including the following items:

- (i) ELT and antenna installation security;
- (ii) antenna coaxial cable for corrosion, security and slack;
- (iii) remote-switch wiring for condition and security;
- (iv) battery corrosion;
- (v) operation of the controls; and
- (vi) placards for legibility.

(b) Batteries are required to be changed, or charged if applicable –

- (i) when the transmitter has been in use for more than one cumulative hour;
- (ii) when 50% of their useful life, or for rechargeable batteries 50% of their useful life of charge, as established by the transmitter's manufacturer under its approval, has expired: Provided that batteries (such as water-

activated batteries), that are essentially unaffected during probable storing intervals, are exempted from this latter requirement; and

(iii) on or before their expiration date.

(c) Manufacturers of ELTs are required to mark the expiration date of the battery on the outside of the transmitter. If a battery is replaced, the date stamped on the replacement battery serves as the new expiration date and must be marked on the outside of the ELT.

(d) At two-yearly intervals, the ELT must be removed for bench testing in accordance with the manufacturer's instructions. Such tests should include the impact switch operation and the transmitter output. Testing should only be conducted in a screened room, with the transmitter connected to a dummy load to limit radiation.

(4) Temporary removal of ELT

(a) CAR 91.04.23 provides for operating an aircraft with an inoperative ELT or without an ELT fitted.

(b) In the case of a flight under the above conditions –

(i) the ELT and a suitable cockpit location are required to be placarded

ELT

NOT INSTALLED *

NOT CARRIED *

INOPERATIVE *

* as applicable; and

(ii) the appropriate maintenance entries shall have been made in the aircraft logbook or approved alternate maintenance record, stating:

(aa) the ELT's make, model and serial number;

(bb) the date on which the ELT was removed;

(cc) the reason for removing the ELT; and

(dd) that the aircraft has been placarded in accordance with the provisions of subparagraph (i).

43.02.13 NON-DESTRUCTIVE TESTING

1. Personnel qualifications standards

(1) NDT qualification levels 1, 2 and 3

(a) *Level 1*

Reference to NDT Level 1 staff means such staff should be able, using written instructions and guidance as necessary from NDT level 2 or 3 staff to –

- (i) set up and calibrate the equipment;
- (ii) perform the specific NDT;
- (iii) interpret and evaluate for acceptance or rejection only in the case where the written instructions contain interpretative criteria; and
- (iv) report on the results.

(b) Level 2

Reference to NDT Level 2 staff means such staff should be able to –

- (i) assume NDT technical responsibility for an NDT organisation or section within a Part 145 or Part 148 approved organisation;
- (ii) carry out the level 1 duties without the limitations of subsection (1)(a)(iii);
- (iii) understand the NDT standards and specifications and be able to translate them into practical NDT instructions, adapted to the actual working conditions;
- (iv) choose the technique for the NDT method to be used;
- (v) interpret and evaluate results according to applicable standards and specifications;
- (vi) prepare written instructions;
- (vii) supervise all level 1 duties;
- (viii) organise and report the results of NDT;
- (ix) compile and certify a Certificate Relating to Maintenance (CRM) after satisfactory testing has been carried out and furthermore –
 - (aa) be thoroughly familiar with the scope and limitation of the NDT method; and
 - (bb) have a basic knowledge of product technology.

(c) Level 3

Reference to NDT Level 3 staff means such staff should be able to –

- (i) establish and organise methods, techniques, written instructions and procedures;
- (ii) interpret standards, specifications and procedures;
- (iii) assist in establishing NDT methods to be used, including acceptance and rejection criteria;

- (iv) audit any Part 145 or Part 148 approved organisation to ensure it meets the required NDT standards;
- (v) train and examine NDT Level 1 and 2 qualified staff;
- (vi) have sufficient knowledge in all NDT methods associated with the overall NDT responsibility and recognise the appropriate use thereof.

(d) Standards

(i) NDT Level 1, 2 and 3 standards are detailed in specification NAS-410 or its equivalent.

(ii) Other acceptable standards include:

> EN 473

> ISO 9712

> ATA 105

> PCN/GEN/92

> EN 4179

> SNT-TC-1A

> any accepted by the Director.

(e) Training authorities

The training authorities that are qualified to train NDT personnel to NAS-410 Level 3 are –

- (i) the British Authority of NDT;
- (ii) the American Society for NDT;
- (iii) any other international organisation which holds equivalent standards to subparagraphs (i) and (ii) above.

[Note: “NAS” stands for ‘National Aerospace Standard’ as issued by the US Aerospace Industries Association.]

2. NDT testing standard practices

- (1) The non-destructive testing standard practices acceptable to the Director are:
 - (a) Magnetic Particle Inspection: the manufacturer’s instructions and specification ASTM-E-1444 or its equivalent;

- (b) Fluoresant Penetrant Inspection: the manufacturer's instructions and specification ASTM-E-1417 or its equivalent;
- (c) Radiographic Inspection: the manufacturer's instructions and specification ASTM-E-1742 or its equivalent;
- (d) Eddy Current Inspection: the manufacturer's instructions or ADs, SBs, SLs and SIs;
- (e) Ultra Sonic Inspection: the manufacturer's instructions or ADs, SBs, SLs and SIs.
- (e) Thermography, the manufacturer's instructions or ADs, SBs, SLs and SIs.
- (f) Digital Radiography, the manufacturer's instructions or ADs, SBs, SLs and SIs.

43.02.15 MODIFICATIONS

1. Approved technical data

- (1) The following data is considered to be approved, if approved by the Director in terms of Part 21 -
 - (a) a minor design change approval;
 - (b) a major change approval to a type certificate;
 - (c) a supplemental type certificate;
 - (d) an airworthiness directive;
 - (e) a South African Technical Standard Order (ZA-TSO) for equipment;
 - (f) a South African part design/manufacturing approval (ZA-PMA);
 - (g) data approved under a type certificate;
 - (h) a repair design approval;
- (2) A TSO or PMA usually does not include installation eligibility, and hence may require additional approved or acceptable data to embody the equipment on an aircraft;

2. Acceptable technical data

- (1) In terms of CAR 43.02.15 (3), and subject to paragraph (b), any of the following is considered acceptable data -
 - (a) a type certificate data sheet;
 - (b) a foreign type certificate data sheet used for the issue of a type acceptance certificate;
 - (c) type design data for a type certificated product;
 - (d) design change data that supports a minor design change approved by the Director;
 - (e) data provided by the Director in an Advisory Circular;
 - (f) an airworthiness directive that gives a specific instruction for modification or repair;
 - (g) a supplemental type certificate issued by the following –

- (i) the Federal Aviation Administration of the United States of America;
 - (ii) the Civil Aviation Safety Authority of Australia;
 - (ii) Transport Canada;
 - (iv) the Civil Aviation Authority of New Zealand;
 - (v) the European Aviation Safety Agency;
 - (vi) the State of Design for the product concerned;
 - (h) supplemental type approvals issued by Transport Canada;
 - (i) Airworthiness Directives which have been issued by the authority of the State of Design for the Class I product concerned, which gives a specific instruction for modification or repair;
 - (j) data giving a specific instruction for modification or repair contained in a maintenance manual, repair manual, overhaul manual, instruction for continued airworthiness, service bulletin;
 - (k) data provided by the manufacturer of the product for which it is to be used and which is listed in the type certificate, or by reference in the type acceptance certificate;
 - (l) repairs conducted in accordance with repair design data provided by the OEM and approved by the authority of the State of Design for the Class I product concerned;
- (2) The technical data listed in paragraph (a) are acceptable if—
- (a) the data are appropriate to the product, component, or appliance being altered, and are directly applicable to the alteration being made and the work being carried out (i.e. there are no deviations from the approved design data); and
 - (b) for a foreign supplemental type certificate or supplemental type approval—
 - (i) a complete new flight manual is not introduced; and
 - (ii) the aircraft type is not re-designated; and
 - (iii) the data are supplemental to the particular type certificate accepted by the Director and that type certificate is referenced on the supplemental type certificate or supplemental type approval; and
 - (iv) the installer has the written permission of the holder of the supplemental type certificate or supplemental type approval to install the STC on the Class I product concerned; and
 - (c) data provided by the manufacturer of a component does not conflict with data provided by the manufacturer of the product or assembly of which the component is to form a part.
- (3) A statement of “No technical objection”, or similar wording, by the manufacturer does not constitute “approved” or “acceptable” data and shall not be used without further approval by the Director.

43.02.16 TEST FLIGHTS

1. General

- (1) The flight testing prescribed by CAR 43.02.16 shall be carried out by the holder of the appropriate test pilot rating issued in terms of Part 61, provided that the Director may approve the carrying out of flight tests by a person whose experience is considered to be adequate for satisfactorily assessing the flight characteristics and performance of a particular aircraft.
- (2) An aircraft that has undergone a major structural repair or a modification that may substantially affect its flight characteristics shall be flight-tested before it is returned to service. The outcome of the flight test(s) shall be passed to the owner or operator.
- (3) For complex aircraft the manufacturer's test flight procedure(s) may be utilised.

2. Requirements

(1) Recording of flight test results

(a) When an aircraft is flight-tested, the results are to be recorded on the following flight performance records:

- (i) Form CA 21.19 for single-engine fixed wing aircraft;
- (ii) Form CA 21.18 for multiple-engine fixed wing aircraft; and
- (iv) Form CA 21.34 for helicopters.

(b) The forms referred to in paragraph (a) shall be forwarded to the Director within 48 hours after the completion of the flight test.

(2) Mass of aircraft

The mass of the aircraft at the time of flight-testing must be established from the approved flight manual.

(3) Climb performance

(a) In order to check the climb performance of the aircraft, a controlled climb is to be made with the aircraft in the *en route* configuration.

(b) Prior to commencement of the test, the altimeter is to be set to 1013,2 hPA (mbs).

(c) Before commencing the climb the indicated airspeed should be allowed to stabilise to the appropriate climbing speed and the power then applied gradually and the aircraft eased into the climb, endeavouring to maintain the correct speed. Care must be taken to ensure that the initial times and altitudes are recorded when the aircraft has settled down in the climb and the airspeed should then be kept to within ± 2 knots.

(d) In the case of twin piston-engine aircraft, the climb is to be made with the critical engine inoperative and the propeller feathered. The power setting on the

operative engine should be set as specified in the approved flight manual. For single-engine aircraft the engine is to be operated at maximum continuous or climb power for a maximum period of five (5) minutes.

(e) The test climb should not be carried out in or near cloud or in turbulent air and a steady heading should be maintained throughout.

(4) Helicopters

(a) Helicopters must perform an in-ground effect hover test in still air conditions at a helicopter mass as specified in the approved flight manual for prevailing atmospheric conditions.

(b) For a helicopter powered by reciprocating engines the hover test results must also be plotted on hover performance graphs given in the approved flight manual. These results must be attached to the prescribed form .

(c) Helicopters powered by turbine engines must undergo a power assurance check according to data given in the approved flight manual. The results must be plotted on the power assurance graphs given in the approved flight manual. These results must be attached to Form CA 21.34.

43.02.17 TEMPORARY AND PERMANENT REPAIRS AFTER ACCIDENTS OR INCIDENTS

1. Requirements

(1) The following procedures must be followed whenever temporary or permanent repairs become necessary after an accident or incident, irrespective of the extent of the damage to a Class I product:

(a) Once it has been established that the aircraft must be repaired after an accident, the owner or operator of the aircraft must supply the Director with the following:

- (i) the aircraft's nationality and registration marks and its location;
- (ii) the extent of the reported damage;
- (iii) a copy of all proposed repairs obtained from the AMO, AME or approved repair facility concerned prior to commencing the repairs; and
- (iv) a detailed schedule of all the repairs to be performed by the AMO, AME or approved repair facility.

(b) When all the repairs have been completed the owner or operator shall advise the Director accordingly and arrange for an inspection by an airworthiness inspector or an approved person.

(c) The owner or operator of an aircraft may arrange for an AMO, AME or an approved repair facility to act on his or her behalf and recover and return the aircraft to service. In this case he or she shall ensure that the Director is advised of his or her arrangement with the AMO, AME or approved repair facility. The

AMO, AME or approved repair facility shall comply with the contents of paragraphs (a) and (b) in addition to the requirements prescribed in paragraph (d).

- (d) The aircraft maintenance organisation (AMO), approved repair facility, or aircraft maintenance engineer (AME) concerned must –
- (i) submit to the Director –
 - (aa) the name(s) of valid type-rated AMEs who will be responsible for the carrying out of the repairs;
 - (bb) a detailed description of the manner in which the repairs are to be effected; and
 - (cc) a detailed specification of all the repairs to be made in order to fly the aircraft safely to a base where it can be permanently repaired;
 - (ii) certify the temporary or permanent repairs in the appropriate logbook(s) or flight folio, and forward copies of such certification or Certificates Relating to Maintenance of an Aircraft to the Director;
 - (iii) ensure that only an appropriately licensed and rated person, as prescribed in CAR 43.04.7, certifies the duplicate inspection on all controls when temporary repairs are made to an aircraft;
 - (iv) supply the area airworthiness inspector with copies of the documentation, referred to in SUBparagraph (I);
 - (V) after certifying the aircraft as safe for flight, obtain from the Director an authority to fly the aircraft (which authority is valid for flight within the borders of the Republic); and
 - (VI) advise the Director in writing when the flight has been completed.
- (e) Those responsible for temporary repairs shall ensure that such repairs are carried out in accordance with standard aviation practices or in a reasonable manner.

2. Reinstatement of C of A following an accident or incident

To reinstate the validity of a certificate of airworthiness deemed suspended as a result of an aircraft having been involved in an accident or incident that rendered one or more Class I products unserviceable, the following applies:

- (a) Such maintenance as is necessary shall be carried out in accordance with approved manuals, structural repair manuals, or authorised repair schemes or other approved data.
- (b) A mandatory periodic inspection (MPI) or other inspection as prescribed in Technical Standard 43.02.8 shall be carried out if the major primary structure, the engine(s) or the propeller(s) have been damaged.
- (c) A test flight shall be done by an appropriately rated test pilot, and the performance recorded in accordance with CAR 43.02.16.
- (d) All documents pertaining to the repairs of an aircraft that sustained damage to the primary structure, its engine(s) or propeller(s), shall be inspected by an

authorized officer, inspector or authorized person after the necessary repairs have been carried out.

- (e) Copies of the certificates relating to maintenance (CRMA's) in respect of all repairs affected shall be submitted to the Director within 48 hours of the certificate of release to service (CRS) having been completed and certified.

43.02.18 AIRCRAFT COMPASS REQUIREMENTS

1. Compass swing requirements

- (1) All compasses fitted to South African registered aircraft must be swung as follows:

(a) On installation;

(b) at 12 monthly intervals thereafter: Provided that where other independent primary direction-indicating systems that do not required to be swung, are in use, the interval may be extended to 24 months. In such a case, the compass(es) shall be checked during each flight against such directing-indicating system. Should deviation exceed 5°, the compass shall be swung.

[Note: Whilst under the most favourable conditions an annual check is sufficient; it is recommended that owner of aircraft carry out a check swing every six months.]

(c) Before a newly registered aircraft is placed into service in the country;

(d) Immediately after material or equipment that may affect the compass is installed, removed or replaced;

(e) After an aircraft has been struck by lightning;

(f) After each engine change, except where it has been established that non-compliance with this requirement will not affect the compass readings. The Director must be advised accordingly;

(g) In the case of "cargo only" aircraft, whenever cargo which is likely to affect the compass reading is carried. In such cases a check must be made on the cardinal headings and headings to be flown and a temporary deviation card installed. The temporary card must be replaced when such cargo is unloaded;

(h) In the case of any primary compass, the compass swing shall be carried out with all common electrical equipment "N";

(i) In the case of any stand-by compass, the compass swing shall be carried out with all electrical equipment "FF".

- (2)(a) New generation aircraft (NG) are exempted from the requirements of subsection (1)(b), provided there are more than one back-up system that can verify heading direction

(b) The standby the magnetic compass is checked at specific intervals by means of procedure to detect discrepancies and is to be integrated on the pre-flight and en-route check.

(c) Compass swings are to be carried out:

- (i) when the actual is replaced
- (ii) when discrepancies are identified on the accuracy of the standby compass

2. Deviation cards

(1) A deviation card must be installed on or in close proximity to each compass or, for remote-reading compasses, the main indicator or repeaters and must contain the following information:

- (a) The readings at intervals not greater than 45 degrees.
- (b) Whether the compass was swung with electrical equipment switched on or off as applicable. The space marked A as shown on the examples of the deviation cards referred to in paragraph (f) below, may be used for this purpose.

[Note: Under certain conditions radio contact must be maintained with one aeronautical station at all times and if the radio receiver affects the compass, it will be necessary to install a card which will indicate the readings with such receiver switched on.]

- (c) The signature and licence number of the person responsible for the swing and the date it was carried out.
- (d) After a magnetic compass has been compensated the reading must be such that the residual deviation in level flight does not exceed 5 degrees on any heading.
- (e) Remote-reading compasses must be adjusted to obtain minimum deviations, but where the construction of the compasses is such that all deviation can be adjusted for, no deviation card will be necessary.
- (f) The compass deviation card must be completed in a manner similar to the examples shown below:

<u>Aircraft:</u>				<u>Electrical equipment ON/OFF *</u>				
<u>FOR</u>	<u>000</u>	<u>045</u>	<u>090</u>	<u>135</u>	<u>180</u>	<u>225</u>	<u>270</u>	<u>315</u>
<u>STEER</u>	<u>001</u>	<u>046</u>	<u>090</u>	<u>134</u>	<u>179</u>	<u>225</u>	<u>272</u>	<u>316</u>

<u>Aircraft:</u>		<u>Electrical equipment ON/OFF *</u>	
<u>FOR</u>	<u>STEER</u>	<u>FOR</u>	<u>STEER</u>
<u>000</u>	<u>001</u>	<u>180</u>	<u>179</u>
<u>045</u>	<u>046</u>	<u>225</u>	<u>225</u>

<u>090</u>	<u>090</u>	<u>270</u>	<u>272</u>
<u>135</u>	<u>134</u>	<u>315</u>	<u>316</u>

* delete as applicable.

(g) Deviation cards must be placed in holders provided for this purpose.

3. Logbook entries

The date on which the compass was swung must be entered in the airframe logbook and certified by an appropriately licensed and rated aircraft maintenance engineer, or the holder of a commercial pilot or airline transport pilot licence.

4. Compass swing areas and equipment

- (1) Before any compass is swung it must be established that the swinging area is free from unwanted magnetic effects and that the landing compass is serviceable.
- (2) Where the landing compass is replaced by a permanent base it must be borne in mind that the magnetic north on the base is not a fixed point but is a point which moves due to local magnetic variations. The magnetic bearings of the compass base must therefore be checked at periods not exceeding 4 years.

5. Qualifying experience for compensation of compasses

- (1) In terms of TS 66.02.4 (13) and (14), applicants for the issue or addition to a licence under Category "X" (Compasses) shall have had recent general practical experience satisfactory to the Director.
- (2) In the pursuance of this technical standard the minimum practical experience acceptable to the Director shall consist of the satisfactory carrying out of the compensation in aircraft, including the compilation of the final deviation cards, of a least three compasses of the type on which the applicant desires to be licensed. Such experience shall have been gained during the six months immediately preceding the application for the issue of or addition to a licence.
- (3) Compensation of compasses for the required practical experience is to be done under the supervision of the holders of appropriately rated aircraft maintenance engineers, commercial pilots or airline transport pilot licences.
- (4) Application for the issue of or addition to a licence under Category "X" for the compensation of compasses in aircraft must be accompanied by certificates from the persons supervising the compensations done for the required practical experience. Such certificates must indicate whether or not the compensations, including the compilation of the final deviation card, were satisfactorily carried out and also indicate the dates and aircraft registrations on which the compensations were made.

43.02.19 EXTENDED DIVERSION TIME OPERATIONS

The additional maintenance requirements for extended-range twin turbine-engine operations prescribed by CAR 43.02.19 are the following:

1. General

- (1) The maintenance programme shall contain the standards, guidance and direction necessary to support the intended operation. Maintenance and personnel involved shall be made aware of the special nature of EDTO and shall have the knowledge, skills and ability to accomplish the requirements of the programme.
- (2) An EDTO service check shall be developed to verify that the status of the aeroplane and certain critical items are acceptable. A qualified and authorised person should accomplish this check prior to any EDTO flight.

2. EDTO Manual

The operator shall include the following information in existing manuals used by personnel involved in EDTO:

(1) Oil Consumption Program

The oil consumption programme shall reflect the manufacturer's recommendations and be sensitive to oil consumption trends. It shall consider the amount of oil added at the departing EDTO stations with reference to the running average consumption; i.e. the monitoring must be continuous up to and including oil added at the EDTO departure station. If oil analysis is meaningful to the make and model, it should be included in the programme. If the APU is required for EDTO operation, it shall be added to the oil consumption programme.

(2) Engine Condition Monitoring

The engine condition monitoring programme shall describe the parameters to be monitored, the method of data collection and the corrective action process. The programme shall reflect the manufacturer's instructions and industry practice. This monitoring is used to detect deterioration at an early stage and to allow for corrective action before safe operation is affected. The programme should ensure that engine limit margins are maintained so that a prolonged single-engine diversion may be conducted without exceeding approved engine limits (i.e. rotor speeds, exhaust gas temperature) at all approved power levels and expected environmental conditions. Engine margins preserved through this programme should account for the effects of additional engine loading demands (e.g. anti-icing, electrical, etc.) which may be required during the single-engine flight phase associated with the diversion.

(3) Verification Programme after Maintenance

A verification programme or procedure shall be established to ensure corrective action following an engine shutdown, primary system failure or adverse trends for any prescribed events that require a verification flight or other action, and establish means to assure their accomplishment. A clear description of who must initiate verification actions and of the person responsible for the determination of actions must be described in the operator's EDTO manual.

(4) Reliability Programme

- (a) A reliability programme shall be developed or the existing reliability programme supplemented. This programme should be designed with early identification and prevention of EDTO related unsafe conditions as its primary goal. The programme should be event-orientated and incorporate reporting procedures for significant events detrimental to EDTO flights. This information shall be readily available for use by the operator and the CAA to help establish that the reliability level is adequate, and to assess the operator's competence and ability to safely carry out EDTO.
- (b) The Director shall be notified within 24 hours of events reportable through this programme. These reportable events include:
- (i) in-flight shutdowns;
 - (ii) diversion or turn-back;
 - (iii) uncommanded power changes or surges;
 - (iv) inability to control the engine or obtain desired power; and
 - (v) problems with systems critical to EDTO.
- (c) Each report shall identify the following;
- (i) aircraft identification;
 - (ii) engine identification (make and serial number);
 - (iii) total time, cycles and time since last inspection;
 - (iv) for systems, time since overhaul or last inspection of the defective unit;
 - (v) phase of flight; and
 - (vi) corrective action.

3. Maintenance Training Programme

- (1) The maintenance training programme shall be included with normal maintenance training. The goal of this programme is to ensure that all personnel involved in EDTO are provided with the necessary skill to properly accomplish the EDTO maintenance tasks, emphasising the special nature of EDTO maintenance requirements.
- (2) Qualified maintenance personnel are those that have completed the operator's extended-range training programme and have satisfactorily performed extended-range tasks under supervision within the framework of the operator's procedures for licensed or authorised personnel.

4. EDTO Parts control programme

The operator, in conjunction with the responsible AMO and the support of the manufacturer, shall develop a parts control programme that ensures that the proper configuration is maintained for EDTO. The objective of the programme is to ensure that parts fitted to EDTO aircraft, either in terms of a parts borrowing or pooling arrangement or during repair or overhaul, maintain the necessary EDTO configuration for that aircraft.

43.02.20 RVSM OPERATIONS

1. General

The integrity of the design features necessary to ensure that altimetry systems continue to meet RVSM approval criteria needs to be verified by scheduled tests and inspections in conjunction with an approved maintenance programme.

2. Maintenance facilities

Adequate maintenance facilities will need to be available to enable compliance with the RVSM maintenance procedures.

3. Maintenance requirements

- (1) Section 7 of Technical Standard 91.04.31 prescribes the requirements for continued airworthiness of the RVSM certification with regard to –
 - (a) maintenance programmes, including the Maintenance Control Manual;
 - (b) maintenance documents, including the approved Aircraft Maintenance Schedule and its MMEL;
 - (c) maintenance practices; and
 - (d) test equipment.
- (2) Subsection (7) of Section 6 of the aforementioned technical standard prescribes requirements for the amendment of the aircraft's Structural Repair Manual, for periodic inspections, and for in-flight defect reporting systems.
- (3) Appendix 3 to the aforementioned technical standard deals with the monitoring of static-source errors.

43.02.22 SUSPECTED UNAPPROVED PARTS

1. Meaning of unapproved for parts

- (1) A part is unapproved if:

- (a) the part is counterfeit; or
- (b) the part has not been approved in a manner mentioned in CAR 21.09.1 or 21.10.1; or
- (c) the part:
 - (i) is not a standard part; and
 - (ii) has been produced other than under an authorization (however described) granted by SACAA or an NAA; or
- (d) maintenance has been carried out on the part other than in accordance with an authorization (however described) granted by SACAA or an NAA; or
- (e) the part has been modified other than in accordance with a design for which there is a Part 21 approval; or
- (f) the part:
 - (i) is unserviceable or unsalvageable; and
 - (ii) has been fraudulently represented as serviceable; or
- (g) the part is accompanied by a fraudulent document.

2. Control of unapproved parts

- (1) If a person becomes aware that a part is unapproved, the person must ensure that the steps mentioned in subsection (2) are taken within 2 days after the person first became aware that the part was unapproved.
- (2) The steps are:
 - (a) applying a label, or attaching a tag, to the part recording the following:
 - (i) sufficient information to identify the part, including the part's name, part number and serial number (if any);
 - (ii) that the part is unapproved;
 - (iii) the origin of the part, including any information about the aircraft or aeronautical product from which the part has been removed, if relevant and if known to the person;
 - (iv) the reason that the part is unapproved; and
 - (b) storing the part, and any documents that accompanied the part, in a quarantine store and
 - (c) submitting a report about the part in accordance with CAR 43.02.22.

3. Reporting unapproved parts

- (1) For purposes of section 2(2)(c), the person must submit a report about the part to:
 - (a) The Director; and
 - (b) if the person knows that the part was fitted to an aircraft or aeronautical product — the type certificate holder or foreign type certificate holder for the aircraft or aeronautical product; and
 - (c) if the person knows that the part was fitted to an aircraft — the person responsible for continuing airworthiness for the aircraft.
- (2) The report must be made in the approved form.

4. Action by the Director following report of unapproved parts

- (1) If the Director receives a report about a part under CAR 43.02.22, the Director may, by notice in writing:
- (a) require the person who submitted the report to give the Director further information in relation to the part within a period specified in the notice; or
 - (b) tell the person who submitted the report that the part does not have to be kept.
- (2) The person must comply with a notice under subsection (1)(a).

5 Action required if parts not required to be kept

- (1) If the Director has given a person a notice under section 4(1)(b) in relation to a part, the person must, within 2 days after receiving the notice:
- (a) if the person is not the owner of the part — give the part to the owner of the part;
or
 - (b) store the part, and any documents that accompanied the part, in a quarantine store; or
 - (c) mutilate the part, or arrange for the part to be mutilated, in a manner that ensures that the part cannot be used in aviation.
- (2) If the owner of a part receives the part under subsection (1)(a), the owner must, within 2 days of receiving the part:
- (a) store the part in a quarantine store; or
 - (b) mutilate the part, or arrange for the part to be mutilated, in a manner that ensures that the part cannot be used in aviation.

43.03.1 MAINTENANCE RECORDS

1. Flight folios

The requirement for a flight folio to be carried, the information to be contained therein, the manner in which it shall be maintained and the period for which a flight folio shall be retained has been prescribed in CAR 91.03.5.

2. Recording of maintenance

- (1) An owner or operator shall ensure that the following records are kept:
- (a) the total time in service (hours, cycles and calendar time, as appropriate) of the aircraft and all life-limited components;
 - (b) the current status of compliance with all mandatory continuing airworthiness information;
 - (c) appropriate details of modifications and repairs to the aircraft and its major components;

- (d) the time in service (hours, calendar time and cycles, as appropriate) since last overhaul of the aircraft or its components that are subject to a mandatory overhaul life;
 - (e) the current status of compliance with the maintenance programme; and
 - (f) the detailed maintenance records to show that all requirements for signing of a certificate of release to service of an aircraft have been met.
- (2) The records referred to in subsection (1)(f) shall be kept for a minimum period of five years after the signing of the maintenance release.
 - (3) The records in paragraph (1)(a) to (e) shall be kept for a minimum period of 90 days after the unit to which they refer has been permanently withdrawn from service.
 - (4) In the event of a temporary change of operator, the records shall be made available to the new operator. In the event of any permanent change of owner or operator, the records shall be transferred to the new owner or operator.

43.03.3 RECORDING AND REPORTING OF MAJOR REPAIRS AND MAJOR MODIFICATIONS

1. Manner of recording

- (1) The manner in which repairs and modifications related to a major repair or major modification of an aircraft part or component shall be recorded in the applicable aircraft, engine or propeller logbook or on an Authorised Release Certificate as detailed in Annex D.
- (2) Only major modifications and major repairs to a Class I product are to be reported to the Director by means of form CA43-08.

2. Processing

- (1) Relevant data that should accompany the CA43-08 form include any changes to the approved aircraft documentation, such as copies of –
 - (a) the aircraft flight manual supplement,
 - (b) the instructions for continued airworthiness for the modification or repair,
 - (c) the supplemental type certificate and applicable model list,
 - (d) the documents required by the limitations and conditions of a supplemental type certificate,
 - (e) the amended equipment list,
 - (f) the amended mass and balance report (CA43-17 form), and
 - (g) a copy of the maintenance release for the modification or repair concerned.

43.04.4 CERTIFYING AFTER INSPECTION

1. Statement

The statement to be entered in the appropriate logbook or other maintenance record approved by the Director, as prescribed in CAR 43.03.4, is the following:

After a progressive inspection:

“I certify that Phase of the progressive inspection programme of aircraft (description) was performed in accordance with its progressive inspection programme and in accordance with the Civil Aviation Regulations, and is fit for release to service. or

After any other inspection:

“I certify that aircraft (description) has been inspected in accordance with a (identify inspection) inspection and in accordance with the Civil Aviation Regulations, as amended, and is fit for release to service.”

43.04.5 CERTIFYING AFTER MAINTENANCE

1. Statement

The statement to be entered in the appropriate logbook or other maintenance record approved by the Director, as prescribed in CAR 43.04.4, is the following:

“The work recorded above has been carried out in accordance with the Civil Aviation Regulations, as amended, and in respect of that work the aircraft is fit for release to service.

“Signature:

“Licence / authorisation number:

“Date of entry:

2. Form of certificate of release to service

The forms referred to in CAR 43.04.4, in which the release to certificate an aircraft or aircraft component is certified, are the forms contained in Annexes B1 and B2 (Aircraft) and Annex D (Components).

43.04.6 DISCREPANCIES

1. Statement

The statement to be entered in the appropriate logbook or flight folio, as prescribed in Regulation 43.04.5, is the following:

After a progressive inspection:

“I certify that Phase of the progressive inspection programme of aircraft (description) was performed in accordance with its progressive inspection programme and is not released to service. A list of discrepancies and non-airworthy items dated (date) has been submitted to the aircraft owner or operator and the Civil Aviation Authority responsible for continuous airworthiness records.”; or

After any other inspection:

“I certify that aircraft (description) has been inspected in accordance with a (identify inspection) inspection and is not released to service. A list of discrepancies and non-airworthy items dated (date) has been submitted to the aircraft owner or operator.”

Appendix 1

SCHEDULE OF TIMES BETWEEN OVERHAUL AND LIFE-LIMITED PARTS FOR AEROPLANES WITH A MAXIMUM CERTIFICATED MASS OF 5 700 KG OR LESS OR HELICOPTERS WITH A MAXIMUM CERTIFICATED MASS OF 3 175 KG OR LESS

[Note: See also Item 3 ‘Associated Documents’ in Section A of Technical Standard 43.02.8.]

1. AIRCRAFT

Components shall be replaced at the times indicated in the latest revised issues of the Maintenance Manuals, Airworthiness Directives (ADs), Service Bulletins (SBs) and Service Letters (SLs), as applicable.

2. ENGINES

Engines, (as referred to in Technical standard 43.02.5 3(1)), and engine components shall be overhauled at the recommended times indicated in the latest revised issues of the Maintenance Manuals, ADs, SBs and SLs, as applicable.

3. PROPELLERS

Propellers shall be overhauled at the recommended times indicated in the latest revised issues of the Maintenance Manuals, ADs, SBs and SLs, as applicable.
See Appendix 2 for propeller mid-life inspections and repair requirements.

4. EQUIPMENT

Installed equipment shall be overhauled or tested at the recommended times indicated in the latest revised issues of the Maintenance Manuals, ADs, SBs and SLs, as applicable.

Appendix 2

PROPELLER MID-LIFE INSPECTION AND REPAIR REQUIREMENTS

1. Flight-time and calendar limits

(1) Variable-pitch propellers (Hartzell and McCauley)

- (a) The latest issues of service information and overhaul manuals produced by the various propeller manufacturers specify the flight time and calendar limits applicable to the various propellers commonly used today.
- (b) This notwithstanding, calendar time limits may be extended as follows:
 - (i) on variable-pitch propellers fitted to aircraft engaged in normal operations, the time limit is ten (10) years, subject to a five (5) yearly (mid-life) inspection as prescribed in paragraph (d) read together with the conditions mentioned in paragraph (c);
 - (ii) for aircraft engaged in agricultural operations and acrobatics, the time limit is six (6) years, subject to a three-yearly (mid-life) inspection as prescribed in paragraph (d) read together with the conditions contained in paragraph (c);
 - (iii) other manufacturer's requirements remain unchanged.
- (c) At the time of the mid-life inspection the accumulated flight hours may not be more than half of the hours between overhaul as specified by the manufacturer. If the accumulated flight hours do exceed half of the manufacturer's time between overhauls a complete overhaul shall be carried out.
- (d) The mid-life inspection requirement is for the propeller to be dismantled, cleaned and inspected, paying particular attention to the following and taking the necessary remedial action:
 - (i) corrosion;
 - (ii) worn, damaged, cracked or otherwise unserviceable parts: life- limited parts to be replaced as required;
 - (iii) blades for cracks (the removal of serviceable de-icing boots is not mandatory unless required in terms of the maintenance manual, an AD or SB);
 - (iv) blade measurement: length, width, thickness and blade angles must be within the required serviceable limits and actual measurements must be recorded;
 - (v) applicable ADs and SBs must have been / be embodied;
 - (vi) all seals and gaskets must be replaced by new ones;
 - (vii) reassemble of the propeller and subsequent checking of balance.
- (e) All other conditions imposed by the various manufacturers remain in force.

- (2) Fixed-pitch propellers (Sensenich and McCaulley)
- (a) The requirements contained in fixed-pitch propeller manufacturer's service manuals and other data shall be adhered to.
 - (b) Propellers involved in propeller strikes must undergo a complete overhaul, provided the blades are within the straightening limitations specified. The following shall apply:
 - (i) after the blades have been successfully straightened, metal removal during the blade reconditioning should be at least 0.01 mm (.004 inch) per surface over the entire blade. This will afford an important benefit shifting the 2nd order – 1st mode resonance peak downward in the RPM range, as well as restoring the fatigue cycle life endurance;
 - (ii) a propeller so repaired shall be marked "Rep" with 3,175 mm (1/8th inch) high characters on the flat area of the front face of hub boss. Indicated the second and subsequent repairs by a number stamped on back face of the hub boss beginning with "2";
 - (iii) all information issued by the manufacturer of a propeller, which relates to the maintenance being carried out;
 - (iv) any requirements, including those contained in Airworthiness Directives and other service information; and
 - (v) Civil Aviation Regulations, 2011.
 - (c) The minimum overhaul requirements, apart from those set out in the overhaul manual or service publications are as follows:
 - (i) Inspect the propeller thoroughly for damage and corrosion, and rectify–
 - (aa) diameter;
 - (bb) blade width;
 - (cc) blade thickness;
 - (dd) face alignment;
 - (ee) blade angles;
 - (ff) edge alignment;
 - (gg) balance; and
 - (ii) keep record of findings.

[Note: All measurements must be within the maker's specifications.]

- (d) It is a requirement that a thin layer of the metal surface be removed which affords an important benefit shifting the 2nd order - 1st mode resonance peak downward in the RPM range, as well as restoring the fatigue cycle life endurance.
- (e) Propeller must be marked "RECONDITIONED" with 3,175 mm (1/8 inch) high characters on the flat area of the front face of the hub boss. Indicate the second and subsequent repairs by a number stamped on the back face of the hub boss beginning with "2".
- (f) All the other conditions imposed by the various manufacturers remain unchanged.

(3) Fixed-pitch wooden propellers

- (a) Due to the nature of the wood itself, it is necessary that wooden propellers and blades be frequently inspected to assure continued airworthiness. Inspect for such defects as cracks, bruises, scars, warpage, evidence of glue failure and separated laminations, sections broken off and defects in the finish.
- (b) Irrespective of make, propellers of wooden construction must be removed and carefully inspected every 1 000 hours of operation or 5 years in service, whichever is the shorter, for conditions such as the following:
 - (i) elongated bolt holes;
 - (ii) out of track condition;
 - (iii) cracks in the shaft hole, bot holes or blades;
 - (iv) oversize shaft hole;
 - (v) broken lag screws that attach the metal leading edge sleeve to the blade;
 - (vi) separated laminations;
 - (vii) cracked internal laminations;
 - (viii) split blades;
 - (ix) cracks or deep cuts across the grain of the wood;
 - (x) loose lag screws or rivets;
 - (xi) appreciable warp of blades;
 - (xii) appreciable portion of wood missing;
 - (xiii) damaged hub flanges caused by over-tightening (the recommended torque values usually range from 2,073 to 3,318 kg/m (15 to 24 foot-pounds).
- (c) The propellers must be re-varnished and the balance checked and corrected.
- (d) Propeller tip drain holes must be opened.
- (e) Any repairs required must be carried out in accordance with the provisions of FAA document AC43-13-1B, or as the manufacturers prescribe.
- (f) Refer doubtful cases to the manufacturer and report such cases to the Director.

Annex A

INSPECTION REMINDER

<u>Aircraft registration mark:</u>	-	
<u>Next inspection due on:</u>	<u>(Date:)</u> _____ <u>or</u>	<u>(Hours:)</u>

Annex B1

CERTIFICATE OF RELEASE TO SERVICE

FOR AEROPLANES NOT EXCEEDING MCM OF 5 700KG

OR

HELICOPTERS NOT EXCEEDING MCM OF 3 175KG

OR

GLIDERS

OR

MANNED BALLOONS

<u>AMO Number</u>			
<u>Certificate Number</u>			
<u>Nationality and registration marks</u>			
<u>Aircraft type</u>			
<u>Aircraft serial number</u>			
<p>I hereby certify that I am satisfied that the above-mentioned aircraft and all its equipment are in every way serviceable for flight and that all maintenance has been carried out in accordance with the Civil Aviation Regulations, 2011, and the aircraft's Approved Maintenance Programme.</p>			
<u>This certificate lapses at a total of</u>		<u>Hours flight time on</u>	<u>(Date)</u>
<u>SIGNATURE OF AIRCRAFT MAINTENANCE ENGINEER</u>	<u>NAME IN BLOCK LETTERS</u>	<u>DATE OF ISSUE</u>	
<u>IDENTIFICATION STAMP</u>		<u>TIME OF ISSUE</u>	

Annex B2

FOR AEROPLANES ABOVE 5 700KG AND HELICOPTERS ABOVE 3 175KG

<u>Nationality and registration marks</u>			
<u>Aircraft type</u>		<u>Aircraft Serial No</u>	
<u>Total Aircraft Hrs</u>		<u>Total cycles</u>	
<u>CATEGORY "W"</u> <u>ELECTRICAL</u>	I hereby certify that I am satisfied that all electrical equipment and related systems are in every way safe for flight and that all maintenance has been carried out in accordance with the Civil Aviation Regulations, 2011, and its approved maintenance programme	<u>TIME</u> <u>DATE</u>	<u>SIGNATURE</u> <u>APPROVAL NO</u>
<u>CATEGORY "W"</u> <u>INSTRUMENTS</u>	I hereby certify that I am satisfied that all instruments and related systems are in every way safe for flight and that all maintenance has been carried out in accordance with the Civil Aviation Regulations, 2011, and its approved maintenance programme	<u>TIME</u> <u>DATE</u>	<u>SIGNATURE</u> <u>APPROVAL NO</u>
<u>CATEGORY "W"</u> <u>RADIO</u>	I hereby certify that I am satisfied that all radio equipment and related systems are in every way safe for flight and that all maintenance has been carried out in accordance with the Civil Aviation Regulations, 2011, and its approved maintenance programme	<u>TIME</u> <u>DATE</u>	<u>SIGNATURE</u> <u>APPROVAL NO</u>
<u>CATEGORY "C"</u> <u>ENGINES</u>	I hereby certify that I am satisfied that all engines and related systems are in every way safe for flight and that all maintenance has been carried out in accordance with the Civil Aviation Regulations, 2011, and its approved maintenance programme	<u>TIME</u> <u>DATE</u>	<u>SIGNATURE</u> <u>APPROVAL NO</u>
<u>CATEGORY "A"</u> <u>AIRCRAFT</u>	I hereby certify that I am satisfied that the above aircraft and related systems are in every way safe for flight and that all maintenance has been carried out in accordance with the Civil Aviation Regulations, 2011, and its approved maintenance programme <i>NOTE: This last item must not be signed as finally releasing the aircraft until all the above items have been signed.</i>	<u>TIME</u> <u>DATE</u>	<u>SIGNATURE</u> <u>APPROVAL NO</u>
<u>This certificate lapses at a total of</u>		<u>Hours of flight time when check</u>	
<u>Will be due on or</u>		<u>Whichever comes first unless the</u>	
Aircraft is involved in an accident or becomes unserviceable, in which case the certificate is invalid for the duration of the period.			
<u>FOR EXTENSION ONLY</u>			
<u>Extension issued for</u>		<u>Hours as authorised by the Approved Maintenance Programme</u>	
<u>This Certificate will now lapse at a total of</u>		<u>Airframe hours</u>	
<u>When check</u>		<u>Will be carried out</u>	

<u>SIGNATURE OF APPROPRIATELY CERTIFICATE PERSON</u>	<u>NAME IN BLOCK LETTERS</u>	<u>TIME AND DATE</u>
<u>IDENTIFICATION STAMP</u>		

Annex C

CERTIFICATE RELATING TO MAINTENANCE

<u>AMO Number</u>		
<u>Certificate Number</u>		
<u>Nationality and registration marks</u>		
<u>Aircraft type</u>	<u>e.g. Cessna 150</u>	
<u>Aircraft serial number</u>	<u>e.g. 55555</u>	
<u>Engine type</u>		
<u>Engine serial number</u>		
<u>Propeller type</u>		
<u>Propeller serial number</u>		
<u>Component type</u>		
<u>Component serial number</u>		
<u>Maintenance description (for detailed maintenance make reference to a document #)</u>		

I hereby certify that in carrying out the foregoing specified maintenance, all the requirements prescribed in the Civil Aviation Regulations, 2011, or appropriate authority which are applicable hereto, have been complied with.		
<u>SIGNATURE OF AIRCRAFT MAINTENANCE ENGINEER/ ORGANISATION</u>	<u>LICENCE OR OTHER APPROVAL NUMBER</u>	<u>DATE OF ISSUE</u>

Annex D

AUTHORISED RELEASE CERTIFICATE OF AN AIRCRAFT PART OR COMPONENT

1. <i>SOUTH AFRICAN</i>  CIVIL AVIATION AUTHORITY	2. <h2 style="margin: 0;">AUTHORISED RELEASE CERTIFICATE</h2> <p style="margin: 0;">CA 21- 19 AIRWORTHINESS APPROVAL TAG</p>	3. Form Tracking Number				
4. Organization Name and Address:		5. Work Order/Contract/Invoice Number:				
6. Item:	7. Description:	8. Part Number:	9. Eligibility : *	10. Quantity:	11. Serial/Batch Number:	12. Status/Work:
13. Remarks:						
14. Certifies the items identified above were manufactured in conformity to: <input type="checkbox"/> Approved design data and are in condition for safe operation. <input type="checkbox"/> Non-approved data specified in block 13.				19. <input type="checkbox"/> Part 43 Release to Service <input type="checkbox"/> Other regulation specified in block 13 Certifies that unless otherwise specified in Block 13, and the work identified in Block 12 and described in Block 13 was accomplished in accordance with Civil aviation Regulations, part 43 and in respect to that work, the items are approved for return to service.		
15. Authorised Signature	16. Approval/Authorization No.	20. Authorized Signature	21. Certificate/Approval Ref No.			
17. Name	18. Date: (YY/MM/DD)	22. Name	Date: (YY/MM/DD)			
User /Installer Responsibilities						
<p>It is important to understand that the existence of this document alone does not automatically constitute authority to install the part/component/assembly.</p> <p>Where the user/ installer performs work in accordance with the national regulations of an airworthiness authority different than the airworthiness authority of the country specified in Block 1, it is essential that the user/ installer ensures that his/her airworthiness authority accepts parts/components/assemblies from the airworthiness authority of the country specified in Block 1.</p> <p>Statements in Block 14 and 19 do not constitute installation certificate. In all cases, aircraft maintenance records must contain an installation certification issued in accordance with the national regulations by the user/installer before the aircraft may be flown.</p>						

Amendment of heading to Technical Standard 61.01.5

3. The following heading is hereby substituted for the heading to technical standard 61.01.5:

“[Maintenance of competency and skills test] Skills test, competency check and revalidation check”.

Insertion of Technical Standard 61.02.7

4. The following Technical standard is hereby inserted in Document SA-CATS 61:

“61.02.7 DISCONTINUANCE OF FLIGHT TRAINING

1. Failure to be recommended for solo flight after 30 hours (Aeroplane) or 40 hours (Helicopter) of dual flight training

- (1) A student pilot who fails to be recommended for solo flight after completing 30 (A) hours or 40 (H) hours of dual flight training, shall undergo a flight assessment by the CFI of the ATO where he or she is receiving flight training.
- (2) If the CFI cannot recommend solo flight for the student, then the following shall apply:
- (a) The student pilot shall be informed in writing that a potential safety risk has been identified and that CAR 61.02.7 may be brought into effect. The student shall acknowledge receipt of the letter.
- (b) A training program of up to 5 hours dual flight instruction shall be designed and implemented to address the knowledge, skills and attitude of the student pilot.
- (c) Once the additional 5 hours of dual flight instruction are flown (35 (A) or 45 (H)), a recommendation must be made by the responsible flight instructor for solo flight. If a recommendation cannot be made then the student must be referred for assessment by a DFE appointed for this purpose by the Director.

2. Failure to be recommended for solo flight after 35 hours (A) or 45 hours (H) of dual flight training

- (1) A student pilot who fails to be recommended for solo flight after completing 35 hours (A) or 45 hours (H) of dual flight training shall undergo a flight assessment by a DFE appointed for this purpose by the Director.
- (2) If the DFE cannot recommend solo flight for the student, then the following shall apply:

- (a) The student pilot shall be informed in writing that a potential safety risk has been identified and that CAR 61.02.7 may be brought into effect. The student shall acknowledge receipt of the letter.
- (b) A training program of up to 5 hours dual flight instruction shall be designed and implemented to address the knowledge, skills and attitude of the student pilot.
- (c) Once the additional 5 hours of dual flight instruction are flown (40 (A) or 50 (H)), a recommendation must be made by the responsible flight instructor for solo flight. If a recommendation cannot be made then the student must be referred for assessment by a DFE appointed for this purpose by the Director. This may not be the same DFE as appointed to carry out the assessment at 25 hours.

3. Failure to be recommended for solo flight after 40 hours (A) or 50 hours (H) of dual flight training

- (1) A student pilot who fails to be recommended for solo flight after completing 40 hours of dual flight training shall undergo a flight assessment by a DFE appointed for this purpose by the Director.
- (2) If the DFE cannot recommend solo flight for the student, then the following shall apply:
 - (a) The student pilot shall be informed in writing that a potential safety risk has been identified and that all further flight training is to be suspended whilst awaiting the decision of the Director in terms of CAR 61.02.7. The student shall acknowledge receipt of the letter.
 - (b) The CFI shall inform the Director that flight training has been temporarily suspended.
 - (c) The CFI shall compile a report for the Director containing copies of –
 - (i) the student pilot's training file;
 - (ii) the progress reports;
 - (iii) the written letters advising that flight training may be discontinued and acknowledgement of receipt of these letters by the student pilot;
 - (iv) the written letters advising that a potential safety risk has been identified and that all further flight training is to be suspended whilst awaiting the decision of the Director in terms of CAR 61.02.7. Acknowledgement of receipt of this letters by the student must also accompany the report.

4. Failure to make satisfactory progress after having flown solo

- (1) A student pilot assessed in terms of section 2(5) of technical standard 61.02.5 who fails to show satisfactory progress shall undergo a flight assessment by the CFI of the ATO where he or she is receiving flight training.

- (2) If the CFI cannot recommend solo flight for the student pilot, then the following shall apply:
- (a) The student pilot shall be informed in writing that a potential safety risk has been identified and that CAR 61.02.7 may be brought into effect.
 - (b) A training program of not more than 3 hours dual flight instruction shall be designed and implemented to address the knowledge, skills and attitude of the student.
 - (c) Once the additional 3 hours of dual flight instruction are flown a recommendation must be made by the responsible flight instructor for continued flight training. If a recommendation cannot be made then the student must be referred for assessment by a DFE appointed for this purpose by the Director.
- (3) At any point during flight training where the student pilot is assessed by the flight instructor to be a potential safety then the student pilot shall undergo a flight assessment by a DFE appointed for this purpose by the Director.
- (4) If the DFE cannot recommend continued flight training for the student pilot, then the following shall apply:
- (a) The student pilot shall be informed in writing that a potential safety risk has been identified and that CAR 61.02.7 may be brought into effect.
 - (b) A training program of not more than 3 hours dual flight instruction shall be designed and implemented to address the knowledge, skills and attitude of the student pilot.
 - (c) Once the additional 3 hours of dual flight instruction are flown a recommendation must be made by the responsible flight instructor for continued flight training. If a recommendation cannot be made then the student must be referred for assessment by a DFE appointed for this purpose by the Director.
- (5) A student pilot who fails to be recommended for continued flight training shall undergo a flight assessment by a DFE appointed for this purpose by the Director.
- (6) If the DFE cannot recommend continued flight training for the student, then the following shall apply:
- (a) The student pilot shall be informed in writing that a potential safety risk has been identified and that all further flight training is to be suspended whilst awaiting the decision of the Director in terms of CAR 61.02.7. The student shall acknowledge receipt of the letter.

- (b) The CFI shall inform the Director that flight training has been temporarily suspended.
- (c) The CFI shall compile a report for the Director containing copies of –
 - (i) the student pilot’s training file;
 - (ii) the progress reports;
 - (iii) the written letters advising that flight training may be discontinued and acknowledgement of receipt of these letters by the student pilot;
 - (iv) the written letters advising that a potential safety risk has been identified and that all further flight training is to be suspended whilst awaiting the decision of the Director in terms of CAR 61.02.7. Acknowledgement of receipt of this letters by the student must also accompany the report.

Substitution of Document SA-CATS 93

4. The following technical standard is hereby substituted for Document SA-CATS 93:

“SA-CATS 93: CORPORATE AVIATION OPERATIONS AND HIGH PERFORMANCE AIRCRAFT”

List of technical standards

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- 2. Maximum flight time
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- 4. General principles of control of flight, duty and rest time
- 5. Responsibilities of flight crew members
- 6. Standard provisions required for a flight time and duty period scheme
- 7. Limitations of single flight duty period – flight deck crew
- 8. Rest periods
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93.02.2 MINIMUM REQUIREMENTS FOR ASSIGNMENT AS PILOT-IN-COMMAND

1. Flight time experience

- (1) No person shall act as the pilot-in-command (PIC) of a passenger-carrying aircraft in accordance with CAR Part 93 unless –
 - (a) in the case of an aeroplane:
 - (i) on a IFR flight, the person has acquired at least 500 hours of flight time; and
 - (ii) on a day or night VFR flight, the person has acquired not less than 350 hours of flight time.
 - (b) in the case of a helicopter with a maximum certified take off mass > 2730 kg or a maximum certified seating configuration > 10 passengers:
 - (i) on a IFR flight, the person has acquired at least 1 200 hours of flight time; and
 - (ii) during the day or night VFR, the person has acquired at least 500 hours of flight time.
- (2) No person shall conduct single-pilot helicopter operations unless he or she –
 - (a) has met the recency requirements specified in CAR 91.02.4(1), (2) and (4) as the sole pilot of the helicopter;
 - (b) has successfully completed the relevant training, including passenger briefing with respect to emergency evacuation, autopilot management and the use of simplified in-flight documentation; and
 - (c) has successfully completed a PPC while acting as the sole pilot of the helicopter in an environment representative of the operation.

2. Operating experience

- (1) In addition to the requirements in section 3 of this Part –

- (a) A corporate aviation operator of an aircraft shall establish procedures to ensure a pilot is not assigned as the PIC following conversion to a new type of aircraft or upgrading to the PIC position on the same or a different aircraft unless adequate in-flight orientation and familiarization has taken place.
- (b) The procedures specified in subsection (1) shall include a line induction programme during which a PIC on a new type of aircraft or recently upgraded PIC shall, under the supervision of a PIC qualified to conduct line induction training and designated by the operator, acquire operational flight time comprised of a minimum number of sectors and/or hours of flight time. The minimum number of sector/flight hours shall be published in the operations manual.

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

- (c) A pilot shall not be authorised to operate as an unrestricted PIC until the operator is satisfied that such pilot is capable of operating safely without supervision and the pilot’s training records have been annotated accordingly.
- (d) Following the line induction programme, the operator shall consider mitigating the risks associated with low experience levels through the implementation of some or all of the following:
 - (i) limiting the authorised radius of action of the aircraft;
 - (ii) imposing higher route and aerodrome operating minima;
 - (iii) increased operational oversight;
 - (iv) ensure the ability to communicate with the operator as required;
 - (v) crew with an experienced second-in-command (for two crew operations);
or
 - (vi) additional line training.
- (e) The PIC, or responsible person, operating an aircraft mentioned in CAR 93.01.1 (1) (a) or (b), shall ensure that the PIC has undergone adequate in-flight orientation and familiarisation, following a conversion to a new type of aircraft or an upgrade to the PIC position.
- (f) In addition to paragraph (e) the PIC shall, under the supervision of a PIC qualified to conduct line induction training, acquire operational flight time comprised of a minimum number of sectors and/or hours of flight time.

93.02.14 FLIGHT TIME AND DUTY PERIOD SCHEME

Note – CAR 93.02.14 requires each operator, or PIC, to establish a scheme for the administration of flight time and duty periods. Operators and the PIC are reminded that they bear sole responsibility for such schemes being in full compliance with any Acts, Laws and

Regulations that are external to the South African Civil Aviation Regulations, notwithstanding any approvals given by the Director.

1. General

Time spent on flight watch or home reserve is deemed to be part of a rest period as provided in section 8(4)(e) of this technical standard.

2. Maximum flight time

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

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

(b) during the preceding seven days –

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

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

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

(c) during the preceding thirty days –

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

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

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

(d) 300 during the preceding 90 days; or

(e) 1000 hours during the preceding 365 days.

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

3. Approval of a flight time and duty period scheme

(1) A Corporate Aviation Operator shall submit a proposed scheme for the regulation of flight time and duty periods and minimum rest periods to the Director for approval.

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

- (3) With regards to operators operating under CAR 93.01.1 (1) (a) or (b), the scheme developed by the PIC or responsible person does not need to be approved by the Director. However, as per CAR 93.02.14 (2), the flight time and duty periods shall be retained and available for inspection on request by the Director.

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

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

- (a) individual duty and rest periods;
- (b) the length of cycles of duty and the associated periods of rest; and
- (c) cumulative duty hours within specific periods.

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

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

- (a) the need to construct consecutive work patterns which will avoid as far as possible such undesirable rostering practices as alternating day/night duties and the positioning of flight crews in a manner likely to result in a serious disruption of established sleep/work patterns;
- (b) the need, particularly where flights are carried out on a programmed basis, to allow a reasonable period for the pre-flight notification of duty to flight crews, other than those on standby duty; and
- (c) the need to plan time off and also to ensure that flight crews are notified of their allocation well in advance.

5. Responsibilities of flight crew members

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

6. Standard provisions required for a flight time and duty period scheme

- (1) The standard provisions which the Director regards as the basis for an acceptable scheme of flight time and duty limitations and which, if included in an operator's scheme, will facilitate approval by the Director are contained in sections 7 to 14 below.
- (2) Although corporate aviation operators, and the PIC or responsible person, are expected to plan their schemes in accordance with the requirements, it is however, recognised that the standard provisions will not necessarily be completely adaptable to every kind of operation. In exceptional circumstances therefore, operators may apply to have variations from the standard provisions included in their schemes. However, such variations should be kept to a minimum and approval, or exemption, will only be granted where an operator can show that these proposed provisions will ensure an equivalent level of protection against fatigue.

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

Note – The tables referred to in this section may be found in section 13 of this technical standard.

7.1 Maximum rostered flight duty periods

- (1) The maximum rostered FDP (in hours) shall be in accordance with Table 1, or Table 2 or 3, or Table 4 or 5 and with Table 6 for helicopter operations. Rostering limits in the tables may be extended by in-flight relief or split duty under the terms of sections 7.2 and 7.3. On the day, the PIC may at his or her discretion further extend the FDP actually worked in accordance with section 7.6.
- (2) Maximum FDP – Two pilot crews (Aeroplane only)

Table 2 applies when the FDP starts at a place where the flight crew member is acclimatised to local time and Table 3 applies to other times. To be considered acclimatised for the purpose of this technical standard, a flight crew member shall be allowed three consecutive local nights free of duty within a local time zone band which is two hours wide. He or she will thereafter be considered to remain acclimatised to that same time zone band until he or she ends a duty period at a place where local time falls outside this time zone band.

- (3) Maximum FDP – Two pilots plus additional flight crew member (Aeroplane only)

Table 4 applies when the FDP starts at a place where the flight crew member is acclimatised to local time, and Table 5 applies at other times. To be considered acclimatised for the purposes of this technical standard, a flight crew member shall

be allowed three consecutive local nights free of duty within a local time zone band which is two hours wide. He or she will thereafter be considered to remain acclimatised to that same time zone band until he or she ends a duty period at a place where local time falls outside this time zone band.

(4) Limits on two flight crew long range operations (Aeroplane only)

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

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

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

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

(5) Maximum FDP: Helicopters – refer to Section 13, Table 6.

7.2 Extension of flight duty period by in-flight relief

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

- (2) When in-flight relief is provided, there shall be available, for the flight crew member who is resting, a comfortable reclining seat or bunk separated and screened from the flight deck and passengers.
- (3) A total of in-flight rest of less than three hours will not count towards extension of an FDP, but where the total of in-flight rest (which need not be consecutive) is three hours or more, the rostered FDP may be extended beyond that permitted in Tables 2 and 3 or 4 and 5 by –
 - (a) if rest is taken in a bunk, a period equal to one half of the total of rest taken, provided that the maximum FDP permissible is 18 hours; and
 - (b) if rest is taken in a seat, a period equal to one third of the total of rest taken, provided that the maximum FDP permissible is 15 hours.
- (4) The maximum extension allowable is equivalent to that applying to the basic flight crew member with the least rest.
- (5) Where a flight crew member undertakes a period of in-flight relief and after its completion is wholly free of duty for the remainder of the flight, that part of the flight following completion of duty may be classed as positioning and be subject to the controls on positioning detailed in section 7.4.

7.3 Extension of flight duty period by split duty

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

<u>Consecutive hours rest</u>	<u>Maximum extension of the FDP</u>
<u>Less than 3 3 – 10</u>	<u>Nil</u> <u>Period equal to half of the consecutive hours rest taken</u>

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

7.4 Positioning

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

7.5 Travelling time

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

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

- (2) Where travelling time between the aerodrome and sleeping accommodation provided by the operator or responsible person, exceeds thirty minutes each way, the rest period shall be increased by the amount of the excess, or such lesser time as is consistent with a minimum of ten hours at the sleeping accommodation.
- (3) When flight crew members are required to travel from their home to an aerodrome other than the one from which they normally operate, the assumed travelling time from the normal aerodrome to the other aerodrome is classed as positioning and is subject to the controls of positioning detailed in section 7.4.

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

Note – It is important to note that the PIC discretion shall take into consideration whether or not a “. . . crew member is suffering from or, having regard to the circumstances of the flight to be undertaken, is likely to suffer from fatigue which may endanger the safety of the aircraft or its flight crew members and passengers . . .” as specified in CAR 93.02.14 (3)(b).

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

- (2) Whenever a PIC, operating for a Corporate Aviation Operator, exercises his or her discretion, he or she shall report it to the operator. This report shall be retained for inspection purposes.
- (3) Should a PIC, operating in accordance with CAR 93.01.1 (1) (a) or (b), exercise his or her discretion, a report shall be retained within the flight and duty scheme records, referred to in CAR 93.02.14 (2).
- (4) Should the maximum normally permitted be exceeded by more than two hours, both the PIC and, where applicable the corporate aviation operator, shall submit a written PIC's discretion report – extension of flight duty period, to the Director within thirty days.

Notes –

1. Discretion reports either concerning extension of a FDP in excess of two hours or reduction of a rest period shall be submitted to the Director. Those reports will be used by the Director when assessing the realism of particular schedules. The information required to be submitted and an example of the form may be obtained from the SACAA.
2. An emergency in respect of an extension of a FDP is a situation which in the judgment of the PIC presents serious risk to health or safety.

7.7 Delayed reporting time

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

7.8 Additional limits applicable to helicopter flying

Pilots engaged in repetitive short flights, with an average of ten or more take-offs and landings per hour shall have a break of at least thirty minutes away from the helicopter within any continuous period of three hours.

8. Rest periods

- (1) The Corporate Aviation Operator or responsible person shall, where practicable, notify flight crew members of a FDP and not schedule them for duty other than flight watch or home reserve, so that adequate and, within reason, uninterrupted pre-flight

rest can be obtained by the flight crew before the commencement of the next flight duty period. Away from base the Corporate Aviation Operator, or responsible person, shall provide the opportunity and facilities for the flight crew to obtain adequate pre-flight rest.

- (2) The Corporate Aviation Operator is responsible to ensure that rest accommodation is satisfactory. When operations are carried out at such short notice that it is impracticable for the operator to ensure that rest accommodation is satisfactory, it will be the PIC's responsibility to obtain satisfactory accommodation.
- (3) The PIC of an aircraft operated in accordance with CAR 93.01.1 (1) (a) or (b) shall be responsible to ensure the rest accommodation is satisfactory for all flight crew members.
- (4) The following rest period requirements shall be followed –
 - (a) each flight duty period, as well as flight watch and home reserve, shall be preceded by a rest period of at least –
 - (i) nine consecutive hours including a local night;
 - (ii) ten consecutive hours; or
 - (iii) if the preceding FDP, adjusted for split duty, exceeds eleven hours, an additional rest period shall be provided for in the flight time and duty period scheme to the satisfaction of the Director;
 - (b) where a flight crew member has completed two consecutive flight duty periods, the aggregate of which exceeds eight hours flight time or eleven hours flight duty time (extensions by in-flight relief or split-duty disregarded), and the intervening rest period has been less than twelve consecutive hours embracing the hours between 22h00 and 06h00 local time, he or she shall have a rest period of at least twelve consecutive hours embracing the hours between 22h00 and 06h00 local time or so much longer as to embrace these hours prior to commencing any further duties, but not necessarily longer than twenty-four consecutive hours; provided that this requirement does not apply in respect of consecutive flight watch and home reserve duties;
 - (c) following fifty hours (helicopters: sixty hours) of duty of any nature associated with his or her employment, except flight watch and home reserve duty, a flight crew member shall have a rest period of not less than twenty-four consecutive hours before commencing further duties;
 - (d) when a flight crew member has completed a FDP in excess of eighteen hours, he or she shall receive a rest period of at least eighteen hours including a local night before he or she commences any further duties; and

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

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

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

(b) If a rest period is reduced, the PIC shall submit a report to the Corporate Aviation Operator, where applicable. Alternatively the report shall be retained within the flight and duty scheme records, referred to in CAR 93.02.14 (2).

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

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

9. Duty periods

(1) The following limits apply –

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

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

** However, the provisions of section 7.4 apply.

- (2) For the purpose of calculating duty time, the following applies –
- (a) for the calculation of accumulated duty time in terms of section 11, flight watch and home reserve is credited on the basis of eight hours for every period of twenty-four or fewer consecutive hours or on a one-for-one basis, whichever is the lesser;
 - (b) standby duty time shall count fully as duty time for the calculation of accumulated duty time in terms of sections 8(4)(c) and (d) and 11; and
 - (c) see section 7.4 in respect of positioning time.

10. Days off

- (1) Flight crew members shall –
- (a) not work more than seven consecutive days between days off; and
 - (b) have two consecutive days off in any consecutive fourteen days; and
 - (c) have a minimum of six days off in any consecutive four weeks at the aerodrome from which they normally operate; and
 - (d) have an average of at least eight days off in each consecutive four week period, averaged over three such periods.

11. Cumulative duty hours

- (1) For aeroplanes:

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

- (2) For helicopters:

The average weekly total of duty hours may not exceed seventy hours over seven days, or sixty hours averaged over any two consecutive weeks. All types of duty, flight duty, ground duty, split duty, stand-by and positioning is counted in full for this

purpose. Any period of seven or more consecutive days within which the flight crew member is employed on duty other than flight duty, flight watch or home reserve, standby or positioning is not included in calculating the above average weekly total of duty hours.

12. Cabin crew members

For cabin crew member FDP requirements, refer to SA-CATS 121.02.13 (12).

13. Tables

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

<u>Local time of start</u>	<u>Up to 4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8 or more</u>
	<u>0500 – 0659</u>	<u>10</u>	<u>9¼</u>	<u>8½</u>	<u>8</u>
<u>0700 – 1359</u>	<u>11</u>	<u>10¼</u>	<u>9½</u>	<u>8¾</u>	<u>8</u>
<u>1400 – 2059</u>	<u>10</u>	<u>9¼</u>	<u>8½</u>	<u>8</u>	<u>8</u>
<u>2100 – 0459</u>	<u>9</u>	<u>8¼</u>	<u>8</u>	<u>8</u>	<u>8</u>

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

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

	<u>Sectors</u>
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<u>Local time of start</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8 or more</u>
<u>0500 – 0659</u>	13	12¼	11½	10¾	10	9¼	9	9
<u>0700 – 1359</u>	14	13¼	12½	11¾	11	10¼	9½	9
<u>1400 – 2059</u>	13	12¼	11½	10¾	10	9¼	9	9
<u>2100 – 0459</u>	12	11¼	10½	9¾	9	9	9	9
<u>2200 – 0459</u>	11	10¼	9½	9	9	9	9	9

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

<u>Length of preceding rest (hours)</u>	<u>Sectors</u>							
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7 or more</u>	
<u>Up to 18 or over 30</u>	13	12¼	11½	10¾	10	9¼	9	
<u>Between 18 and 30</u>	12	11¼	10½	9¾	9	9	9	

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

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

<u>Local time of start</u>	<u>Sectors</u>							
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8 or more</u>
<u>0500 – 0659</u>	<u>13</u>	<u>12¼</u>	<u>11½</u>	<u>10¾</u>	<u>10</u>	<u>9¼</u>	<u>9</u>	<u>9</u>
<u>0700 – 1359</u>	<u>14</u>	<u>13¼</u>	<u>12½</u>	<u>11¾</u>	<u>11</u>	<u>10¼</u>	<u>9½</u>	<u>9</u>
<u>1400 – 2059</u>	<u>13</u>	<u>12¼</u>	<u>11½</u>	<u>10¾</u>	<u>10</u>	<u>9¼</u>	<u>9</u>	<u>9</u>
<u>2100 – 2159</u>	<u>12</u>	<u>11¼</u>	<u>10½</u>	<u>9¾</u>	<u>9</u>	<u>9</u>	<u>9</u>	<u>9</u>
<u>2200 – 0459</u>	<u>11</u>	<u>10¼</u>	<u>9½</u>	<u>9</u>	<u>9</u>	<u>9</u>	<u>9</u>	<u>9</u>

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

<u>Length of preceding rest (hours)</u>	<u>Sectors</u>						
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7 or more</u>
<u>Up to 18 or over 30</u>	<u>13</u>	<u>12¼</u>	<u>11½</u>	<u>10¾</u>	<u>10</u>	<u>9¼</u>	<u>9</u>
<u>Between 18 and 30</u>	<u>12</u>	<u>11¼</u>	<u>10½</u>	<u>9¾</u>	<u>9</u>	<u>9</u>	<u>9</u>

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

Table 6: Maximum flight duty period and flight times: Helicopters

<u>Local time of start</u>	<u>Single pilot</u>		<u>Two pilots</u>	
	<u>Maximum length of flight duty period</u>	<u>Maximum flight time</u>	<u>Maximum length of flight duty period</u>	<u>Maximum flight time</u>
<u>0600 – 1759</u>	<u>10</u>	<u>7</u>	<u>12</u>	<u>8</u>
<u>1800 – 0559</u>	<u>9</u>	<u>6</u>	<u>12</u>	<u>7</u>

14. Flight operations officer or flight follower maximum duty and rest periods

- (1) A Corporate Aviation Operator’s flight time and duty period scheme shall include the requirements detailed in this section applicable to all flight operations officers and flight followers.
- (2) The flight time and duty period scheme shall comply with technical standard 121.02.13(13).

15. Records to be maintained

- (1) A Corporate Aviation Operator shall retain flight crew member flight time and duty period records as provided in CAR 93.04.5.
- (2) An operator shall retain all PIC discretion reports of extended flight duty periods and reduced rest periods for a period of at least six months.
- (3) A flight crew member, operating in accordance with CAR 93.01.1 (1) (a) or (b), shall retain flight time and duty records as provided in CAR 93.02.14 (2), for a period of at least 90 days. These records shall include PIC discretion reports of extended flight duty periods and reduced rest periods.

93.02.15 Fatigue Risk Management System (CAOC holders only)

Under development

93.03.1 TRAINING AND CHECKING PROGRAM

1. Applicability of training

(1) For the purposes of this section –

“the Corporate Aviation Operator” means the operator employing a pilot whose training was conducted by another operator; and

“the other operator” means the operator who conducted the training on the pilot.

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

(3) The initial and recurrent ground training requirements specified in CAR Part 93 Subpart 3 for a pilot on an aeroplane type certificated for a maximum mass of 5700 kg or less and helicopter type certificated for a maximum mass of 3180kg or less shall be deemed to be completed by the operator if completed as part of another South African operator’s approved training program: Provided that the other operator operates the same aircraft type and –

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

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

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

(4) The initial and recurrent flight training requirements specified in CAR Subpart 3 for a pilot on an aeroplane type certificated for a maximum mass of 5 700 kg and helicopter type certificated for a maximum mass of 3180 kg or less shall be deemed to be completed by the operator if completed as part of another South African

operator's approved training program: Provided that such training included at least the number of flight hours as that approved for the operator and, prior to conducting a commercial air transport operation, –

- (a) the corporate aviation operator or responsible person ensures such pilot receives flight training on any differences that may exist between the operator's model of aircraft and that on which the original training took place, including, at least, safety equipment, systems, engine or airframe, performance and operating characteristics differences;
- (b) the corporate aviation operator or responsible person ensures such pilot receives flight training in the use of any equipment installed in its aircraft that was not installed in the other operator's aircraft on which the training took place, such as navigational aids, auto flight system, flight director or FMS, ACAS, TAWS, weather radar, etc., in each aircraft he or she is to fly or an approved flight simulation training device (FSTD); and
- (c) the corporate aviation operator ensures such pilot receives flight training and becomes proficient in the use of the operator's SOPs in each aircraft he or she is to fly or an approved full flight simulator (FFS) of the type to be flown.

Notes –

- 1. An operator may not have to complete the training on each aircraft type if training credits have been approved as provided in sub-subsection 2.5.1 of TS 93.03.3.
 - 2. In the event additional training is required as a result of this technical standard, the operator shall conduct a proficiency check on the pilot following such training to ensure the pilot is familiar with any aircraft differences and is competent in the use of all aircraft equipment and the operator's SOPs.
- (5) The Corporate Aviation Operator accepting the training of another operator shall maintain on its training file for such pilot, detailed records of the other operator's and its own training, including at least –
- (a) the name of the organisation conducting the training, if other than the operator;
 - (b) the name of the person having conducted the training and, in the case of flight training, his or her licence number;
 - (c) the location where the training was completed;
 - (d) the date the training was completed;

- (e) the type, model and registration of the aircraft on which the flight training or any proficiency check was completed;
 - (f) copies of ground examinations or other approved means of demonstrating adequate knowledge of the aircraft and its equipment;
 - (g) copies of any proficiency checks completed on the pilot; and
 - (h) verification by the operator that the training was successfully completed.
- (6) The operator shall publish procedures in its operations manual to ensure that for each case in which another operator's training is to be accepted, the operator has –
- (a) identified what differences exist, if any, between its aircraft and those used by the other operator for the training and that such differences have been incorporated into its training program; and
 - (b) determined whether or not the SOPs used for the other operator's training are the same as those used by the operator.

2. Equipment, facilities and personnel of a training program

- (1) A Corporate Aviation Operator shall ensure that its training equipment and facilities and personnel are adequate for their intended purpose.
- (a) Equipment – While no specific standards are published for the training equipment used as teaching aids, a benchmark is whether or not the information being presented is done so through the use of adequate training aids so as to make the material understandable to the trainee. Equipment will be assessed against state of the art training aids with reasonable consideration given to the scope and size of the operator.
 - (b) Facilities – Training facilities, like equipment, are assessed for their suitability by a comparison with state of the art training facilities giving due consideration to the scope and size of the operator. Facilities normally must be such that the trainee will not be distracted from the course material or training aids being displayed and provide an environment conducive to learning. Control over lighting, noise, temperature, location, orientation and general comfort of learning stations and where needed, sound enhancement or amplification must be favourable to a learning environment.

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

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

3. Use of FSTD's for training and checking

3.1 Aeroplanes

- (1) It is anticipated that in the delivery of its flight training program an operator will make every reasonable effort to use the most updated FSTDs where such are available to the operator.
- (2) Except as provided in subsections (4) and (5), the use of a full flight simulator (FFS) of the type to be flown is mandatory for initial and recurrent training and checking on aircraft of a maximum certificated mass (MCM) exceeding 15 000kg for the following exercises –
- (a) engine failure at V1*;
 - (b) low and high speed rejected take-offs;
 - (c) low visibility operations (LVTO, CAT II/III), if applicable*;
 - (d) asymmetric flap and spoiler deployments;
 - (e) uncommanded/runaway flap and spoiler deployments;
 - (f) jammed or inoperative pitch trim (occurring at both high and low speed);
 - (g) jammed or inoperative primary flight controls;
 - (h) upset attitude recovery;
 - (i) uncommanded/runaway auto-flight system control inputs (pitch, roll and yaw);
 - (j) erroneous pitot-static and gyro instrument indications;
 - (k) ACAS TA's/RA's*;
 - (l) TAWS events*;
 - (m) windshear on final approach and after take-off*;
 - (n) turbulence penetration and updraft/downdraft;
 - (o) hydraulic failures (effects on controls, etc.);
 - (p) engine fire;
 - (q) electrical failures (effects on systems);
 - (r) APU fire;
 - (s) electrical fire;
 - (t) wheel well fire;
 - (u) smoke in the cockpit;
 - (v) asymmetric flaps (zero flaps for some aeroplanes);
 - (w) maximum crosswind during T/O, landing and approaches*; and
 - (x) take-off over/under rotation.

Notes –

1. All exercises shall be completed to a satisfactory level during an initial training course.

2. Exercises with an asterisk shall be satisfactorily demonstrated at least every twelve months.
 3. Exercises without an asterisk shall be satisfactorily demonstrated at least every 24 months.
 4. An operator approved for aircraft grouping as provided in technical standard section 2.5.1 of technical standard 93.03.3 shall alternate the training between the aircraft within the group.
- (3) The remainder of the training and checking program may be accomplished in the aircraft.
 - (4) The Director may require a FFS to be used as part or all of the training program of any aeroplane type or variant where such aeroplane is unusually complex by design or in flying characteristics as compared to an aeroplane of a similar MCM, such that training to address the specific unusual design and/or flying characteristic of the aeroplane cannot properly and safely be carried out without using a FFS.
 - (5) The Director may permit aeroplane-only training: Provided –
 - (a) there is no suitable simulator available anywhere;
 - (b) the FFS is, by virtue of its certification or serviceability, restricted in its training and checking credits; or
 - (c) the operator or ATO requests an exemption based upon exceptional circumstances.
 - (6) Reference to a FFS in this technical standard means a FFS of a level required to accomplish the training program approved for the operator.

3.2 Helicopters

- (1) It is anticipated that in the delivery of its flight training program, an operator will make every reasonable effort to use the most updated Flight Simulation Training Devices (FSTDs) where such FSTD is available to the operator.
- (2) In the case of flight training for which there is in service a FFS, the helicopter-specific training shall be completed in a FFS approved for that purpose.
- (3) Reference to a FFS in this regulation means a FFS of a level required to accomplish the training program approved for the operator.
- (4) Where an operator has been approved for Low Visibility Operations (LVO) all

training and checking with respect to LVO shall be performed in a FFS approved for that purpose.

4. Qualifications of training and checking personnel

Notes –

1. Unless otherwise specified, reference to an aircraft type shall be taken to mean type or variant of that type of aircraft where applicable.
2. Other than regaining qualification training as noted, reference to training and or checking shall be taken to mean initial, upgrade, recurrent or differences training.

(1) Qualifications of all training personnel

- (a) An operator shall select its training personnel based on them having a satisfactory practical and theoretical knowledge of –
 - (i) the subject the instructor is to teach;
 - (ii) the aircraft type the instructor is to teach on, if applicable;
 - (iii) the basic principles of learning and techniques of instruction;
 - (iv) preparation and use of lesson plans;
 - (v) the administrative procedures with respect to the established trainee progress forms;
 - (vi) briefing and debriefing techniques relative to the training given;
 - (vii) all associated training devices including applicable FSTDs to be used, if applicable; and
 - (viii) the procedures established in the training program for the administration, conduct, review and correction of, as applicable –
 - (aa) required examinations or other approved methods of establishing comprehension; and
 - (bb) skills tests, proficiency or other competency checks.

(2) Qualifications of a ground instructor

- (a) Each ground training instructor shall have met the requirements of section

4(1) of this TS and –

- (i) unless he or she is or has been the holder of an instructor rating as provided in these Regulations, have received training on –
 - (aa) the fundamental principles of the teaching/learning process;
 - (bb) teaching methods and procedures;
 - (cc) the instructor/student relationship;
 - (dd) learning impediments;
 - (ee) human factors relating to the effects of stress and hazardous attitudes;
 - (ff) the objectives and standards of the operator's training program;
 - (gg) the effective use of training devices used in the program;
 - (hh) CAR and CATS relating to training requirements; and
- (ii) the system of record keeping approved to be used in conjunction with the training program; and
- (iii) if conducting aircraft type training, have successfully completed the initial and recurrent technical training and testing as applicable for each type of aircraft or have received training in, or have experience with, the aircraft system or systems to be taught;
- (iv) if conducting aircraft type training, have a sound knowledge of the SOPs or AOM, as applicable, AFM, manuals for special equipment training and the operator's operations and training manuals, as applicable;
- (v) if conducting training relating to special operations or non-aircraft specific courses, shall have completed the associated training and testing and be certified by the person responsible for training as competent to teach such subject(s); and
- (vi) where the type of training includes interfacing with other crew members, an appropriate level of knowledge of the functional manuals assigned to such other crew members.

(3) Qualifications of a flight training pilot

- (a) Each flight training pilot who is to conduct training in the aircraft or both the aircraft and a FSTD shall have met the requirements of section 4(1) above of this TS and –
- (i) hold the following licences, ratings and certificates –
 - (aa) a valid flight instructor rating;
 - (bb) a valid medical certificate; and
 - (cc) for aeroplanes with an MCM of greater than 5 700kg and helicopters with an MCM of greater than 3180kg, a valid ATPL and a type rating for the type of aircraft on which training will be given; or
 - (dd) for aeroplanes with an MCM of greater than 5 700kg and helicopters with an MCM of greater than 3180kg, a valid CPL and
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 - (A) if the aircraft training includes instrument flight training, a valid instrument rating; and
 - (B) a type rating for the type of aircraft on which training will be given, if applicable;
 - (ii) be currently qualified for line or operational flying on the type of aircraft;
 - (iii) be qualified to perform PF and PNF duties while occupying either flight crew member seat;
 - (iv) know the content of the AFM, SOPs or AOM, if applicable, special equipment manuals, as appropriate, operator's operations and training manuals as applicable to the aircraft type; and
 - (v) know the relevant provisions of the South African and where international operations are involved, the foreign regulations.
- (b) Each flight training pilot who is to conduct training only in a FSTD shall meet the requirements prescribed in subsection (3)(a) of this section, with the exception of sub-paragraph (a)(i)(bb), in which case he or she shall either hold or have held an ATPL, and the qualification prescribed in sub-paragraphs (a)(ii) and (iii), and, in addition –
- (i) have successfully completed the operator's ground and flight training program for the type of aircraft;

- (ii) have successfully completed within the past 12 months a PPC in the FFS or aircraft for that type;
- (iii) shall maintain familiarity with the operator's SOPs, in particular changes to the SOPs; and
- (iv) have received instruction from, and demonstrated the ability to operate the FSTD to a suitably qualified instructor.

(4) Qualifications of pilot checking personnel

(a) Each person authorised to conduct pilot PPCs shall –

- (i) in the case of a PPC conducted by a flight training pilot qualified on the aircraft or the aircraft and the FFS –
 - (aa) have met all the qualification requirements specified in sections 4(1) and 4(3)(a) of this TS;
 - (bb) for PPCs involving an initial issue or revalidation of an instrument rating or an initial issue of a multi-engine piston class rating or turbine rating, be the holder of a DFE authority issued by the Director appropriate to the aircraft in which such PPC is to be conducted and for all other PPCs, be an approved current Grade I or Grade II flight instructor qualified on that aircraft;
 - (cc) have been monitored in the preceding 12 months conducting a PPC, in at least one of the aircraft types for which the authority is being sought –
 - (A) For DFE's, by a SACAA inspector or, in exceptional circumstances, another DFE approved by the Director; and
 - (B) For flight instructors, by a DFE;
 - (dd) hold a valid medical certificate;
 - (ee) have completed the operator's training program and be qualified as a line captain; and
 - (ff) be qualified to perform PF and PNF duties while occupying either flight crew member seat;
- (ii) in the case of a PPC conducted by a FFS-only qualified flight training pilot, have met all the qualification requirements specified in sections

4(1), 4(3)(b) and 4(4)(a)(i) (with the exception of sub-paragraph (ee)) above;

- (iii) in the case of line checks –
 - (aa) have met the qualification requirements specified in sections 4(3)(a) and 4(4)(a)(i) of this TS;
 - (bb) have completed the operator's training program and be qualified as a line captain on the aircraft type on which the check will be given;
 - (cc) be qualified to perform PF and PNF duties while occupying either flight crew member seat; and
 - (dd) be authorised by the operator to conduct line checks as specified in such certification.

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

(5) Qualifications of Flight Operations Officer (FOO) instructors and examiners

- (a) an operator shall not assign any person to provide and no person shall provide any generic or operator-specific FOO training required in terms of Division Four of Subpart 3, unless such person:
 - (i) is the holder of a valid FOO certificate of competency issued in terms of Division Five of CAR Subpart 3;
 - (ii) has completed the FOO generic course of studies;
 - (iii) has completed the operator-specific FOO training for each type of operational control system and each aircraft type he or she will be required to perform training on; and
 - (iv) has successfully completed a proficiency check as specified in Division Five of CAR Subpart 3 in the preceding 12 months.
- (b) An operator shall not assign and no person shall act as a FOO examiner unless such person:
 - (i) is the holder of a current FOO certificate of competency appropriate to their assigned duties;
 - (ii) has completed the FOO training referred to in subparagraph (a) appropriate to their assigned duties.

- (iii) has successfully completed a proficiency check as specified in Division Five of CAR Subpart 3; and
- (iv) has been certified by the operator to act as a FOO examiner for those types of operational control systems and helicopters listed in the certification.

(6) Training for other than crew members and FOO

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

5. Training records

- (1) Every Corporate Aviation Operator shall, for each person who is required to receive training in terms of CAR Subpart 3, establish and maintain a record of –
 - (a) the person's name and, where applicable, licence number, type and ratings;
 - (b) if applicable, the person's medical category and the expiry date of that category;
 - (c) for pilots, the latest date any training for an initial type rating or for regaining qualification, as contemplated in section 2.5 of technical standard 93.03.3 was completed, whether or not such training was completed while in the employ of the operator.
 - (d) the dates on which the person, while in the operator's employ, successfully completed any training, proficiency check or examination required in terms of CAR Subpart 3 or obtained any qualification required in terms of this Part, Part 61 or Part 64, as applicable;
 - (e) information relating to any failure of the person, while in the operator's employ, to successfully complete any training, proficiency check or examination required in terms of CAR Subpart 3, or to obtain any qualification required in terms of Part 61, 63 or 64 or this TS; and
 - (f) the type of aircraft or flight training device used for any training, proficiency check, line check or qualification required under this technical standard.
- (2) An operator shall retain a copy of the most recent written examination completed by each person for each subject for which an examination is required.

93.03.2 APPROVAL OF TRAINING PROGRAMME

1. Approval process of a corporate aviation operator's training programme

- (1) The procedures contained in this TS have been established for the initial approval of a corporate aviation operator's training program or the introduction of new equipment. The subsequent approvals of training program amendments will normally be a one-phase process consisting of final approval.
- (2) Unless the training program is contained in the company operations manual, each operator shall submit two complete copies of its proposed training program along with a list of effective pages to the Director for review and approval.
- (3) Where in the opinion of the Director the proposed program has been presented in sufficient detail to enable him or her to make a preliminary evaluation and determine the program meets the requirements of these technical standards, an initial approval of the training program will be given. One copy of the program will be returned along with a copy of the list of effective pages which will bear an initial approval stamp. The corporate aviation operator is then authorised to present the program.
- (4) Where insufficient detail has been provided the Director may return the training program either in whole or in part for further development.
- (5) The initial approval referred to in subsection (3) will normally be given for an initial period of one year during which time the program will be monitored in sufficient depth to enable a final decision to be made with respect to the effectiveness of the program in terms of meeting the established training goals.
- (6) When the Director is satisfied that the training program meets the requirements of this technical standard, a final approval will be issued.
- (7) After the initial approval has been received but before the final approval has been issued, each corporate aviation operator is required to advise the Director within seven days of the intention to present the training program. Unless otherwise advised, the corporate aviation operator shall make accommodation for an inspector to attend.

2. Approval of contracted training services

- (1) A corporate aviation operator may contract any required training to another organisation provided –
 - (a) the arrangement is clearly provided for in the approved training program;
 - (b) the contracted training organisation is the holder of a valid ATO certificate issued in terms of Part 141 or has been otherwise issued approval to conduct

training by the Director;

- (c) the contracted training organisation uses the manuals and publications approved for use by the operator (Standard Operating Procedures (SOPs), Aircraft Flight Manual (AFM), Aircraft Operating Manual (AOM), if applicable, Operator's Operations Manual, including Training and Cabin Crew Member's Manual, etc.);
- (d) the operator ensures that the training is conducted in accordance with the approved programme;
- (e) where aircraft type training is conducted the training is provided on the same type and model aircraft operated by the operator unless appropriate differences training is provided and described in the approved training program; and
- (f) the operator remains responsible to ensure the training records approved in the operator's training program are completed by the contracted ATO and maintained in the trainee's file at the base of the operator.
- (g) the operator ensures that a service level agreement is in place with the contracted organization.

93.03.3 FLIGHT CREW MEMBER TRAINING

1. Definitions

For the purposes of this Technical Standard the following terms shall have the following meanings –

“**company/operator induction training**” means company-specific generic training covering a number of subjects as prescribed by regulation. Certain subjects may be presented only as a generic, introductory overview where an operator determines it would be more appropriate to provide amplified training in connection with a specific aircraft type or operational environment;

“**cabin safety, emergency equipment and security training**” means training given to an aircraft crew member to familiarise them with the location, inspection, testing and use of all emergency equipment required to be carried on board an aircraft and includes specific training required to ensure passenger safety;

“**crew resource management training**” means training including the principles of human factors designed to ensure the individual and collective efforts of all crew members on board an aircraft are co-ordinated for maximum effectiveness;

“differences training” means training required to ensure a flight crew member is proficient on similar aircraft types or variants having significant differences in terms of equipment, configuration or operation;

“emergency equipment procedures training” means training given to aircraft crew members to familiarise them with the location, inspection, testing and use of all emergency equipment required to be carried on board an aircraft and includes specific training required to ensure passenger safety;

“familiarisation training” means training required to ensure a flight crew member is proficient on similar aircraft types or variants having only minor differences in terms of equipment, configuration, or operation;

“initial training” means the training required for a pilot to obtain a new type rating;

“line/operational training” means training provided to a flight crew member in the form of approved supervised flying during line operations;

“regaining competency” means the training and where specified, the check required when a person exceeds the currency criteria of any qualification required by this Part and is designed to return such person to a satisfactory level of competence;

“sector” means a flight, including a take-off, an en route segment of at least 30 NM, and a landing;

“surface contamination training” means training in an operator’s procedures for removal of frozen contaminants from the critical surfaces of an aircraft, as established by the manufacture from the time, from the initial de-icing application to the point of last chance prior to the take-off;

“type training” means initial type training;

“upgrade training” means training provided to advance a flight crew member from one flight crew position to a higher flight crew position;

Note – Refer to the technical guidance material (TGM) for course content for all of the following training program elements.

2. Required training

2.1 Ground training course syllabi

CAR 93.03.1 requires a Corporate Aviation Operation to develop a detailed ground and flight training program. In order to properly assess a training program a detailed syllabus shall be published for each component making up the total program. The following program components shall contain the details of at least the following

subject areas. While the company induction would normally be the first course provided to a newly hire employee the sequence of the following curriculum is not necessarily intended to be sequential to the delivery of a corporate aviation operator's program.

2.2 Company induction

(1) Company induction is required only upon initial engagement for all flight crew members except where substantial changes in the company make it necessary to revise the course material. The program shall ensure that persons involved in flight operations are aware of their responsibilities, know company reporting relationships and are competent to fulfil their assigned duties related to flight operations. Company induction training shall include as applicable:

- (a) South African Civil Aviation Regulations and, where necessary, foreign regulations, and technical standards;
- (b) Corporate aviation operator certificate and operations specifications;
- (c) company organisation, reporting relationships, administration and communication procedures;
- (d) flight planning and operating procedures;
- (e) fuelling procedures including procedures for fuelling with passengers on board and fuel contamination precautions;
- (f) critical surface contamination where required, and safety management system;
- (g) passenger safety briefings and safe movement of passengers to/from the aircraft, as applicable;
- (h) use and status of company operations manual including the maintenance release procedures and accident/incident reporting procedures;
- (i) use of minimum equipment lists, if applicable;
- (j) windshear, aircraft icing and other meteorological training appropriate to the area of operations;
- (k) navigation procedures and other specialised operations applicable to the operator;
- (l) passenger on-board medical emergency;

- (m) handling of disabled passengers;
- (n) operational control systems;
- (o) mass and balance system procedures;
- (p) security and security awareness policies and procedures; and
- (q) pre-flight crew member briefing including confirmation as to the discrete alerting procedures for suspected security breaches.

2.3 Crew resource management training

- (1) A Corporate Aviation Operator or PIC shall ensure each flight crew member has received crew resource management (CRM) training including human factors, risk analysis and error and threat management training –
 - (a) upon initial appointment to the operator unless such person has, within the preceding 12 months, received CRM training from another approved training organisation. In such cases, the operator shall provide the flight crew member with training in those elements of CRM that are company-specific; and
 - (b) on a recurrent basis every 12 months thereafter.
- (2) CRM training shall include at least classroom lectures and practical exercises. The use of group discussions as forums to problem solving or accident reviews to analyse the human factors breakdown as possible contributing or causal factors contributes significantly to CRM training.
- (3) An operator may use a course provided by another operator, if that course has been approved by the Director and the training agreement between the operator and the service provider complies with the requirements as prescribed in TS 93.03.2(2)

2.4 Cabin safety, emergency equipment and security training

- (1) A Corporate Aviation Operator, responsible person or PIC shall ensure that each flight crew member receives training and checking on the location and use of all emergency and safety equipment carried on board the operator's aircraft and emergency evacuation training –
 - (a) upon initial employment by the operator and for each aircraft type to which the flight crew member is assigned that may employ different equipment or procedures unless such person has, within the preceding 12 months, received such training from another approved training source. In such cases, the operator shall provide the flight crew member with training in those elements of cabin safety, emergency equipment and security procedures that are company-specific; and

- (b) on a recurrent basis every 12 months thereafter, consisting of items from the initial program that may have changed since the last training session.
- (2) Training devices approved to simulate flight operating emergency conditions, static aircraft, ground demonstrations, classroom lectures where adequate visual aids are provided, films or other devices may be used for training: Provided the method used ensures that each crew member is adequately trained in the operation or use of all emergency equipment.
- (3) Each flight crew member shall be trained in the operator's security policies and procedures and, in particular, the procedures associated with hijacking, bomb threats and unlawful interference.
- (4) Where practical training is required, it shall be completed during initial training and every three years thereafter. This training should, where practicable, be provided either in whole or in part, as determined by the operator, as part of the CRM training scenario and involve both flight and cabin crew members, if applicable. Emergency equipment and procedures training shall include:

Note: This emergency procedures training does not in itself satisfy the training requirements relating to the emergency procedures laid down in the aircraft flight manual.

- (a) the location, inspection schedules, testing, as applicable, and use of all emergency equipment required to be carried, or otherwise carried on board the aircraft;
- (b) emergency evacuation and where applicable, ditching training;
- (c) training in the functions for which each flight crew member is responsible and the relation of these functions to the functions of other crew members, particularly in regard to abnormal or emergency procedures.
- (d) fire in the air and on the ground;
- (e) use of fire extinguishers, including practical training;
- (f) operation and use of emergency exits including practical training;
- (g) passenger preparation for an emergency landing or ditching, as applicable, including practical training;
- (h) emergency evacuation procedures including practical training;

- (i) donning and inflation of life preservers, when equipped, including practical training;
- (j) removal from stowage, deployment, inflation and boarding of life rafts/slide rafts, when equipped, including practical training;
- (k) pilot incapacitation including practical training;
- (l) hijacking, bomb threat and other security procedures which ensures crew members act in the most appropriate manner to minimise the consequences of acts of unlawful interference. As a minimum, this program shall include the following elements:
 - (i) determination of the seriousness of any occurrence;
 - (ii) crew communication and co-ordination including discrete communications and signals between the cabin and flight crew during flight time;
 - (iii) appropriate self-defence responses;
 - (iv) use of non-lethal protective devices assigned to crew members where such use is authorised by the Director;
 - (v) understanding of behaviour of terrorists so as to facilitate the ability of crew members to cope with hijacker behaviour and passenger responses;
 - (vi) live situational training exercises regarding various threat conditions;
 - (vii) flight deck procedures to protect the aircraft; and
 - (viii) aircraft search procedures and guidance on least-risk bomb locations where practicable;
- (m) passenger on-board medical emergency;
- (n) handling of unruly passengers; and
- (o) special emergency procedures when the aircraft is used on MEDEVAC operations including patient evacuation in emergency situations.

2.5 Aircraft type initial and recurrent ground and flight training

2.5.1 General

- (1) A Corporate Aviation Operator and the PIC of an aircraft operated in accordance with this technical standard, shall ensure that each flight crew member is provided with ground and flight training on each aircraft type to be flown as follows –
- (a) upon initial appointment of the flight crew member to an aircraft for which the flight crew member does not have that type rating or has a newly acquired type rating but no experience on that type; and
 - (b) on a recurrent basis every 12 months thereafter, unless otherwise approved by the Director based on training credits for similar aircraft types as provided in subsection (4) of this section.
- (2) A flight crew member joining a corporate operator with a type rating and experience on the aircraft to be operated with that operator, shall undergo the operator's recurrent ground and flight training program, including sufficient training to ensure he or she is familiar with the operator's aircraft and standard operating procedures. A proficiency check shall be completed following such training.

Note – For the purposes of this TS, a pilot is deemed to have “experience” if such pilot has accumulated at least 25 hours on the type of aircraft.

- (3) An operator need not administer a complete initial type training program to a pilot coming to the operator with a newly acquired type rating and no experience on that type: Provided –
- (a) the operator provides the following ground training to the pilot prior to conducting operations –
 - (i) in the event the operator's aircraft are different models than those upon which the pilot's ground training was based, the operator ensures such pilot receives additional training covering any differences between the models, including, at least, safety equipment, systems differences, engine/airframe limitations, performance considerations and operating characteristics;
 - (ii) in the event the operator's aircraft are equipped with different ancillary equipment than those upon which the pilot's ground training was based or not given, such as navigational aids, auto flight system, flight director/flight management system (FMS), airborne collision avoidance system (ACAS), terrain awareness and warning system (TAWS), weather radar, etc., the operator shall provide training on such equipment; and
 - (iii) the operator establishes that the pilot has adequate knowledge of the different models of aircraft and equipment noted in sub-paragraphs (i)

and (ii) above;

- (b) the operator provides the following flight training to the pilot prior to conducting operations –
- (i) flight training on any differences that may exist between the operator's model of aircraft and that on which the initial training took place, including, at least, systems, engine or airframe, performance and operating characteristics differences;
 - (ii) flight training in the use of any equipment installed in the operator's aircraft that was not installed in the aircraft on which the initial training took place, such as navigational aids, auto flight system, flight director or FMS, ACAS, TAWS, weather radar, etc., in the aircraft or an approved flight simulation training device (FSTD); and
 - (iii) sufficient flight training in the aircraft or an approved full flight simulator (FFS) of the type to be flown to ensure the pilot becomes proficient in the use of the operator's SOPs;

Notes –

- 1. *A Corporate Aviation Operator may not have to complete the training on each aircraft type if training credits have been approved as provided in subsection (4) of this section.*
 - 2. *In the event additional training is required as a result of this technical standard, the Operator shall conduct a proficiency check on the pilot following such training to ensure the pilot is familiar with any aircraft differences and is competent in the use of all aircraft equipment and the operator's SOPs.*
- (c) the operator shall maintain on its training file for each pilot arriving with a newly acquired type rating, detailed records of the initial training received and its own training, including at least –
- (i) the name of the organisation having conducted the training, if other than the operator;
 - (ii) the name of the person having conducted the training and, in the case of flight training, his or her licence number;
 - (iii) the location where the training was completed;
 - (iv) the date the training was completed;

- (v) the type, model and registration of the aeroplane on which the flight training or any proficiency check was completed;
 - (vi) copies of ground examinations or other approved means of demonstrating adequate knowledge of the aircraft and its equipment;
 - (vii) a copy of the pilot's type rating skills test; and
 - (viii) verification by the operator that the training was successfully completed;
- (d) the operator shall publish procedures in its operations manual to ensure that for each case in which a pilot claims credit for a newly acquired type rating, the operator has –
- (i) verified the veracity of the type rating endorsement;
 - (ii) identified what differences exist, if any, between its aircraft and those used for the initial training and that such differences have been incorporated into its training program; and
 - (iii) determined whether or not the SOPs used for the initial training are the same as those used by the operator; and
- (e) the pilot undergoes the full line/operational induction training program as specified in sections 3.1 and 3.2 of this TS.
- (4) A Corporate Aviation Operator may be permitted training credits for different types or variants of aircraft based on the demonstrated similarities between the aircraft, hereinafter referred to as "aircraft grouping". Notwithstanding approved aircraft grouping, the initial training shall be completed on each type of aircraft operated and the subsequent training shall be accomplished on a rotating basis between the aircraft involved. For the purposes of this TS and associated regulations, recurrent training completed on one aircraft type shall be deemed to have been completed on all aircraft types for which aircraft grouping has been approved.

Ground Training

2.5.2 Aeroplanes

- (1) Initial aircraft type ground training shall consist of a detailed program covering at least –
- (a) all of the aircraft's systems and their associated limitations, if any;
 - (b) the aircraft's normal, abnormal and emergency procedures;
 - (c) the mass and balance and performance data and calculations; and

- (d) the aircraft's emergency equipment.

Note – Initial ground training involving emergency equipment may be restricted to the identification of what equipment is on board the aircraft and its location. Emergency equipment use and practical demonstration requirements are covered under section 2.4.

- (2) Recurrent ground training shall consist of a review of such of the subjects outlined in an initial training program that would ensure critical information is reviewed timeously, including any changes to the aircraft or operating procedures that occurred since any previous training.
- (3) Comprehension examinations shall be administered and successfully completed by the trainee following any ground training and prior to advancing to the next phase of learning.

2.5.3 Helicopters

- (1) In developing a helicopter type training course an operator engaged in operations under Part 93 shall show the order in which any other training courses considered necessary in support of an initial helicopter type training course, will be presented. This is to ensure all related information is presented in the best chronological order to facilitate the learning process. In the same manner, comprehension examinations shall be administered and successfully completed by the trainee following any training and prior to advancing to the next phase of learning.
- (2) Subject to subsection (1), initial helicopter type technical training shall be provided as the first phase of an initial helicopter type course or variant of the same type of helicopter. This training shall provide an in-depth description of the design and function of all helicopter systems and major components sufficient to ensure each flight crew member is knowledgeable with respect to helicopter systems and related normal, abnormal, emergency and supplementary procedures. The following subjects shall be detailed in the helicopter type ground training syllabus:
- (a) each helicopter system contained in the helicopter aircraft flight manual and supplements thereto, including system limitations and alternate modes of operation;
- (b) operation of all equipment that is installed in all helicopters of the same type operated by the operator;
- (c) differences in equipment that is installed in all helicopters of the same type operated by the operator;
- (d) specific standard operating procedures for pilot flying and pilot monitoring duties for normal, abnormal and emergency procedures for the helicopter;

- (e) helicopter performance; and
 - (f) mass and balance procedures.
- (3) Recurrent ground training shall be conducted annually and shall be a review of the subjects outlined in paragraphs (2)(a) through (d) and an in-depth description of any changes to the helicopter or operating procedures that occurred since the previous course.

Flight Training

2.5.4 Aeroplanes

Note – *For the purposes of this TS, “zero flight time training” means that training on an actual aircraft is not required.*

- (1) The Corporate Aviation Operator shall specify the training syllabi and proposed training times in its operations manual.
- (2) Refer to TS 93.03.1(3)(a)&(b) for the requirements for mandatory FSTD use.
- (3) The training times allocated to initial and recurrent flight training shall not be less than –
 - (a) for initial flight training –

Notes –

- 1. The initial training times in the following table are based on a complete type-rating course as well as training required by these Regulations and may be reduced to not less than ½ of the minimum time based on pilot experience, subject to the Director’s prior approval.
- 2. Refer to subsection 2.5.1(3) of this TS for initial training requirements for a pilot who comes to the operator with a newly acquired type rating and no experience on that type.

	<u>Flight Training (PF Hours) ¹</u>		
<u>Certificated Passenger</u>	<u>Simulator and Aircraft</u>	<u>Level D ²</u>	<u>Level E ²</u>
<u>Seating Capacity/MCM</u>	<u>Level A, B or CAircraft</u>	<u>(simulator only)</u>	<u>(aeroplane only)</u>

<u>Single-engine</u>	<u>4.0</u>	1.0 ³	<u>4.0</u>	<u>4.0</u>
<u>Multi-engine</u>	<u>6.0</u>	1.5 ³	<u>6.0</u>	<u>6.0</u>
<u>Multi-engine ≥10 –</u>	<u>10.0</u>	<u>2.0</u> ³	<u>10.0</u>	<u>10.0</u>
<u>Multi-engine ≥10 –</u>	<u>10.0</u>	<u>2.0</u> ³	<u>12.0</u>	<u>12.0</u>

(b) for recurrent flight training –

<u>Maximum Certificated Mass</u>	<u>Flight Training (PF Hours) ¹</u>			
	<u>(except as approved in an advanced</u>			
	<u>Simulator and Aircraft</u>		<u>Level D</u>	<u>Level E ²</u>
	<u>Level A, B or C ²</u>	<u>Aircraft</u>	<u>²</u> <u>(simulat</u>	<u>(aeroplane</u>
			<u>or only)</u>	<u>only)</u>
<u>Single-engine</u>	<u>1.5</u> ⁴	<u>1.0</u> ³	<u>1.5</u> ⁴	<u>1.5</u> ⁴
<u>Multi-engine ≤15 000kg</u>	<u>2.0</u>	<u>1.0</u> ³	<u>2.0</u>	<u>2.0</u>
<u>Multi-engine >15 000kg</u>	<u>4.0</u>	<u>1.5</u> ³	<u>4.0</u>	<u>4.0</u>

Notes (applicable to both tables) –

- 1. Flight training times in the tables are expected to be flight times (block to block). Fifteen minutes is factored into the ground time for each flight. Time spent in excess of fifteen minutes on the ground is to be added to the air time spent in training for aeroplane-only training. Recurrent flight training is an annual requirement. Pilots shall complete an equal amount of pilot not flying (PNF) time in addition to the pilot flying (PF) times given in the tables.**
- 2. The times specified refer to the level of the training program approved in accordance with section 2.5.4(5)(a) of this TS. FSTDs approved as part of such training**

programs include –

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

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

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

(d) May be reduced to that time necessary to complete the following: Provided all other training has been completed in a FFS –

(1) one normal and one bailed landing;

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

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

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

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

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

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

(i) level A training program;

(ii) level B training program;

- (iii) level C training program;
- (iv) level D training program; or
- (v) level E aeroplane-only flight training program.

as described in sections 2.5.4(8) through (12) of this TS.

- (b) Where an operator utilises an FSTD other than those included in the flight training programs specified in paragraph (a), the Director shall make a determination with respect to the training and checking credits allowed for such FSTD on a case-by-case basis.
- (5) Recurrent training for all flight crew members shall meet the following requirements –
- (a) all items identified in the initial training syllabus shall be covered over a defined period of time (through a cycle); and
 - (b) a briefing shall be provided on changes that have occurred to the aircraft or its operation since the flight crew member's last training.
- (6) Each operator shall publish a flight training syllabus containing all items and maneuvers outlined in the applicable training program unless the training is contracted out, in which case the training syllabus of the contracted agency shall be published and available to the operator's flight crew members.
- (7) The flight training syllabus referred to in subsection (6) shall incorporate training sequences that reflect –
- (a) the type of operation, whether VFR, IFR or both;
 - (b) the type of aircraft and the equipment carried on board; and
 - (c) the flight regime in which operated.
- (8) Level A aeroplane type training program
- (a) A Level A training program shall provide for flight training using a combination of an approved Level A FFS of the type of aeroplane to be operated and the aeroplane. The operator is permitted to conduct most of the training elements of an initial and recurrent training program in that simulator. Flight training in an aeroplane shall be carried out for general handling and landing manoeuvres following training as specified in paragraph (c) below.
 - (b) Flight training shall include and be in accordance with all flight profiles published by the manufacturer, when such profiles are published, including

training in normal, abnormal and emergency operation of the aeroplane systems and components using the FFS. For operators of aeroplanes for which standard operating procedures (SOPs) are required, the training shall be given using such SOPs.

- (c) In addition to the training in a Level A FFS following initial training and, if required, recurrent training, at least three take-offs and landings and the following items and manoeuvres shall be completed in the aeroplane –
- (i) interior and exterior aeroplane pre-flight checks;
 - (ii) ground handling for pilots-in-command only, unless the aeroplane provides full steering capability from the second-in-command (SIC) flight crew stations and company procedures permit the SIC to conduct taxi operations;
 - (iii) normal take-off, visual circuit, where possible, and landing;
 - (iv) a full circling approach off an instrument approach to circling minima where the flight crew member is authorised to perform circling manoeuvres;
 - (v) a simulated engine failure procedure after take-off (at safe altitude and airspeed);
 - (vi) a normal missed approach;
 - (vii) a simulated engine inoperative landing; and
 - (viii) any other manoeuvre for which the simulator was not given training credits.
- (d) If a Level A flight simulator has differences in performance, systems or cockpit layout and configuration from the operator's aeroplane, additional training on these differences shall be provided either in the aeroplane or a training device that is representative of the operator's actual aeroplanes and is approved for use by the Director.

(9) Level B aeroplane type training program

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

aeroplane following recurrent FFS training need not be completed.

- (b) In addition to the training required in a Level A training program, training in an approved Level B FFS shall include recovery from turbulence and windshear on take-off and approach.
- (c) If a Level B flight simulator has differences in performance, systems or cockpit layout and configuration from the operator's aeroplane, additional training on these differences shall be provided either in the aeroplane or a training device that is representative of the operator's actual aeroplane and is approved for use by the Director.

(10) Level C aeroplane type training program

- (a) A Level C training program shall provide for flight training using an approved Level C FFS of the type of aeroplane to be operated. Except as provided in paragraph (b), initial flight training in an aeroplane shall be carried out for ground handling, landing manoeuvres and any other manoeuvre for which the Level C FFS has not been given a training and checking credit and shall include, as a minimum, interior and exterior aeroplane pre-flight checks. Flight training in the aeroplane following recurrent FFS training need not be completed.
- (b) Zero flight time training for candidates undergoing initial training with at least second-in-command experience on a similar aeroplane with the same operator or has otherwise had verifiable line currency as at least a second-in-command on a similar aeroplane within the previous two years is permitted

Note – For the purpose of this provision, “similar aeroplane” means both aeroplanes are operated in terms of Part 93 and are within the following categories –

1. turbo-jet to turbo-jet;
 2. turbo-fan to turbo-fan
 3. turbo-prop to turbo-prop; and
 4. reciprocating to reciprocating.
- (c) If a Level C flight simulator has differences in performance, systems or cockpit layout and configuration from the operator's aeroplane, additional training on these differences shall be provided either in the aeroplane or a training device that is representative of the operator's actual aeroplanes and is approved for use by the Director.

- (11) Level D aeroplane type training program
- (a) A Level D training program using an approved Level D FFS of the type of aeroplane to be operated permits zero flight time training.
 - (b) If a Level D flight simulator has differences in performance, systems or cockpit layout and configuration from the operator's aeroplane, additional training on these differences shall be provided either in the aeroplane or a training device that is representative of the operator's actual aeroplane and is approved for use by the Director.
- (12) Level E aeroplane-only flight training program
- (a) An aeroplane-only flight training program will only be approved in accordance with the simulator-use policy specified in section 3 of TS 93.03.1 of Document SA-CATS 93.
 - (b) Any simulated failure of aeroplane systems shall only take place under operating conditions which do not jeopardise safety of flight and never with passengers on board.
 - (c) The training program shall include and be in accordance with all flight profiles published by the manufacturer, when such profiles are published, including SOPs for normal, abnormal and emergency operation of the aeroplane systems and components.

2.5.5 Helicopter type flight training

Notes:

- 1. The operator's flight training program may be comprised of different combinations of the programs listed below. Flight training is normally acquired through a combination of different types and levels of training devices and in most cases a portion of the flight training would occur in a helicopter.
 - 2. If engine-out training exercises are conducted in a helicopter in accordance with an approved training program, no engine may be shut down.
- (1) Initial helicopter type training shall include visual, instrument and special flight procedures, as applicable, crew co-ordination in all phases of operation, normal, abnormal, emergency and supplementary procedures for the type of helicopter, including where applicable MEL and CDL provisions.
- (2) The operator shall develop and publish in its training program, a flight training syllabus and lesson plans for each phase of training for each type of helicopter operated showing, where required, which manoeuvres will be conducted in a

helicopter.

- (3) Initial, Upgrade and Recurrent Synthetic or Helicopter Flight Training for Flight Crew Members.
- (4) Flight training for flight crew members shall be carried out in accordance with one of the following training programs. Where an operator utilises a FSTD other than those included in the following flight training program combinations, the Director will make a case by case determination with respect to the training and checking credits allowed for such FSTD:
 - (a) level A training program;
 - (b) level B training program;
 - (c) level C training program;
 - (d) level D training program; or
 - (e) level E helicopter-only flight training program.
- (5) Recurrent training for all flight crew members on a helicopter or FSTD shall meet the following requirements:
 - (a) all items for the initial training syllabus shall be covered over a defined period of time (through a cycle); and
 - (b) a briefing shall be provided on changes that have occurred to the helicopter or its operation since the flight crew member's last annual training.
- (6) Each operator shall publish a flight training syllabus containing all items and manoeuvres outlined in the applicable training program indicated above.
- (7) Level A Training Program for Pilots
 - (a) An operator with an approved Level A training program using an approved Level A or better FFS is permitted to conduct most initial, upgrade and recurrent training in that simulator. Additionally, flight training in a helicopter shall be carried out for general handling and landing manoeuvres for initial training as specified in paragraph (d) of this training program.
 - (b) Flight training shall include and be in accordance with all flight profiles published by the manufacturer, when such profiles are published, including the following training in standard operating procedures for normal, abnormal and emergency operation of the helicopter systems and components, and shall be carried out in the FFS:
 - (i) use of checklists;
 - (ii) flight crew co-operation, command and co-ordination;
 - (iii) helicopter and cargo fire on the ground and while airborne;

- (iv) engine fire and failure
 - (v) effects of engine icing and anti-ice operation;
 - (vi) take-off, landing and flight with the critical engine inoperative and engine inoperative performance capabilities;
 - (vii) flight control failures and abnormalities;
 - (viii) hydraulic, electrical and other system failures;
 - (ix) failure of navigation and communication equipment;
 - (x) pilot incapacitation – recognition and response during various phases of flight;
 - (xi) steep turns and other flight characteristics such as unusual attitudes (as applicable for initial and upgrade only);
 - (xii) helicopter performance for hover-in-and out-of ground effect, climb, cruise, holding, descent and landing;
 - (xiii) normal, and performance limited take-offs;
 - (xiv) take-off and landing data calculations;
 - (xv) rejected take-off procedures;
 - (xvi) passenger and crew evacuation;
 - (xvii) flight management system, ground proximity warning system, airborne collision avoidance system head-up display, enhanced vision system and other specialized helicopter equipment, as applicable; and;
 - (xviii) inadvertent encounters with moderate or severe in-flight icing conditions where the helicopter is certified for flight into known icing conditions, as applicable.
- (c) Where the operator seeks authorisation for flight in IMC the following training in flight planning and instrument flight procedures shall be included:
- (i) departure, en route, holding and arrival; and
 - (ii) all types of instrument approaches and missed approaches in minimum visibility conditions using all levels of automation available, as applicable.
- (d) In addition to the training in a Level A FFS, at least 3 take-offs and landings including circuits and the following items and manoeuvres shall be completed in a helicopter of the same type as the FFS:
- (i) interior and exterior helicopter pre-flight checks;
 - (ii) ground handling for PICs only, unless the helicopter provides full steering capability from the second-in-command (SIC) flight crew station and company procedures permit the SIC to conduct taxi operations;
 - (iii) hover, normal take-off, visual circuit, where possible, and landing;
 - (iv) a full circling approach off an instrument approach to circling minima where the flight crew member is authorised to perform circling manoeuvres;
 - (v) a simulated engine failure procedure after take-off (at safe altitude and

airspeed);

- (vi) a normal missed approach;
- (vii) a simulated engine inoperative landing; and
- (viii) any other manoeuvre for which the simulator was not given training credits.

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

(f) In addition to the training prescribed in a Level A training program using a level A FFS, the proficiency check prescribed in Schedule One for helicopters of TS 93.03.8 shall be completed.

(8) Level B Training Program for Pilots

(a) An operator with an approved Level B training program using an approved Level B or better FFS is permitted to conduct most initial, upgrade and recurrent training in that simulator. Additionally, initial flight training in a helicopter shall be carried out for ground handling, hovering, landing manoeuvres and any other manoeuvre for which the Level B FFS has not been given training and checking credit.

(b) In addition to those items of training required by paragraphs in a level A training programme, training in an approved Level B flight simulator shall include recovery from turbulence and windshear on take-off and approach.

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

(d) In addition to the training prescribed in a Level B training program using a level B FFS, the pilot proficiency check prescribed in Schedule One for helicopters of TS 93.03.6 shall be completed.

(9) Level C Training Program for Pilots

(a) An operator with an approved Level C training program using an approved Level C FFS is permitted zero flight time training for candidates with at least second-in-command (SIC) experience on a similar helicopter with the same operator or has otherwise had verifiable line currency as a SIC on a similar helicopter within the previous two years:

Note: For the purpose of this provision, "similar helicopter" means both helicopters are operated in terms of Part 93 and are within the following groupings. Any type of helicopter not shown below, has not been considered for similar grouping and should be treated separately.

- (i) Agusta 109 and 119, all model series;
 - (ii) Bell 47, all model series (including Bell 47T);
 - (iii) Bell 206, all model series' (including 206 LT);
 - (iv) Bell 222, 230 and 430, all model series;
 - (v) Bell 204, 205, 210 and 212, all model series;
 - (vi) Bell 212 and 412, all model series;
 - (vii) Enstrom F28, 280 and 480, all model series;
 - (viii) Eurocopter AS 350, AS 355 and EC 130, all model series;
 - (ix) Eurocopter SA 330, AS 332 and EC 225, all model series;
 - (x) Eurocopter SE 313/3130, SE 316/3160 and SA 313 through 319 (Alouette II / Lama / Alouette III), all model series;
 - (xi) Eurocopter SA 360, SA/AS 365 and EC 155, all model series;
 - (xii) Eurocopter BK 117 and EC 145, all model series
 - (xiii) Eurocopter BO 105, all model series;
 - (xiv) Hiller 12E and 12ET, all model series;
 - (xv) Hughes/Schweizer Models 269, 300, 330 and 333, all model series;
 - (xvi) McDonnell Douglas/Hughes 500(369), 520, 530 and 600, all model series;
 - (xvii) McDonnell Douglas MD 900, 901 and 902 Explorer, all model series;
 - (xviii) Sikorsky S 55 and S 55T, all model series;
 - (xix) Sikorsky S 58 and S 58T, all model series;
 - (xx) Sikorsky S 61 and S 62, all model series;
 - (xxi) Sikorsky S 70, all model series; and
 - (xxii) Sikorsky S 76, all model series.
- (b) Candidates who do not qualify for zero flight time training shall, within 30 days of completion of the FFS training, accomplish the following training items in a helicopter:
- (i) interior and exterior helicopter pre-flight checks;
 - (ii) ground handling for PICs only, unless the helicopter provides full steering capability from the SIC flight crew station and company procedures permit the SIC to conduct taxi operations;
 - (iii) hovering, normal take-off, visual circuit (where possible) and landing;
 - (iv) a simulated engine failure procedure after take-off (at safe altitude and airspeed);
 - (v) a simulated engine inoperative landing; and

- (vi) a normal missed approach.
- (c) In addition to those items of training required in paragraphs (6)(b) and (c), training in an approved Level C FFS shall include:
 - (i) manoeuvring of the helicopter on the ground;
 - (ii) crosswind take-offs and landings to 100% of the published crosswind component;
 - (iii) a visual training program in the flight simulator to ensure VFR flight skills, covering scenarios of dusk and night with variable weather and visibilities. This program shall include the following:
 - (aa) normal and crosswind take-offs, visual circuits and landings with variable wind, runway illusion and surface conditions;
 - (bb) engine inoperative approach and landing;
 - (cc) engine failure procedures during take-off and missed approach;
 - (dd) no-electronic glideslope approach and landing;
 - (ee) approaches and landings with flight control failures and abnormalities; and
 - (ff) where the flight crew member is authorised to perform circling manoeuvres, a full circling approach from an instrument approach to circling minima for initial and recurrent training; and
 - (iv) a simulated line flight comprising at least 2 sectors (one as pilot flying and another as pilot not flying).
- (d) If a Level C flight simulator has differences in performance, systems or flight deck layout and configuration from the operator's helicopter, additional training on these differences shall be provided either in the helicopter or a training device that is representative of the operator's actual helicopters and is approved for use by the Director.
- (e) In addition to the training prescribed in a Level C training program using a Level C FFS, the pilot proficiency check prescribed in Schedule One for helicopters of TS 93.03.8 shall be completed.

(10) Level D Training Programme for Pilots

- (a) An operator with an approved Level D training program using an approved Level D FFS is permitted zero flight time training.
 - (b) In addition to the training required for a Level C program with the exception of the helicopter training requirements, the following FFS training shall be carried out at an appropriate point in the training program:
 - (i) A VFR training program in the Level D flight simulator of at least 4 hours per crew (2 hours as pilot flying and 2 hours of pilot not flying) is required, to ensure visual flight skills to cover either day or dusk and night with variable weather and visibility scenarios. This program shall include the following and may be accomplished as a single training session or dispersed throughout the schedule of lesson plans:
 - (aa) normal and crosswind take-offs, and visual circuits and landings, with variable wind, runway illusion and surface conditions;
 - (bb) engine inoperative approach and landing;
 - (cc) engine failure procedures during take-off and missed approach;
 - (dd) no visual aids approaches and landings; and
 - (ee) approaches and landings with flight control failures and abnormalities.
 - (c) Simulated line flights of at least two operational sessions (as pilot flying and two operational sessions as pilot not flying) are required. Pilot flying duties shall be carried out from the appropriate seat.
 - (d) If a Level D flight simulator has differences in performance, systems, or flight deck layout and configuration from the operator's helicopter, additional training on these differences shall be provided either in the helicopter or a training device that is representative of the operator's actual helicopters and is approved for use by the Director.
 - (e) In addition to the training prescribed in a Level D training program using a level D FFS, the pilot proficiency check prescribed in Schedule One for helicopters of TS 93.03.8 shall be completed.
- (11) Level E – Helicopter-only Flight Training Program
- (a) Any simulated failure of helicopter systems shall only take place under operating conditions which do not jeopardize safety of flight.
 - (b) The training program shall include and be in accordance with all flight profiles published by the manufacturer, when such profiles are published, including SOPs for normal, abnormal and emergency operation of the helicopter systems and components with the following:

- (i) use of checklists including interior and exterior pre-flight checks;
 - (ii) manoeuvring of the helicopter on the ground or on water (if applicable);
 - (iii) aspects of flight crew co-operation, command and co-ordination;
 - (iv) hover, normal take-off, visual circuit, approach and landing;
 - (v) simulated helicopter and cargo fire on the ground and while airborne;
 - (vi) simulated engine fire and failure;
 - (vii) briefings on effects of airframe and engine icing and anti-ice operation;
 - (viii) take-off, landing and flight with the critical engine simulated inoperative, and engine inoperative performance capabilities;
 - (ix) approach and landing;
 - (x) simulated hydraulic, electrical and other system failures;
 - (xi) simulated flight control failures and degraded states of operation, while in-flight, and during take-off and landing (as applicable);
 - (xii) simulated failure of navigation and communication equipment;
 - (xiii) simulated pilot incapacitation - recognition and response;
 - (xiv) steep turns and other flight characteristics (as applicable for initial and upgrade only);
 - (xv) helicopter performance for hover-in- or out-of-ground-effect, climb, cruise, holding, descent and landing;
 - (xvi) normal and performance limited take-offs;
 - (xvii) take-off data calculations;
 - (xviii) simulated rejected take-off procedures;
 - (xix) briefing on crew and passenger evacuation procedures; and
 - (xx) other specialised equipment, where applicable.
- (c) Where the operator is authorised for VFR flight at night or flight in IMC, the training program shall also include flight planning and instrument flight procedures with the following:
- (i) departure, en route, holding and arrival; and
 - (ii) all types of instrument approaches and missed approaches in simulated minimum visibility conditions, including circling approaches, where applicable, using all levels of automation available, as applicable.
- (d) In addition to the training prescribed in an helicopter-only training program, the pilot proficiency check prescribed in Schedule Two for helicopters of TS 93.03.8 shall be completed.

2.6 Regaining recency training for pilots

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

- (a) a briefing on changes that have occurred to the aircraft or its operation since the pilot's last flight; and
- (b) training in an aircraft or FFS that includes not less than 3 take-offs and landings and, for multi-engine aircraft, a simulated engine failure on take-off for aeroplanes, a simulated engine failure in hover for helicopters, a simulated engine failure on the missed approach (if applicable) and an engine-out landing; and
- (c) a line/operational check consisting of at least two sectors. In a helicopter, the candidate shall complete all take-offs and landings.

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

2.7 Regaining qualification training for pilots

- (1) Where a pilot's recency requirements have not been maintained in accordance with CAR 91.02.4 and that pilot's PPC has expired for less than 6 months, the following shall be completed to regain type qualification:
 - (a) all the requirements specified in section 2.6 of this TS, as applicable; and
 - (b) any recurrent training that may have come due during the absence from flying duties on that aircraft type.
- (2) Where the PPC on a specific aircraft type has expired from between 6 and 24 months, inclusive, the following shall be completed to regain type qualification:
 - (a) all the requirements of section 2.6 of this TS; and
 - (b) a technical ground training course consisting of an aircraft system review on that aircraft type and FSTD training, where applicable;
 - (c) a PPC as specified in this TS;
- (3) A pilot who's PPC has expired by more than 24 months but less than 60 months shall complete aircraft ground technical training and an examination. In addition, the operator and the PIC of an aircraft shall ensure that sufficient flight training has been provided to ensure the pilot is proficient on the aircraft, followed by a PPC. In developing the training program, the operator shall take cognisance of at least –
 - (a) the time since the pilot last flew the aircraft type; and
 - (b) the experience of the pilot on that type and/or similar aircraft.

Note – In each instance of a pilot regaining qualification under paragraph (3), the operator shall submit its proposed flight training program, including the number of flying hours planned, along with substantiation for arriving at that figure, to the Director for approval prior to conducting the training. The Director shall, within 48 hours,

approve, approve with conditions or not approve the program. Alternatively, the operator may publish in its operations manual several training programs catering to a variety of scenarios of pilot experience.

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

3. Required training for flight crew

Aeroplanes

3.1 Line or operational training (CAO only)

- (1) A Corporate Aviation Operator shall ensure that, following completion of initial type rating or upgrade training, each flight crew member appointed by it to operate large aircraft completes line training. The flight crew member shall serve in the capacity to be served with the operator over routes typical of those over which the flight crew will be expected to fly for the operator. Those items that cannot be covered as a natural occurrence during the line flying operations shall be covered by briefing or other discussion.
- (2) Line induction for flight crew member's sectors/hours requirements
- (a) For the purposes of this TS, the aeroplane groups are –
- (i) reciprocating engine;
 - (ii) turbo-propeller engine; or
 - (iii) turbo-jet engine.
- (b) Initial line induction is required for crew members who have not qualified and served in the same capacity on the same group of aeroplanes;
- (c) Transition line induction is authorised for crew members who have qualified and served in the same capacity on the same group of aeroplanes.
- (d) During line induction, a flight crew member shall be given the minimum flight times and sectors in accordance with this TS while performing the duties appropriate to the crew station. Line induction training is calculated by a combination of flight hours and flight sectors. The required number of flying hours and sectors may be completed during proving or ferry flights or during normal line operations and apply to the PIC and the SIC.
- (e) Initial line induction shall be conducted under the supervision of a flight training pilot during which time the PIC and SIC shall perform their duties in their respective position, with the training pilot occupying the opposite pilot operating position.

- (f) Initial or upgrade line induction requires that the PIC and SIC receive not less than four flight sectors, two sectors of which are to be performed as PF and two sectors as PNF;
- (g) Initial or upgrade line induction requires that each flight crew member receives the following minimum number of flight hours –
 - (aa) in the case of large aeroplanes with reciprocating engines –
 - (A) 10 hours; and
 - (B) after completing the four mandatory sectors, the remaining time may be reduced by 1 hour for each additional sector flown to a maximum reduction of 5 hours;
 - (bb) in the case of large aeroplanes with turbo-propeller engines –
 - (A) 15 hours; and
 - (B) after completing the four mandatory sectors, the remaining time may be reduced by 1 hour for each additional sector flown to a maximum reduction of 7.5 hours; and
 - (cc) in the case of large aeroplanes with turbo-jet engines –
 - (A) 25 hours; and
 - (B) no reduction of the original time requirement shall be permitted.
- (h) Transition line induction requires that each flight crew member receives, in the case of the PIC and SIC, not less than three flight sectors of which at least one sector is to be performed as PF and one sector as PNF.
- (i) Transition line induction requires that each flight crew member receives the following minimum number of flight hours –
 - (i) in the case of aeroplanes with reciprocating engines –
 - (aa) 10 hours; and
 - (bb) after completing the three mandatory sectors, the remaining time may be reduced by 1 hour for each additional sector flown to a maximum reduction of 5 hours;
 - (ii) in the case of aeroplanes with turbo-propeller engines –
 - (aa) 15 hours; and
 - (bb) after completing the three mandatory sectors, the remaining time

may be reduced by 1 hour for each additional sector flown to a maximum reduction of 7.5 hours; and

- (iii) in the case of aeroplanes with turbo-jet engines –
 - (aa) 20 hours; and
 - (bb) after completing the three mandatory sectors, the remaining time may be reduced by 1 hour for each additional sector flown to a maximum reduction of 10 hours.

Helicopters

3.2 Operational training (CAO only)

- (1) On initial multi pilot helicopter assignment or upgrade, operational training shall be conducted over parts of the operator's route structure which are typical of those over which the flight crew will be expected to fly.
- (2) Operational training is required for flight crew members who have not qualified and served in the same capacity on the same group of helicopters and for pilots upgrading to PIC on any helicopter.

Note: The grouping of helicopters referred to here are as described in the Note to section 2.5.5(8)(a) of this TS.

- (3) During operational training, a flight crew member shall be given the minimum flight times and sectors specified in the operator's operations manual while performing the duties appropriate to the crew station. Operational training is calculated by a combination of flight hours and flight sectors. The required number of flying hours and sectors may be completed during proving or ferry flights or during normal line operations and apply to the PIC and where applicable, the SIC.
- (4) Initial operational training shall be conducted under the supervision of a training pilot during which time the PIC and SIC shall perform their duties in their respective position, with the training pilot occupying the opposite pilot operating position.
- (5) The following areas, as applicable, shall be covered during operational training and noted in records as having been completed. Those items that cannot be covered as a natural occurrence during the line flying operations shall be treated as discussion items. In as much as practicable these discussions shall occur during flight time when in the opinion of the training pilot such discussions can be carried out without undue distraction to the pilots under supervision:
 - (a) Command of the helicopter:

- (i) crew management and discipline;
 - (ii) responsibilities of the PIC and other flight crew members;
 - (iii) responsibilities of the cabin crew, if applicable; and
 - (iv) briefing of crew members.
- (b) Helicopter and equipment:
- (i) MEL policy and procedures;
 - (ii) Certificate of Airworthiness and other helicopter documentation;
 - (iii) deferred defects;
 - (iv) maintenance release;
 - (v) manuals and log books;
 - (vi) flight data recorder and cockpit voice recorder, if applicable; and
 - (vii) emergency exits and emergency equipment on board, to the extent applicable.
- (c) Dispatch:
- (i) personnel, hours of operation, operational control;
 - (ii) operator's flight and duty period scheme; and
 - (iii) operator fuel policy.
- (d) Helicopter servicing and ramp safety:
- (i) fuelling procedures and weather implications;
 - (ii) load security;
 - (iii) ground equipment and handling;
 - (iv) operator's helicopter de-icing policy and procedures; and
 - (v) helicopter parking.
- (e) Reporting for duty.
- (f) Licence requirements.
- (g) Helicopter library.
- (h) Departure delays due to unforeseen circumstances.
- (i) Pre-flight safety and crew briefings.
- (j) Starting engines.
- (k) After-start checks.
- (l) Pre-flight checks and securing cabin.
- (m) (Hover-)taxiing
- (n) Rejected take-off.
- (o) Departure sequence:
- (i) lookout; and
 - (ii) after take-off checks.

- (p) Climb procedures.
- (q) Cruise:
 - (i) fuel management and checks; and
 - (ii) en route diversion.
- (r) Approach Procedures:
 - (i) organisation and briefing of approach;
 - (ii) descent; and
 - (iii) pre-landing check and cabin security.
- (s) Landing and taxiing:
 - (i) surface conditions; and
 - (ii) after landing checks.
- (t) Shutdown.
- (u) Flight and maintenance logs and records.
- (v) Defect recording and clearing.
- (w) Emergency procedures:
 - (i) hi-jack, bomb threat procedures;
 - (ii) helicopter evacuation;
 - (iii) aerodrome emergency services; and
 - (iv) engine inoperative procedures.

3.3 Differences and familiarisation training

- (1) Where the responsible person intends to assign a flight crew member to variant types of aircraft or different types with very similar characteristics, the responsible person shall, using SA-CATS 61 for guidance, determine whether the pilot must be provided differences or familiarisation training.
- (2) Where significant differences exist within the fleet of aircraft, or variants of aircraft, or between the aircraft operated and the training device approved for use, the aircraft type technical and flight training syllabus shall contain such differences training.
- (3) Where only minor differences exist within the fleet of aircraft, or variants of aircraft, or between the aircraft operated and the training device approved for use, the aircraft familiarisation training appropriate to the differences shall be given and recorded in the crew member's training file.
- (4) Differences and familiarisation training shall include, as a minimum, a knowledge examination following the ground training. The requirement for a skills test will be determined by the Director based upon an assessment of the degree of the differences.

3.4 Upgrade training

- (1) Where a flight crew member is currently proficient as SIC on a type of aircraft wishes to operate as PIC on that type, such person shall undergo:
 - (a) upgrade training and checking to include the following:
 - (i) successfully complete simulator manoeuvres training and training as a PIC in all areas of aircraft handling that are specific to the PIC seat position;
 - (ii) command and decision making;
 - (iii) successfully complete specialised operations qualification training (e.g. lower take-off limits, etc.);
 - (iv) successfully complete on that type of aircraft the initial PPC conducted by an approved DFE; and
 - (v) initial line/operational training for a PIC followed by a line/operational check.
 - (b) Where a SIC has never upgraded to PIC on the class or category of aircraft to be flown and whose SIC proficiency has expired within the preceding 24 months, such SIC shall complete a technical ground training course consisting of an aircraft system review on that aircraft type prior to or as part of the upgrade training program.

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

3.5 Pilot qualification to operate in either pilot's seat

- (1) A PIC whose duties also require him or her to carry out the duties of pilot-flying and pilot monitoring from both flight crew stations shall complete additional training. This additional training shall be accomplished from the SIC crew position and include at least two landings during completion of the following:
- (a) an engine failure during take-off;
 - (b) one engine inoperative approach and go-around;
 - (c) one engine inoperative landing;
Note: The preceding engine-out exercises are not applicable to single-engine aircraft.
 - (d) Category II or Category III operations, if applicable; and
 - (e) operation of the normal and emergency checklist as pilot-not-flying.
- (2) The training required by subsection (1) shall be completed upon initial assignment and every 12 months thereafter unless the pilot has completed all of the training elements specified in the training program during normal line operations within the preceding 12 month period prior to operating from a seat for which he or she is not qualified.
- (3) The checks referred to in subsection (1) above may be accomplished during a normal PPC.
- (4) A record of the training completed and/or operational means of qualifying to act from either flight crew station shall be maintained in the pilot's training file.

3.6 Area, route and aerodrome familiarisation training

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

3.7 Reduced Vertical Separation Minima (RVSM) training (as applicable)

- (1) No pilot may operate in RVSM airspace unless such pilot has received initial training from an approved training organisation or through an operator's approved training program with respect to operating in RVSM airspace and, for pilots who have not

operated in RVSM airspace in the preceding 12 months, recurrent training.

- (2) For a flight crew member to qualify for operations in RVSM airspace, he or she shall be proficient in the following areas –
- (a) knowledge of the floor, ceiling and horizontal boundaries of the RVSM airspace to be operated in;
 - (b) rules on exclusion of non-RVSM compliant aircraft;
 - (c) pilot procedures with respect to –
 - (i) pre-flight and in-flight altimeter checks;
 - (ii) use of the automatic altitude control system;
 - (iii) minimum equipment list (MEL) items applicable to RVSM operations;
 - (iv) special procedures for in-flight contingencies;

 - (v) weather deviation procedures;

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

 - (vii) climb and descent procedures and pilot level-off call;
 - (d) procedures for flight of non-RVSM compliant aircraft for maintenance, humanitarian or delivery flights; and
 - (e) use of ACAS/TCAS.

3.8 ACAS or ACAS II training including ACAS II cyclic training

- (1) ACAS training is applicable to at least the PIC where the aircraft is required to be operated with an approved, serviceable airborne collision avoidance system (ACAS).
- (2) An ACAS training program shall ensure that on completion the pilot is able to demonstrate proficiency in the following:
 - (a) knowledge of ACAS II concepts, systems and procedures; and
 - (b) cognitive, procedural and motor skills necessary to properly respond to ACAS advisories.
- (3) There are no formal ACAS evaluation requirements for flight testing and examination. An ACAS instructor shall accomplish evaluation of ACAS objectives during training.
- (4) A pilot shall complete ACAS initial training in respect of each aircraft type for which he or she is rated in which is carried ACAS equipment.

- (5) ACAS initial training may be provided as a stand-alone module of ground and flight training or may be integrated with other initial, differences or upgrade ground and flight training programs.
- (6) An operator may contract with another operator, or with an ATO approved to operate an aircraft for instrument flight instruction, to provide the ACAS initial training to its flight crew, provided such contract is in accordance with the provisions specified in TS 93.03.2.
- (7) An operator shall certify in the pilot's file that the ACAS training and checking has been accomplished to a satisfactory standard.
- (8) ACAS renewal training
- (a) ACAS renewal training:
- (i) shall be integrated with recurrent flight training during proficiency training or line or operational flight training; and
- (ii) ground training shall be provided as a stand-alone module and should address any significant issues identified by line operating experience, system changes, procedural changes or unique characteristics such as the introduction of new aircraft display systems or operations in airspace where high numbers of traffic advisories (TA) and resolution advisories (RA) have been reported.
- (b) Routine ACAS operations shall be included in all evaluation environments and testing officers should include ACAS as a routine discussion item.
- (c) A pilot completes ACAS renewal training when:
- (i) an ACAS instructor certifies in the pilot's logbook that the pilot has completed ACAS renewal training conducted by the operator as part of its approved training program or an ATO approved to operate aircraft for instrument flying training; or
- (ii) a SACAA flying inspector certifies in the pilot's logbook that the pilot has completed ACAS renewal training prescribed by the SACAA.
- (d) An ACAS instructor is deemed to have completed ACAS renewal training when the instructor conducts ACAS initial training or ACAS renewal training.
- (9) ACAS cyclic training
- (a) A pilot completes a session of ACAS cyclic training when a check pilot certifies

in the pilot's logbook that the pilot has successfully completed a training session.

- (b) A pilot is deemed to have completed:
 - (i) ACAS initial training on the first occasion that the pilot completes a session of ACAS cyclic training; and
 - (ii) ACAS renewal training on the second or a subsequent occasion that the pilot completes a session of ACAS cyclic training.
- (c) A check pilot is deemed to have completed ACAS renewal training when the check pilot conducts ACAS cyclic training.

(10) ACAS training program requirements

- (a) Each ACAS curriculum shall ensure the equipment manufacturer's recommended training and testing requirements are carried out in the manner prescribed by such manufacturer.
- (b) In any case a pilot's ability to demonstrate system and procedural concepts shall be included in the initial, recurrent and where applicable, the regaining competency testing.

3.9 Training for low visibility operations

(1) General

- (a) Low visibility operations (LVO) are comprised of lower-than-normal visibility minima take-off (LVTO) and lower-than-normal weather and visibility minima approach operations (Category II and III (CAT II/III) approaches).
- (b) Flight crew member training programs for LVO shall include structured courses of ground, simulator and flight training. The training is aircraft-specific; however, credits may be given from one aircraft type to another based on the similarities between the types. The operator may abbreviate the course content as prescribed by paragraphs (c), (d) and (e) below provided the content of the abbreviated course is acceptable to the Director.
- (c) Flight crew members with no CAT II or III experience must complete the full training program prescribed in sections (2), (3) and (4) below.
- (d) Flight crew members with CAT II or III experience with another owner or operator may undertake an abbreviated ground training course but shall complete the flight training, check and line flying under supervision.

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

(2) Ground training

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

(3) Flight training

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

(b) An operator approved contracted training organisation must ensure that each flight crew member is trained to carry out his or her duties and instructed on the co-ordination required with other flight crew members.

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

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

(a) Ground training –

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

(b) FSTD training –

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

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

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

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

(5) Line or operational flying under supervision

(a) An operator must ensure that each flight crew member undergoes the following line flying under supervision –

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

(b) for CAT III, a minimum of three autolands except that only one autoland is required when the training required in subsections (3) or (4), as applicable, has been carried out in a full flight simulator usable for zero flight time training.

(6) Type and command experience

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

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

(ii) 100m must be added to the applicable CAT II or III RVR minima unless he or she has previously qualified for CAT II or III operations with another owner or operator until attaining 100 hours or 40 sectors, whichever is later, as pilot-in-command on the type.

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

(7) LVTO

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

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

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

- (iii) take-off in minimum authorised conditions or RVR conditions with an engine failure before V1 resulting in a rejected take-off.
 - (b) An operator shall ensure that the training required by subsection (3) or (4) above, as appropriate, above is carried out in an approved simulator. This training shall include the use of any special procedures and equipment.
 - (c) An operator must ensure that a flight crew member has completed a check before conducting low visibility take-offs with an RVR of less than 400m.
- (8) LVO recurrent training and checking
- (a) A Corporate Aviation Operator or PIC must ensure that, in conjunction with the normal recurrent training and PPCs, a flight crew member's knowledge and ability to perform the tasks associated with the particular category of operation, including LVTO, for which he or she is authorised, is checked. The required number of approaches to be conducted during such recurrent training is to be a minimum of two, one of which is to be a missed approach and at least one low visibility take-off to the lowest applicable minima. The period of validity for this check shall be the same as the recurrent training approved for the operator.
 - (b) An approved flight simulator shall be used for LVO training and checking.
 - (c) A Corporate Aviation Operator or PIC must ensure that, for CAT III operations on aircraft with a fail passive flight control system, a missed approach is completed at least once every 18 months as the result of an autopilot failure at or below decision height when the last reported RVR was 300m or less.
- (9) LVTO and CAT II or III recency requirements
- (a) A Corporate Aviation Operator or PIC must ensure that, in order for flight crew members to maintain a CAT II or III qualification, they have conducted a minimum of 3 approaches and landings using approved CAT II or III procedures during the previous six month period, at least one of which must be conducted in the aircraft.
 - (b) Recency for LVTO is maintained by retaining the CAT II or III qualification prescribed in paragraph (a) above.
 - (c) An operator may not substitute this recency requirement for recurrent training.

3.10 Single-engine IFR and night VFR training (CAO only)

Aeroplanes

- (1) A Corporate Aviation Operator shall provide initial and recurrent training to ensure its pilots are able to safely conduct operations in single-engine aircraft in flight under the instrument flight rules (IFR) and at night. Such training shall be completed on each aircraft type flown unless the Director permits a reduction in training based on similarities between the aircraft types flown. The PIC shall insure the required training has been completed.
- (2) The training required by subsection (1) shall be completed –
- (a) prior to initial assignment on a single-engine aircraft carrying passengers, cargo or both under IFR or at night; and
- (b) every 12 months thereafter.
- (3) Table 1 prescribes the minimum conversion and recurrent training to be accomplished on single-engine aircraft authorised to be operated under IFR or at night.

Table 1

Minimum Training Time Requirements

<u>Type of Operation</u>	<u>INITIAL</u>		<u>RECURRENT</u>	
	<u>Aeroplane only</u>	<u>Simulator only</u>	<u>Aeroplane only</u>	<u>Simulator only</u>
<u>Passenger carriage</u>	<u>4.0</u>	<u>4.0</u>	<u>1.0</u>	<u>N/A</u>
<u>Cargo-only carriage</u>	<u>2.0</u>	<u>N/A</u>	<u>1.0</u>	<u>N/A</u>

Notes –

1. Written exams are mandatory at completion of both Initial and recurrent ground training.
2. Synthetic training device and aeroplane times are pilot flying (PF) times only.
3. The Director will determine on a case by case basis what combination of aeroplane or simulator training totalling 4 hours is to be accomplished based on the simulator's approved capabilities.

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

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

Helicopters

3.11 Single-engine IFR and night VFR training

3.11.1. Flight crew requirements

- (1) Training requirements shall be published in the operator's operations manual and must be accomplished on each specific helicopter type or variant authorised to operate at night.
- (2) At least the following exercises are required to be practised as part of the approved training program:
- (a) engine fire on ground;
 - (b) engine failure in flight;
 - (c) loss of all but emergency electrical power;
 - (d) hydraulic and other system malfunctions, as applicable;
 - (e) rejected take-offs and landings;
 - (f) if applicable, Standard Operating Procedures (SOP) containing crew co-ordination;
 - (g) practise in engine-out autorotation scenarios; and
 - (h) descents and approaches to, and landings on an unprepared surface, both with and without the engine operating.
- (3) In addition to the training specified in section (2), each person assigned to act as a flight crew member in single engine (SE) night flight shall undergo a pilot proficiency check (PPC).
- (4) The PPC referred to in section (3) above shall be conducted by an authorised officer, DFE or Grade I or II flight instructor: Provided such person has, at least, accomplished the training required by this TS and a PPC on the helicopter type.
- (5) Each person who successfully passes a PPC shall receive certification in his or her training records that authorises him or her to operate SE helicopters at night while transporting passengers or cargo, as applicable.

3.11.2. Special procedures requirements

- (1) The Corporate Aviation Operator shall publish in its operations manual special procedures for the conduct of single-engine operations while transporting passengers at night, including the minimum operating height if the ground or sea surface is not lighted and the maximum distance the helicopter is permitted to operate away from a lighted area. Such special procedures must adopt every reasonable measure to mitigate environmental or operational risks and shall include at least that the helicopter shall not be operated in known or forecast icing conditions.
- (2) The Director may require additional procedures, restrictions or conditions in the interests of safety.

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

Aeroplanes

- (1) An owner or operator may not conduct single-pilot flight under IFR or at night unless the PIC, within the preceding 12 months, has completed the following single-pilot training in the aeroplane, a FSTD or a combination of aeroplane and FSTD –
 - (a) if flight under IFR is to be undertaken, the following training under simulated or actual IMC –
 - (i) a minimum of five approaches consisting of at least one precision and one non-precision approach;
 - (ii) at least two instrument departures, one of which shall be with an engine out;
 - (iii) at least one missed approach during which an engine failure is introduced;
 - (iv) at least one engine-out approach; and
 - (v) at least three landings from approaches, one of which shall be with an engine out; and
 - (b) if night flight is to be undertaken, five take-offs and landings at night.

Notes –

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

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

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

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

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

Helicopters

(1) A Corporate Aviation Operator or PIC may not conduct single-pilot IMC or night flight operations unless the PIC, within the preceding 90 days, has completed the following single-pilot training in the helicopter, a FSTD or a combination of helicopter and FSTD:

(a) if flight in IMC is to be undertaken:

(i) at least two instrument departures, under simulated or actual IMC which shall include at least one simulated engine failure after take-off in a simulator or under simulated IMC;

(ii) a minimum of five approaches consisting of at least two precision or non-precision approaches;

(iii) in a multi-engine helicopter:

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

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

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

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

3.14 Dangerous goods

(1) A Corporate Aviation Operator authorised to transport dangerous goods shall complete the training specified in CAR 92.00.8 and publish such training in its operations manual.

(2) The PIC shall ensure he/she has completed the training in CAR 92.00.8 before transporting dangerous goods.

- (3) A Corporate Aviation Operator not authorised to transport dangerous goods shall complete dangerous goods awareness training for operations personnel and other employees likely to come into contact with passengers or their baggage or personal effects –
- (a) upon initial employment; and
 - (b) every 24 months thereafter.

3.15 Other courses of training as deemed appropriate by the Director

- (1) A Corporate Aviation operator authorised to conduct the following specialised operations, or any other, shall provide training in the equipment and procedures associated with such approvals –
- (a) extended range twin-engine operations (ETOPS);
 - (b) all weather operations;
 - (c) GNSS;
 - (d) RNAV;
 - (e) land and hold short operations; and
 - (f) simultaneous operations on parallel or near-parallel instrument runways – ILS/precision runway monitor (PRM) and localizer type directional aid (LDA)/PRM – simultaneous offset instrument approaches (SOIA) training.
- (2) A flight crew member, operating in accordance with CAR 93.01.1(1)(a) and (b), authorised to conduct specialised operations, as listed in subsection (1) (a)-(f) above, shall ensure he or she has received training in the equipment and procedures associated with such approvals.
- (3) Other courses that may be considered necessary to ensure safety of flight operations may include but not be limited to –
- (a) MEL training;
 - (b) high altitude training;
 - (c) operations in ground icing conditions, if applicable;
 - (d) one-engine Inoperative ferry flight training;
 - (e) CFIT;
 - (f) low-energy awareness training; and

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

93.03.5 CORPORATE EMPLOYEE AND SERVICE AGENT TRAINING

1. Load Masters and Winch Operators

- (1) A Corporate Aviation Operator shall provide load masters and winch operators with at least the following training:
- (a) company induction training upon initial hire;
 - (b) initial and annual recurrent type training on each aircraft in which the person will be operating;
 - (c) where applicable, differences or familiarisation training;
 - (d) if the operator is authorised to carry dangerous goods, dangerous goods training or, if not so authorised, dangerous goods awareness training;
 - (e) training in the policies and procedures associated with their assigned tasks;
 - (f) for loadmasters, theoretical and practical training in mass and balance calculations, load planning, the use of the equipment used in loading an aircraft and any other training deemed necessary for the loadmaster to carry out his or her duties; and
 - (g) for winch operators, theoretical and practical training as necessary to carry out his or her duties.

2. Flight Operations Officers

Notes:

1. Any reference to “equivalent course of studies” in this TS means that credit may be given for previous training received towards a pilot licence but that additional training may be required.
2. For persons without any formal training, credit may be given based on relevant experience but is subject to a knowledge assessment by the SACAA or a SACAA approved person.

2.1. Qualifications of Flight Operations Officer instructors and examiners

- (1) A Corporate Aviation Operator shall not assign any person to provide and no person shall provide any generic or operator-specific flight operations officer (FOO) training required in terms of Division Four of CAR Subpart 3, unless such person:

- (a) has successfully completed a FOO generic course of studies or an acceptable equivalent course of studies and received certification from the approved training organisation having conducted the training; and
 - (b) has successfully completed the operator-specific FOO training and received a certificate of competency issued by the operator in terms of this technical standard.
- (2) An operator shall not assign and no person shall act as a FOO examiner unless such person:
- (a) is the holder of a current FOO certificate of competency appropriate to their assigned duties;
 - (b) has completed the FOO training referred to in subparagraph (a) appropriate to their assigned duties, and
 - (c) has been certified by the operator to act as a FOO examiner for those types of operational control systems and aircraft listed in the certification.

2.2. Qualifications of a Flight Operations Officer

- (1) No person may be assigned to FOO duties, except under adequate supervision, unless such person:
- (a) in the case of a new hire FOO, has:
 - (i) completed the generic training outlined in section 2.3 or an acceptable equivalent course of studies;
 - (ii) completed the operator-specific training required by section 2.4; and
 - (iii) been issued a certification of competence by the operator indicating the operational control system(s) and company aircraft authorised; or
 - (b) has undergone the operator's specific FOO training and demonstration of competence within the 12 months preceding such assignment: Provided:
 - (i) the FOO's training file provides evidence of the completion of the training and demonstration of competence approved by that operator; and
 - (ii) the FOO has been issued a certification of competence issued by the operator indicating the operational control system/s and company aircraft authorised.

- (2) Where a FOO has previously undergone the generic training prescribed in section 2.3, the validity of which has not lapsed, the requirements of subsection (1)(a)(i) above are deemed to have been met.
- (3) No operator shall assign a FOO to duty when such person has not acted in that capacity:
 - (a) for a period of six months, unless such person has undergone a briefing on changes to procedures or other changes in the operational control system (OCS) that have occurred since the person last served;
 - (b) for a period of one to two years, unless such person has undergone the recurrent course of studies;
 - (c) for a period of greater than two years, unless such person has undergone the initial course of studies of the company-specific training and has successfully completed the appropriate check; and
 - (d) for a period of five years since completion of the generic operations officer training, unless such person has acted as a FOO for at least six months in the preceding 24 months, unless such person:
 - (i) has undergone refresher training based upon the generic course; and
 - (ii) has completed the company-specific training and has successfully completed the appropriate check.

2.3. Flight Operations Officer Generic Training

- (1) The following subjects form the basis for generic training:
 - (a) air law – rules and regulations relevant to a FOO, appropriate air traffic services practices and procedures;
 - (b) aircraft general knowledge:
 - (i) principles of operation of aircraft powerplants, systems and instruments;
 - (ii) operating limitations of aircraft and powerplants; and
 - (iii) minimum equipment list;
 - (c) flight performance calculation, planning procedures and loading:
 - (i) effects of loading and mass distribution on aircraft performance and flight characteristics; mass and balance calculations;

- (ii) operational flight planning; fuel consumption and endurance calculations; alternate aerodrome selection procedures; en route cruise control; extended range operation;
- (iii) preparation and filing of air traffic services flight plans; and
- (iv) basic principles of computer-assisted planning systems;
- (d) human performance – human performance relevant to dispatch duties;
- (e) meteorology:
 - (i) aeronautical meteorology; the movement of pressure systems; the structure of fronts, and the origin and characteristics of significant weather phenomena which affect take-off, en-route and landing conditions; and
 - (ii) interpretation and application of aeronautical meteorological reports, charts and forecasts; codes and abbreviations; use of, and procedures for obtaining, meteorological information;
- (f) navigation – principles of air navigation with particular reference to instrument flight;
- (g) operational procedures:
 - (i) use of aeronautical documentation;
 - (ii) operational procedures for the carriage of freight and dangerous goods;
 - (iii) procedures relating to aircraft accidents and incidents;
 - (iv) emergency in-flight procedures; and
 - (v) procedures relating to unlawful interference and sabotage of aircraft;
- (h) principles of flight – principles of flight relating to the appropriate category of aircraft; and
- (i) radio communication – procedures for communicating with aircraft and relevant ground stations.

(2) Practical Training.

The applicant shall have served under the supervision of a FOO or, in the case of an

operator having only one FOO, a suitably qualified person designated by the person responsible for flight operations or approved by the Director, for at least 90 working days within the six months immediately preceding the application.

2.4. Operator-specific flight operations officer training – general

- (1) The Corporate Aviation operator shall establish and maintain approved ground training programmes for FOOs in its employ whether on a full-time or part-time basis or are otherwise engaged under the provisions of contractual services approved by the Director for that operator.
- (2) Each training programme shall be published in the operations manual referred to in CAR 93.04.2.
- (3) Each training curriculum shall be appropriate to the employee's duties and in consideration of the type and complexity of the Operational Control System (OCS) approved for the operator.
- (4) Each FOO or flight follower trainee shall receive operator-specific training as outlined in the applicable curriculum.

2.5. Flight operations officer training

- (1) The operator-specific FOO training programme shall be published as individual syllabi in terms of initial, recurrent, transition, flight familiarisation and regaining competency training based upon the following:
 - (a) initial training is a course of studies given to each new hire and covers the complete initial company induction syllabus and complete aircraft type training syllabus as relating to the person's assigned duties. Initial training and the related examinations shall be reviewed and revised from time to time and at any time new information becomes relevant to the OCS as the result of operational or safety management system (SMS) feedback;
 - (b) recurrent training shall occur every 12 months and include new material that may have been added to the initial course of studies or new information resulting from operational experience that may affect the efficiency, effectiveness or safety of the operator's OCS;
 - (c) transition training is training provided for any FOO to make a transition from one type of aircraft type or variant to another except where the Director allows such aircraft or variants to be grouped together as, an aircraft type;
 - (d) flight familiarisation is training provided to each FOO for the purpose of ensuring an enhanced knowledge of the operational practices of a flight in progress and the manner of interfacing with the flight watch system.; and

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

2.6. Operator's company induction syllabus for initial training

- (1) The content of a company induction training programme for a FOO shall include:
 - (a) the operations manual system covering pertinent information dealing with:
 - (i) manual structure including all manuals providing need to know information for dispatchers and the amendment procedures for such manual system;
 - (ii) company management organisation and how the OCS interfaces with management;
 - (iii) duties and responsibilities of those exercising operational control of flight following services;
 - (iv) operators approved for categories A or B operational control system, a full description of the system so approved;
 - (v) specific domestic and foreign rules and regulations significant to the operator by virtue of its type and area of operation giving emphasis on regulatory differences from the South African civil aviation regulations;
 - (vi) dispatch release policy;
 - (vii) procedures for the resolution of conflict between the dispatcher and the PIC;
 - (viii) flight following services and provision of information to a flight;
 - (ix) local weather patterns and tendencies;
 - (x) operator's fuel policy;
 - (xi) dispatch interface with the operator's SMS;
 - (xii) dispatch interface with the operator's QA programme;
 - (xiii) details of the operator's security programme, if applicable;
 - (xiv) details of the maintenance release policy;

- (xv) details of the operator's emergency response plan including OCS participation in overdue or missing aircraft;
- (xvi) handling a declaration of an emergency;
- (xvii) operational weather minima;
- (xviii) the approved types of operational flight plans and flight planning procedures;
- (xix) crew resource management training including human factors, risk analysis and error management training;
- (xx) dangerous goods training as applicable;
- (xxi) details of the operator's load control procedures;
- (xxii) details of the operator's communication equipment and policies including communication failure procedures;
- (xxiii) details of the operator's official reporting systems;
- (xxiv) surface contamination training where the operator operates into areas where surface contamination is known to exist; and
- (xxv) company policy with respect to the dissemination of information relating to:
 - (aa) weather conditions or known severe or weather phenomena;
 - (bb) notams; or
 - (cc) security measures;
- (b) details of the CAOC and operations specifications
 - (i) Part A General provisions;
 - (ii) Part B En route authorisations and limitations including special authorities;
 - (iii) Part C Aerodrome authorisations and limitations;
 - (iv) Part D Maintenance;
 - (v) Part E Mass and balance;

- (vi) Part F Interchange of equipment operations; and
 - (vii) Part G Aircraft leasing operations; and
 - (c) any other subject area the Director deems to be pertinent.
- (2) The content of a company induction training programme for a flight follower shall include those items from subsection (1) related to the flight follower's duties.

2.7. Flight familiarisation training – FOO

- (1) A Corporate Aviation operator shall provide to each FOO flight familiarisation training every 12 months as an observer occupying a flight deck observer seat during not less than one flight sector. The flight deck seat should provide the FOO with the ability to hear all voice communications.
- (2) Flight familiarisation must commence at the dispatch centre and the observer given the opportunity to receive the briefing and to witness how this information is used for the different phases of the flight.
- (3) Flight familiarisation shall be recorded and signed by the observer and the pilot-in-command.

3. Security training for ground personnel

- (1) A corporate aviation operator shall provide security training for the purpose of heightening overall security awareness among the ground operating personnel whose function is essential to flight operations. Ground personnel considered significant to aircraft operations would include but not be limited to –
 - (a) personnel designated as dangerous goods packing, shipping or loading of dangerous materials;
 - (b) service counter personnel;
 - (c) personnel designated as cargo, mail or baggage handlers;
 - (d) catering personnel;
 - (e) service personnel whose function would require coming into contact with or have access to an aircraft or its loading or service bays;
 - (f) maintenance personnel; or
 - (g) personnel who man stores handling anything that is designated for, or is likely

to be placed on an aircraft.

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

93.03.6 CHECKING OF FLIGHT CREW MEMBERS AND OPERATIONAL PERSONNEL

1. Checking – Flight crew members

- (1) Except as provided in subsections (3) and (5), each flight crew member shall successfully demonstrate his or her proficiency to a DFE or authorised person by undergoing a pilot proficiency check (PPC) on each type of aircraft operated –
- (a) upon completion of initial type rating flight training;
 - (b) every six months (IFR) or 12 months (VFR) following initial type rating flight training; and
 - (c) upon completion of upgrade training.
- (2) The PPC referred to in subsection (1) shall be completed as prescribed in Schedule One or Two of TS 93.03.8 as applicable to the type of aircraft operated and the operations conducted (IFR/VFR).
- (3) In addition, each flight crew member of a high performance aircraft shall successfully complete a line check following initial or upgrade training and annually thereafter. Such line check shall be completed by a DFE or testing officer and the results of the check recorded in the crew member's training records. A line check shall consist of an assessment of the flight crew member's ability to conduct safe operations over a variety of routes.
- (4) An operator may be permitted checking credits for different types or variants of aircraft based on the demonstrated similarities between the aircraft, hereinafter referred to as aircraft grouping. Notwithstanding approved aircraft grouping, the initial PPC or competency check shall be completed on each type of aircraft operated and the subsequent PPCs or competency checks shall be accomplished on a rotating basis between the aircraft involved. For the purposes of this TS and CAR 93.03.7(1)(a), a recurrent PPC or CC completed on one aircraft type shall be deemed to have been completed on all aircraft types for which aircraft grouping has been approved.
- (5) A record of each check completed as required by these TS shall be retained on the

flight crew member's training record.

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

2. Checking – Load Masters and Winch Operators

- (1) Upon completion of any initial and recurrent type training, each load master and winch operator shall successfully demonstrate his or her knowledge and proficiency through the completion of a theoretical and practical examination administered by the responsible person.
- (2) The Corporate Aviation operator shall establish the checking requirements following differences or familiarisation training which, in no case, shall be less than a knowledge test of the subject matter.
- (3) Upon successful completion of any theoretical or practical check, the person's training records shall be annotated to indicate such person's competence as a load master or winch operator, as appropriate.

3. Checking – Flight Operations Officers

- (1) Flight operations officers are subject to the following checking and certification requirements:
- (a) examinations shall be administered to each flight operations officer (FOO) trainee at least at the completion of each phase of training syllabus as appropriate to the type of training undertaken. A FOO trainee shall not progress to a higher level of training until he or she has achieved a passing grade on each examination. All examinations shall be to a depth that ensures a high degree of comprehension has been demonstrated and shall be administered following initial, transition, regaining qualifications or recurrent training;
- (b) for initial certification and thereafter on an annual basis, each FOO shall undergo a competency check. The applicant shall have successfully demonstrated the ability to:
- (i) make an accurate and operationally acceptable weather analysis from a series of daily weather maps and weather reports; provide an operationally valid briefing on weather conditions prevailing in the general neighbourhood of a specific air route; forecast weather trends pertinent to air transportation with particular reference to destination and alternates;
- (ii) determine the optimum flight path for a given segment, and create

accurate manual and/or computer generated flight plans;

- (iii) provide operating supervision and all other assistance to a flight in actual or simulated adverse weather conditions, as appropriate to the duties of the holder of a FOO certificate; and
- (iv) assist in accordance with established procedures in an emergency or overdue aircraft;
- (c) the FOO check report shall be retained on the FOO's training file; and
- (d) each FOO who has successfully completed the operator-specific training program shall receive a certificate of competency. Such certificate of competency shall be retained on the FOO's training file.

93.03.8 PILOT PROFICIENCY CHECKS (PPC)

AEROPLANES

SCHEDULE 1

PPC Criteria Using Full Flight Simulators

1. Pre-flight Phase

- (1) Flight planning and equipment examinations are not mandatory when there are, in the training records, written examinations from initial or annual training for which the validity period has not expired.
- (2) Flight planning shall include a practical examination on the crew's knowledge of operator's approved Standard Operating Procedures and the Aircraft Flight Manual including aircraft and runway performance charts, and weight and balance procedures.
- (3) The equipment examination shall consist of a display of practical knowledge of the airframe, engine, major components and systems including the normal, abnormal and emergency operating procedures and limitations relating thereto.

2. Flight Phase

- (1) Taxiing –
 - (a) the use of the taxiing check list; and
 - (b) taxiing in compliance with clearances and instructions issued by the person conducting the PPC;

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

(2) Engine Checks –

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

(3) Take-off

- (a) one normal take-off to be performed in accordance with the Aircraft Flight Manual;
- (b) an instrument take-off in the minimum visibility approved for the operator;
- (c) a take-off in a minimum of a 10kt crosswind component;

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

- (d) a take-off with failure of an engine at a speed greater than V1 and at an altitude of less than 50 feet AGL; or at a speed as close as possible to, but greater than V1 when V1 and V2, or V1 and Vr are identical, such engine to be the critical engine if the aeroplane concerned has a critical engine; and
- (e) a rejected take-off from a speed not less than 90% of the calculated V1 or as appropriate to the aeroplane type.

(4) Instrument Procedures –

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

- (a) an area departure and an area arrival procedure shall be performed where the crew –
 - (i) adheres to air traffic control clearances and instructions; and
 - (ii) properly uses the available navigation equipment and facilities;
- (b) a holding procedure;
- (c) at least two instrument approaches performed in accordance with procedures and limitations in the AIP or in the equivalent foreign publication, or approved company approach procedure for the facility used. One of the approaches

shall be a precision approach, and one a non-precision approach; and

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

(5) Manoeuvres –

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

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

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

- (i) the following approaches to stall configurations are required for initial and upgrade PPCs –
- (aa) one in the take-off configuration, except where a zero-flap take-off configuration is normally used in that model and type of aeroplane. In such case one stall should be demonstrated with the aeroplane configured for normal manoeuvring;
- (bb) one in a clean configuration; and
- (cc) one in a landing configuration; and
- (ii) on the approach to a stall demonstrated in the manoeuvring configuration the aeroplane shall be placed into a turn with a bank angle of between 15° and 30°.

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

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

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

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

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

(6) Landings and Approaches to Landings –

(a) one normal landing;

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

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

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

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

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

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

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

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

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

(i) where CAT II approaches are authorised in the Corporate Aviation Operator certificate or are requested to be performed, the following is required –

(aa) for a PIC initial qualification –

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

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

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

(ii) where both CAT II and CAT III approaches are authorised in the Corporate Aviation Operator certificate or the flight crew required to perform, the following is required for a PIC initial qualification –

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

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

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

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

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

(7) Normal Procedures –

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

(8) Abnormal and Emergency Procedures –

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

- (b) system malfunctions shall consist of a selection adequate to determine that the crew has satisfactory knowledge and ability to safely handle malfunctions; and
- (c) at least two simulated engine failures, excluding failures on the runway followed by a rejected take-off, at any time during the check.

(9) Airborne Manoeuvres –

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

- (a) interior and exterior aeroplane pre-flight checks;
- (b) ground handling for pilots-in-command;
- (c) normal take-off, visual circuit (where possible) and landing;
- (d) a simulated engine failure procedure after take-off (at safe altitude and airspeed);
- (e) a simulated engine inoperative landing; and
- (f) a normal missed approach.

SCHEDULE 2

PPC Criteria Using the Aeroplane Only

1. Pre-flight Phase

- (1) Flight Planning and Equipment Examination –
 - (a) flight planning and equipment examinations are not mandatory when there are, in the training records, written examinations from initial or annual training for which the validity period has not expired;
 - (b) flight planning shall include a practical examination on the pilot's knowledge of standard operating procedures and the Aircraft Flight Manual including performance charts, loading, weight and balance and Flight Manual Supplements; and

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

(2) Aeroplane Inspection

A pre-flight aeroplane inspection that includes –

- (a) a visual inspection of the exterior and interior of the aeroplane, locating each item to be inspected and explaining the purpose of the inspection;
- (b) the proper use of the pre-start, start and pre-taxi check lists; and
- (c) checks of the appropriate radio communications, navigation and electronic equipment and selection of the appropriate communications and navigation frequencies prior to flight.

2. Flight Phase

(1) Taxiing

- (a) taxiing procedures;
- (b) a taxiing check including –
 - (i) the use of the taxiing check list; and
 - (ii) taxiing in compliance with clearances and instructions issued by the appropriate air traffic control unit or by the person conducting the PPC; and
 - (iii) where a SIC is undergoing the PPC, the taxiing check outlined above to the extent practicable from the SIC position.

(2) Engine Checks

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

(3) Take-off

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

except that instrument flight rules are simulated at or before reaching an altitude of 200 feet above the airport elevation;

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

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

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

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

- (4) Instrument Procedures Instrument procedures shall consist of IFR pre-flight preparation, departure and en route procedures, terminal procedures and system malfunction –

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

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

- (ii) properly uses the available navigation facilities;

- (b) a holding procedure;

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

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

- (5) In Flight Manoeuvres –

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

- (b) approaches to stalls –

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

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

- (i) one in the take-off configuration, except where a zero-flap take-off configuration is normally used in that model and type of aeroplane. In such case one stall should be demonstrated with the aeroplane configured for normal manoeuvring;
 - (ii) one in a clean configuration; and
 - (iii) one in a landing configuration.
- (c) On the approach to a stall demonstrated in the manoeuvring configuration the aeroplane shall be placed into a turn with a bank angle of between 15° and 30°;
- (d) For the purpose of this manoeuvre the required recovery from a stall is initiated when there is a perceptible buffet or other alert of an impending stall entry.
- (e) When performed in an aeroplane the approach to stalls shall be conducted at an altitude of at least 5 000 feet AGL and if conducted above cloud at an altitude of at least 2 000 feet above the cloud tops.
- (6) Landings and Approaches to Landings –
- (a) one normal landing which shall, where practicable, be conducted without external or internal glideslope information;
 - (b) one landing from an instrument approach, and where prevailing conditions prevent an actual landing, an approach to a point where a landing could have been made;
 - (c) one cross wind landing where practicable under existing meteorological, airport and airport traffic conditions;
 - (d) one landing and manoeuvring to that landing with a simulated failure of 50 per cent of the available engines which shall be on one side of the aeroplane for the PIC and on outboard engine only for other than the PIC. Where the aeroplane type is a three engine aeroplane, the loss of power shall be an outboard engine and the centre engine for the PIC and on outboard engine for other than the PIC. For three- and four-engine aeroplanes the PIC is required to perform a two-engine inoperative procedure during initial qualification check

and annually thereafter; and

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

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

(7) Normal Procedures

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

(8) Abnormal and Emergency Procedures –

- (a) the crew shall demonstrate use of as many of the operator's approved Standard Operating Procedures and abnormal and emergency procedures for as many of the emergency situations as is necessary to confirm that the crew has an adequate knowledge and ability to perform these procedures;
- (b) system malfunctions shall consist of a selection adequate to determine that the crew has satisfactory knowledge and ability to safely handle malfunctions;
- (c) at least two simulated engine failures any time during the check shall be introduced.

HELICOPTERS

SCHEDULE 1

PPC Criteria Using Full Flight Simulators

Under Development

SCHEDULE 2

PPC Criteria Using the Helicopter Only

Under Development

93.04.2 OPERATIONS MANUAL (Applicable to Corporate Aviation Operators only)

1. Structure of operations manual

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

(2) A Corporate Aviation operator shall ensure that the main structure of the operations manual is as follows –

Part 1: General

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

Part 2: Aircraft operating matters

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

Part 3: Route and aerodrome instructions and information

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

Part 4: Training

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

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

(a) title page;

(b) table of contents;

(c) record of amendments page; and

- (d) list of effective pages.
- (4) A Corporate Aviation Operator must ensure that the detailed structure of the operations manual is approved by the Director.

2. CONTENTS OF OPERATIONS MANUAL

2.1 PART 1: GENERAL

2.1.1 Administration and control of operations manual

- (1) An operations manual shall contain certain statements and provisions for the manual administration and control and include at least the following:
 - (a) a statement that the manual is intended to comply with –
 - (i) all applicable acts, regulations and associated technical standards;
 - (ii) the terms and conditions of the Corporate Aviation Operating Certificate (CAOC); and
 - (iii) the authorisations, conditions and limitations of the operations specifications associated with the CAOC;
 - (b) a statement that, where any person is confronted with an operational situation not contemplated by the operations manual, such person will be expected to act in accordance with his or her most conservative discretion. Furthermore, where any part of the manual is considered to be repugnant to any provision referred to in sub-paragraph (a), such person shall comply with the respective legal statute and report the discrepancy to the responsible person by the quickest means possible;
 - (c) a statement that the manual contains operational instructions that are to be complied with by the relevant personnel;
 - (d) a list and brief description of the various parts, their contents, applicability and use (table of contents);
 - (e) explanations and definitions of terms and words needed for the use of the manual;
 - (f) where a manual system is in use by the operator, provisions for the issuance of each component in separate parts corresponding to specific aspects of the operation; and

(g) a brief description, by whatever means, of the operator's manual system that lists all operational and technical manuals developed or adopted by the operator for the purpose of ensuring operations personnel have been provided all information necessary for the performance of their duties. The means by which the description is provided shall indicate which manuals, or parts thereof, of the manual system will be available on board an aircraft during flight time.

(2) System of amendment and revision –

(a) who is responsible for the issuance and insertion of amendments and revisions;

(b) a record of amendments and revisions with insertion dates and effective dates;

(c) in the interests of aviation safety, a statement that provides for the rapid dissemination of operational information with a system of priorities governing the implementation process. Handwritten amendments and revisions are not permitted except in situations requiring immediate amendment or revision in the interests of aviation safety;

(d) a description of the system for the annotation of pages and their effective dates;

(e) a list of effective pages;

(f) annotation of changes (on text pages and, as far as practicable, on charts and diagrams);

(g) temporary revisions; and

(h) a description of the distribution system for the manuals, amendments and revisions.

2.1.2 Organisation and responsibilities

(1) Organisational structure

(a) For the purposes of this technical standard, the term “functional area” refers to a specific aspect of the corporate aviation operator's business, such as flight operations or maintenance, for which a person would normally be assigned the responsibility for its operation. In larger companies a functional area would be termed “division” or “department”.

(b) A description of the organisational structure through the use of one or more

organograms. The organogram(s) must depict the relationship between all functional areas related to the safety of operations (e.g. flight operations, maintenance, training, quality, safety and security), including their relationship to the chief executive officer. In particular, the subordination and reporting lines between the various post-holders shall be shown.

(2) Post-holders

The name, functions and responsibilities of each post-holder shall be listed.

(3) Responsibilities and duties of designated personnel

The specific responsibilities and duties delegated by a post-holder to certain personnel, within a functional area, shall be described.

(4) Authority, duties and responsibilities of the pilot-in-command (PIC)

The authority, duties and responsibilities of the PIC shall be defined.

(5) Duties and responsibilities of crew members other than the PIC

The duties and responsibilities of crew members, other than the PIC, shall be defined.

2.1.3 Operational control and supervision

(1) Supervision of the operation by the corporate aviation operator

The system for supervision of the operation by the corporate aviation operator shall be described. This must show how the safety of flight operations and the qualifications of personnel are supervised. In particular, the procedures related to the following items must be described –

(a) licence and qualification validity;

(b) competence of operations personnel; and

(c) control, analysis and storage of records, flight documents, additional information and data.

(2) System of promulgation of additional operational instructions and information

A system for promulgating information which may be of an operational nature but is supplementary to that in the operations manual shall be described. The applicability of this information and the responsibilities for its promulgation must be included.

(3) Operational control

The procedures and responsibilities necessary to exercise operational control with respect to flight safety shall be described.

2.1.4 Safety management system (SMS)

A description of the organisation of, roles and responsibilities of the personnel employed in, and policies and procedures associated with the safety management system. The description of the SMS may be contained in a separate manual depending upon the size and complexity of the corporate aviation operator.

For more information on the SMS, refer to Part 140.

2.1.5 Quality management system (QMS)

A description of the organisation of, roles and responsibilities of the personnel employed in, and policies and procedures associated with the QMS, which is normally integrated with the SMS. The description of the QMS may be contained in the SMS manual or a quality management manual (QMM) depending upon the size and complexity of the corporate aviation operator.

2.1.6 Flight crew composition

(1) Flight crew composition

An explanation of the method for determining flight crew compositions taking account of the following –

- (a) the type of aircraft, ie: fixed wing or helicopter, being used;
- (b) the area and type of operation being undertaken;
- (c) the phase of the flight;
- (d) the minimum flight crew requirement and flight duty period planned;
- (e) minimum flight time experience requirements, recency and qualification of the flight crew members; and
- (f) the designation of the PIC and, if necessitated by the duration of the flight, the procedures for the relief of the PIC or other members of the flight crew.

(2) Designation of the PIC

An explanation of the method established for designating one PIC for each flight.

(3) Flight crew incapacitation

A description of the succession of command in the event of flight crew member incapacitation shall be included.

2.1.7 Qualification requirements

- (1) A description of the required licence, rating(s), qualification/competency (e.g. for routes and aerodromes), experience, training, checking and recency for operations personnel to conduct their duties. Consideration must be given to the aircraft type, kind of operation and composition of the flight crew.
- (2) Flight deck crew
 - (a) Pilot-in-command;
 - (b) Second-in-command, if applicable;
 - (c) Pilot under supervision;
 - (d) Cruise relief pilot, if applicable; and
 - (e) Operation on more than one type or variant.
- (3) Cabin crew
 - (a) Senior cabin crew member
 - (b) Cabin crew member
 - (i) Required cabin crew member
 - (ii) Additional cabin crew member and cabin crew member during familiarisation flights.
 - (c) Operation on more than one type or variant.
- (4) Training, checking and supervision personnel
 - (a) For flight deck crew
 - (b) For cabin crew.
- (5) Other operations personnel.

2.1.8 Flight crew health precautions

Guidance to flight crew members concerning health including –

- (a) alcohol and other intoxicating liquor;
- (b) narcotics;
- (c) drugs;
- (d) sleeping tablets;
- (e) pharmaceutical preparations;
- (f) immunisation;
- (g) meal precautions prior to and during flight;
- (h) sleep and rest; and
- (i) surgical operations.

2.1.9 Flight time and duty period limitations

- (1) Flight time and duty period limitations and rest requirements

A description of the operator's approved flight time and duty period programme.

- (2) Provisions for exceeding flight time and duty period limitations and/or reductions of rest periods

Conditions under which flight time and duty periods may be exceeded or rest periods may be reduced and the procedures used to report these modifications.

2.1.10 Operating procedures

- (1) Flight preparation instructions

As applicable to the operation –

- (a) a description of the method of determination and application of minimum altitudes including –
- (i) a procedure to establish the minimum altitudes/flight levels for VFR flights; and
 - (ii) a procedure to establish the minimum altitudes/flight levels for IFR flights;
- (b) criteria for determining the usability of aerodromes;
- (c) the method for establishing aerodrome, and/or heliport, operating minima for IFR flights in accordance with TS 91.07.5 of document SA-CATS 91. Reference must be made to procedures for the determination of the visibility and/or runway visual range and for the applicability of the actual visibility, reported visibility and reported RVR.
- (d) en route operating minima for IFR and VFR flights or VFR portions of a flight and, where single-engine helicopters are used, instructions for route selection with respect to the availability of surfaces which permit a safe forced landing;
- (e) presentation and application of aerodrome and en route operating minima, including the increase of aerodrome operating minima in case of degradation of approach or aerodrome facilities;
- (f) interpretation of meteorological information, including explanatory material on the decoding of MET forecasts and MET reports relevant to the area of operations, including the interpretation of conditional expressions;

- (g) the methods by which the quantities of fuel, oil and water methanol to be carried, are determined and monitored in flight. This section must also include instructions on the measurement and distribution of the fluid carried on board. Such instructions must take account of all circumstances likely to be encountered on the flight, including the possibility of in-flight re-planning and of failure of one or more of the aircraft's power plants or loss of pressurisation. The system for maintaining fuel and oil records must also be described;
- (h) the general principles of mass and centre of gravity including –
 - (i) definitions;
 - (ii) methods, procedures and responsibilities for preparation and acceptance of mass and centre of gravity calculations;
 - (iii) the policy for using either standard and/or actual masses;
 - (iv) the method for determining the applicable passenger, baggage and cargo mass;
 - (v) the applicable passenger and baggage masses for various types of operations and aircraft type;
 - (vi) general instruction and information necessary for verification of the various types of mass and balance documentation in use;
 - (vii) last minute changes procedures;
 - (viii) specific gravity of fuel, oil and water methanol; and
 - (ix) seating policy/procedures;
- (i) procedures and responsibilities for the preparation and submission of the air traffic service flight plan. Factors to be considered include the means of submission for both individual and repetitive flight plans;
- (j) procedures and responsibilities for the preparation and acceptance of the operational flight plan. The content and use of the operational flight plan must be described;
- (k) the responsibilities and the use of the operator's flight folio must be described. A technical log may be used in place of a flight folio, if it contains the required information; and
- (l) list of documents, forms and additional information to be carried.

(2) Ground handling instructions

As applicable to the operation –

- (a) a description of fuelling procedures, including –
 - (i) safety precautions during refuelling and defuelling including when an

- APU is in operation or when a turbine engine is running and the prop-brakes are on;
- (ii) refuelling and defuelling when passengers are embarking, on board or disembarking; and
 - (iii) precautions to be taken to avoid mixing fuels;
- (b) a description of the handling procedures to be used when allocating seats and embarking and disembarking passengers and when loading and unloading the aircraft. Further procedures, aimed at achieving safety whilst the aircraft is on the apron, must also be given. Handling procedures must include –
- (i) disembarking of persons;
 - (ii) sick passengers and persons with reduced mobility;
 - (iii) transportation of inadmissible passengers, deportees or persons in custody;
 - (iv) permissible size and weight of hand baggage;
 - (v) loading and securing of items in the aircraft;
 - (vi) special loads and classification of load compartments;
 - (vii) positioning of ground equipment;
 - (viii) operation of aircraft doors;
 - (ix) safety on the apron, including fire prevention, blast and suction areas;
 - (x) start-up, apron departure and arrival procedures;
 - (xi) servicing of aircraft;
 - (xii) documents and forms for aircraft handling; and
 - (xiii) multiple occupancy of aircraft seats;
- (c) procedures to ensure that persons who appear to be intoxicated or who demonstrate by manner or physical indications that they are under the influence of drugs, except medical patients under proper care, are refused embarkation;
- (d) a description of the de-icing and anti-icing policy and procedures for aircraft on the ground. These must include descriptions of the types and effects of icing and other contaminants on aircraft whilst stationary during ground movements and during take-off. In addition, a description of the fluid types used must be given including –
- (i) proprietary or commercial names;
 - (ii) characteristics;
 - (iii) effects on aircraft performance;
 - (iv) hold-over times; and
 - (v) precautions during usage.
- (3) Flight procedures

As applicable to the corporate aviation operation –

- (a) a description of the policy for allowing flights to be made under VFR, or of requiring flights to be made under IFR, or of changing from one to the other;
- (b) a description of all navigation procedures relevant to the type(s) and area(s) of operation and equipment required to operate therein. Consideration shall be given to –
 - (i) standard navigation procedures including policy for carrying out independent cross-checks of navigation data entries;
 - (ii) RVSM as contemplated in Technical Standard 91.04.31 in Document SA-CATS 91;
 - (iii) RNP, MNPS and POLAR navigation and navigation in other designated areas;
 - (iv) RNAV;
 - (v) in-flight replanning; and
 - (vi) procedures in the event of system degradation;
- (c) circumstances in which a radio listening watch is maintained;
- (d) instructions on –
 - (i) the use of normal checklists and the timing of such use;
 - (ii) departure contingency procedures;
 - (iii) altimeter setting procedures;
 - (iv) altitude alerting system procedures;
 - (v) stabilised approach procedure and the limitation on high rates of descent near the surface;
 - (vi) the conduct of instrument approaches and the conditions required to commence or to continue an instrument approach;
 - (vii) CRM procedures at night or in IMC;
- (e) TAWS procedures;
- (f) policy and procedures for the use of ACAS;
- (g) policy and procedures for in-flight fuel management;
- (h) procedures for reporting, operating in and/or avoiding potentially hazardous atmospheric conditions including –
 - (i) thunderstorms;
 - (ii) icing conditions;
 - (iii) turbulence;
 - (iv) windshear;
 - (v) jetstreams;

- (vi) volcanic ash clouds;
 - (vii) heavy precipitation;
 - (viii) sand storms;
 - (ix) mountain waves; and
 - (x) significant temperature inversions;
- (i) wake turbulence separation criteria, taking into account aircraft types, wind conditions and runway location;
 - (j) procedures in the event that a decision to descend is taken while en route, covering –
 - (i) the necessity of giving the appropriate ATS unit prior warning of the situation and of obtaining a provisional descent clearance; and
 - (ii) the action to be taken in the event that communication with the ATS unit cannot be established or is interrupted.
 - (k) the requirements for flight crew members to occupy their assigned stations or seats during the different phases of flight or whenever deemed necessary in the interests of aviation safety;
 - (l) the requirements for flight crew members and passengers to use safety belts and/or harnesses during the different phases of flight or whenever deemed necessary in the interests of aviation safety;
 - (m) the conditions for the admission to the flight deck of persons other than the flight crew;
 - (n) the conditions and procedures for the use of vacant flight crew seats;
 - (o) procedures to be followed in the event of incapacitation of flight crew members in flight. Examples of the types of incapacitation and the means for recognising them, must be included;
 - (p) procedures covering –
 - (i) cabin preparation for flight, in-flight requirements and preparation for landing including procedures for securing cabin and galleys;
 - (ii) procedures to ensure that passengers are seated where, in the event that an emergency evacuation is required, they may best assist and not hinder evacuation from the aircraft;
 - (iii) procedures to be followed during passenger embarkation and disembarkation;

- (iv) procedures in the event of fuelling with passengers on board or embarking and disembarking; and
 - (v) smoking on board;
 - (g) the contents, means and timing of passenger briefing in accordance with CAR 93.07.27;
 - (r) lists of the survival and emergency equipment required for each route or area of operation and the procedures to ensure such equipment has been inspected and/or is functioning properly prior to departure;
 - (s) information and instructions relating to the interception of civil aircraft including
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 - (i) procedures for pilots-in-command of intercepted aircraft; and
 - (ii) visual signals for use by intercepting and intercepted aircraft; and
 - (t) procedures for the use of head-up displays (HUD), enhanced vision systems (EVS) and night vision goggles, as applicable
 - (u) if applicable to the aeroplane being operated, procedures for the use of required cosmic or solar radiation detection equipment and for recording its readings including actions to be taken in the event that limit values specified in the operations manual are exceeded.
- (4) All weather operations
 - (5) EDTO procedures, including engine failure procedures and the nomination of alternate aerodromes
 - (6) Use of the minimum equipment and configuration deviation list(s)
 - (7) Development and use of standard operating procedures (SOPs) whether stand alone or as part of an aircraft operating manual.
 - (8) Procedures and limitations for –
 - (a) training flights;
 - (b) test flights;
 - (c) delivery flights;
 - (d) ferry flights;

(e) demonstration flights; and

(f) positioning flights,

including the kind of persons who may be carried on such flights.

(9) Oxygen requirements

(a) An explanation of the conditions under which oxygen must be provided and used.

(b) The oxygen requirements specified for –

(i) flight deck crew;

(ii) Cabin crew; and

(iii) passengers.

2.1.11 Dangerous goods and weapons

(1) If applicable, information, instructions and general guidance on the conveyance of dangerous goods including –

(a) operator's policy on the conveyance of dangerous goods;

(b) guidance on the requirements for acceptance, labelling, handling, stowage and segregation of dangerous goods;

(c) procedures for responding to emergency situations involving dangerous goods;

(d) duties of all personnel involved in the conveyance of dangerous goods as referred to in a Part 92;

(2) The conditions under which weapons, munitions of war and sporting weapons may be carried.

(3) For operators not authorised to convey dangerous goods, policies and procedures to create an awareness of dangerous goods.

2.1.12 Security

(1) Security instructions and guidance of a non-confidential nature which must include the authority and responsibilities of operations personnel. Policies and procedures for handling and reporting crime on board such as unlawful interference, sabotage,

bomb threats and hijacking must also be included.

- (2) A Corporate Aviation Operator shall publish an on-board means of establishing and communicating discrete signals between crew members as a defence against air piracy without providing specific information with respect to the actual discrete communications.
- (3) A description of preventative security measures and training.

Note – Parts of the security instructions and guidance may be kept confidential.

2.1.13 Handling of aviation accidents and incidents

Procedures for the handling, notifying and reporting of aviation accidents and incidents shall be described. This section must include –

- (a) definitions of aviation accidents and incidents and the relevant responsibilities of all persons involved;
- (b) a description of which corporate aviation operator departments, authorities or other institutions have to be notified and by which means and in which sequence in case of an aviation accident;
- (c) special notification requirements in the event of an aviation accident or incident when dangerous goods are being carried;
- (d) a description of the requirements to report specific aviation accidents and incidents;
- (e) the forms used for reporting and the procedure for submitting them to the relevant authority must also be included; and
- (f) if the corporate aviation operator develops additional safety related reporting procedures for its own internal use, a description of the applicability and related forms to be used.

2.1.14 Rules of the air

Rules of the air including:

- (a) visual and instrument flight rules;
- (b) territorial application of the rules of the air;
- (c) communication procedures including COM-failure procedures;
- (d) information and instructions relating to the interception of civil aircraft;
- (e) the circumstances in which a radio listening watch is to be maintained;

- (f) signals;
- (g) time system used in operation;
- (h) ATC clearances, adherence to flight plan and position reports;
- (i) visual signals used to warn an unauthorised aircraft flying in or about to enter a restricted, prohibited or danger area;
- (j) procedures for pilots observing an aviation accident or receiving a distress transmission;
- (k) the ground/air visual codes for use by survivors, description and use of signal aids; and
- (l) distress and urgency signals.

2.2 PART 2: AIRCRAFT OPERATING MATTERS – TYPE RELATED

Taking account of the differences between types and variants of types under the following headings –

2.2.1 General information and units of measurement

General information (e.g. aircraft dimensions), including a description of the units of measurement used for the operation of the aircraft type concerned and conversion tables.

2.2.2 Limitations

A description of the certified limitations and the applicable operational limitations including –

- (a) certification status;
- (b) passenger seating configuration for each aircraft type including a pictorial presentation;
- (c) types of operation that are approved (e.g. IFR/VFR, CAT II/III, flights in known icing conditions, etc.);
- (d) flight crew composition;
- (e) mass and centre of gravity;
- (f) speed limitations;
- (g) flight envelope(s);
- (h) wind limits including operations on contaminated runways;
- (i) performance limitations for applicable configurations;

- (j) runway slope;
- (k) limitations on wet or contaminated runways;
- (l) airframe contamination; and
- (m) system limitations.

2.2.3 Normal procedures

The normal procedures and duties assigned to the flight crew and the appropriate check-lists and the system for use of the checklists. The following normal procedures and duties must be included –

- (a) pre-flight;
- (b) pre-departure;
- (c) altimeter setting and checking;
- (d) taxi, take-off and climb;
- (e) noise abatement;
- (f) cruise and descent;
- (g) approach, landing preparation and briefing;
- (h) VFR/VMC approach;
- (i) instrument approach;
- (j) visual approach and circling;
- (k) missed approach;
- (l) normal landing;
- (m) post landing; and
- (n) operation on wet and contaminated runways.

2.2.4 Abnormal, emergency and supplementary procedures

The abnormal and emergency procedures and duties assigned to the flight crew, the appropriate check-lists, the system for use of the check-lists and a statement covering the necessary co-ordination procedures between flight crew and cabin crew. The following abnormal and emergency procedures and duties shall, if applicable, be included:

- (a) flight crew incapacitation;
- (b) fire and smoke drills;
- (c) unpressurised and partially pressurised flight;
- (d) exceeding structural limits such as overweight landing;
- (e) exceeding cosmic radiation limits;
- (f) lightning strikes;
- (g) distress communications and alerting ATC to emergencies;
- (h) engine failure;

- (i) system failures;
- (j) guidance for diversion in case of serious technical failure;
- (k) ground proximity warning;
- (l) ACAS warning;
- (m) windshear;
- (n) emergency landing/ditching; and
- (o) emergency evacuation.

2.2.5 Performance

- (1) Performance data must be provided in a form in which it can be used without difficulty.
- (2) Performance material which provides the necessary data for compliance with the performance requirements prescribed in Subpart 8 of this Part must be included to allow the determination of –
 - (a) maximum crosswind and tailwind components and the reductions to be applied to these values having regard to gusts, low visibility, runway surface conditions, crew experience, abnormal or emergency circumstances or any other relevant operational factors;
 - (b) take-off climb limits – mass, altitude, temperature;
 - (c) take-off field length (dry, wet, contaminated);
 - (d) net flight path data for obstacle clearance calculation or, where applicable, take-off flight path;
 - (e) the gradient losses for banked climb-outs;
 - (f) en route climb limits;
 - (g) approach climb limits;
 - (h) landing climb limits;
 - (i) landing field length (dry, wet, contaminated) including the effects of an in-flight failure of a system or device, if it affects the landing distance;
 - (j) brake energy limits; and
 - (k) speeds applicable for the various flight stages (also considering wet or contaminated runways).
- (3) Supplementary data covering flights in icing conditions, in consideration of –

- (a) any certificated performance related to an allowable configuration, or configuration deviation, such as anti-skid inoperative, must be included; and
 - (b) if performance data, as required for the appropriate performance class, is not available in the approved AFM, then other data acceptable to the Director must be included. Alternatively, the operations manual may contain cross-reference to the approved data contained in the AFM where such data is not likely to be used often or in an emergency.
- (4) Additional aeroplane performance data, where applicable, including –
- (a) all engine climb gradients;
 - (b) drift-down data;
 - (c) effect of de-icing/anti-icing fluids;
 - (d) flight with landing gear down;
 - (e) for aeroplanes with 3 or more engines, one engine inoperative ferry flights; and
 - (f) flights conducted under the provisions of the CDL.
- (5) Additional helicopter performance data, where applicable, including:
- (a) effect of equipment on level flight (fuel consumption, speed and range), including:
 - (i) hoist installation;
 - (ii) sliding doors, whether open or closed;
 - (iii) ski installation;
 - (iv) float installation;
 - (v) emergency float installation; and
 - (vi) sand filter installation; and
 - (b) effects on flights conducted under the provisions of the CDL.

2.2.6 Flight planning

- (1) Data and instructions necessary for pre-flight and in-flight planning, including factors

such as speed schedules and power settings. Where applicable, procedures for engine(s)-out operations, EDTO and flights to isolated aerodromes must be included.

- (2) The method for calculating fuel needed for the various stages of flight in accordance with CAR 91.07.12.

2.2.7 Mass and balance

Instructions and data for the calculation of the mass and balance including –

- (a) calculation system (e.g. index system);
- (b) information and instructions for completion of mass and balance documentation, including manual and computer generated types;
- (c) limiting masses and centre of gravity of the various versions; and
- (d) dry operating mass and corresponding centre of gravity or index.

2.2.8 Loading

The procedures and provisions for loading and securing the load in the aircraft shall be described.

2.2.9 Configuration deviation list (CDL), if applicable

The company approved procedures for the use of a CDL, if provided by the manufacturer, taking account of the aircraft types and variants operated including procedures to be followed when an aircraft is being dispatched under the terms of its CDL.

2.2.10 Minimum equipment list (MEL)

The company procedures for the use of an approved MEL taking account of the aircraft types and variants operated and the type(s)/area(s) of the corporate aviation operation.

2.2.11 Survival and emergency equipment including oxygen

- (1) A list of the survival equipment to be carried for the routes to be flown and the procedures for checking the serviceability of this equipment prior to take-off. Instructions regarding the location, accessibility and use of survival and emergency equipment and its associated check lists(s) must also be included.
- (2) The procedure for determining the amount of oxygen required and the quantity that is available. The flight profile, number of occupants and possible cabin decompression

must be considered. The information provided must be in a form in which it can be used without difficulty.

2.2.12 Emergency evacuation procedures

- (1) Instructions for preparation for emergency evacuation including flight crew co-ordination and emergency station assignment.
- (2) A description of the duties of all members of the flight crew for the rapid evacuation of an aircraft and the handling of the passengers in the event of a forced landing, rejected take-off, ditching or other emergency.

2.2.13 Aircraft systems

A description of the aircraft systems, related controls and indications and operating instructions shall be included.

2.3 PART 3: ROUTE AND AERODROME INSTRUCTIONS AND INFORMATION

Instructions and information relating to communications, navigation and aerodromes including minimum flight levels and altitudes for each route to be flown and operating minima for each aerodrome planned to be used, including –

- (a) minimum flight level/altitude;
- (b) operating minima for departure, destination and alternate aerodromes;
- (c) communication facilities and navigation aids;
- (d) runway/landing site data and aerodrome facilities;
- (e) approach, missed approach and departure procedures including noise abatement procedures;
- (f) COM-failure procedures;
- (g) search and rescue facilities in the area over which the aircraft is to be flown;
- (h) a description of the aeronautical charts that must be carried on board in relation to the type of flight and the route to be flown, including the method to check their validity;
- (i) availability of aeronautical information and MET services;
- (j) en route COM/NAV procedures including holding; and

- (k) aerodrome categorisation for flight crew competence and qualifications.

2.4 PART 4: TRAINING

- (1) Training syllabi and checking programmes for all flight crew members and operations personnel other than flight crew members who are assigned to duties in connection with the preparation and/or conduct of a flight.
- (2) Training syllabi and checking programmes shall include –
- (a) for flight crew members, all relevant items prescribed in Part 61 and Subpart 3 of this Part;
 - (b) for cabin crew, all relevant items prescribed in Part 64 and Subpart 3 of Part 93; and
 - (c) for operations personnel concerned, including flight crew members:
 - (i) all relevant items prescribed in Part 92; and
 - (ii) all relevant items regarding operator security
 - (d) for operations personnel other than flight crew members, all relevant items pertaining to their duties as specified in Subpart 3 of this Part.
- (3) Procedures –
- (a) for training and checking;
 - (b) to be applied in the event that personnel do not achieve or maintain the required standards; and
 - (c) to ensure that abnormal or emergency situations requiring the application of part or all of abnormal or emergency procedures and simulation of IMC by artificial means, are not simulated during corporate aviation flights.
- (4) Description of documentation to be retained and the storage periods.

93.04.4 OPERATIONAL FLIGHT PLAN

1. Types of operational flight plans

- (1) Although each flight must be released in accordance with the provisions of an OFP/flight release, the actual OFP should be appropriate to the type of flight being undertaken.

- (2) A Corporate Aviation Operator must publish in its operations manual a description, whether computer or manually generated, of the different OFPs used by the operator and include instructions as to the preparation, acceptance, flight and ground management of the OFP and the procedures for retention.
- (3) The contents of an OFP are based on the different types of flights undertaken under this Part. Accordingly –
- (a) a full OFP as specified in section 2(1) is required for –
 - (i) all international flight operations; and
 - (ii) IFR operations;
 - (b) an OFP consisting of at least those items indicated by a single asterisk in section 2(1) is required for helicopters on VFR or IFR short positioning flights and day or night VFR aeroplane operations using –
 - (i) multi-engine aeroplanes; and
 - (ii) single-engine aeroplanes with a maximum certificated passenger seating in excess of nine;
 - (c) an OFP consisting of at least those items listed in section 2(2) may, in lieu of the OFP prescribed in paragraph (3)(a) or (3)(b), as applicable, be used when conducting a series of flights, that meet the following criteria –
 - (i) the series of flights shall not result in flight time longer than 90 minutes in total;
 - (ii) no individual sector shall be longer than 30 minutes; and
 - (iii) the time spent on the ground at each en route stop shall not exceed 30 minutes; and
 - (d) an informal OFP, being either an ATC flight plan or equivalent record, is required for day or night VFR operations using single-engine aircraft with a maximum certificated passenger seating of 9 or less.
- (4) The format of the full OFP shall allow the crew to record the fuel state and the progress of the flight relative to the plan. The OFP may be computer-generated or produced manually, working from charts and tables, by either the FOO or the flight crew. When an OFP is prepared manually, an approved form displaying the requisite information and providing the necessary space to make flight following entries as the flight progresses shall be used.

- (5) A Corporate Aviation Operator shall specify in its operations manual how formal acceptance of the OFP by the PIC and the FOO shall be recorded.

2. Operational flight plans

- (1) The minimum required content of an OFP is as follows but each field shall be considered as applicable to the type of flight, the type of aircraft and the type of operational control system (OCS) to which the OFP applies –

Note – Asterisks by an item indicate information required for the OFP specified in section 1(3) of this TS.

- (a) *operator's name;
- (b) *date and ETD at points of departure and ETA at destinations;
- (c) *aircraft registration or aircraft tail number, as applicable;
- (d) aircraft type and model or variant, as applicable;
- (e) *flight number, as applicable;
- (f) *flight crew members' names and, unless recorded elsewhere, assigned position;
- (g) *flight operations officer's name if flight is not pilot self-dispatch;
- (h) *number of cabin crew and passengers on board, as amended by final load figures, unless recorded elsewhere;
- (i) *departure aerodrome;
- (j) *destination aerodrome;
- (k) alternate aerodrome, as applicable, including en route alternates where required;
- (l) routing to destination by successive navigational way points, including associated tracks and distances for each;
- (m) routing to alternate aerodrome, including associated tracks and distances, if applicable;
- (n) specification of any way points en route to satisfy special operations

requirements (EDTO, etc.):

- (o) planned cruise altitudes to destination and alternate, as applicable, and minimum safe altitudes along planned routes;
- (p) planned cruise indicated air speed or mach number, as applicable, true air speed and ground speed or wind component during cruise;
- (q) winds at planned cruise altitude (expressed in terms of direction/velocity or as a component/drift angle);
- (r) *estimated time en route (if broken down into way point time components, a total shall be specified);
- (s) time from destination to alternate, as applicable;
- (t) distance to destination (if broken down into way point distance components, a total shall be specified);
- (u) distance from destination to alternate, as applicable;
- (v) fuel burn en route and from destination to alternate;
- (w) record of in-flight fuel checks completed in accordance with CAR 93.07.17;
- (x) *fuel computation breakdown required for the type of flight plan for, as applicable, –
 - (i) taxi;
 - (ii) *destination;
 - (iii) alternate;
 - (iv) holding reserve;
 - (v) en route reserve, as applicable;
 - (vi) *contingency fuel, as applicable; and
 - (vii) *the fuel on board when starting engines (entered by flight crew), unless recorded elsewhere; and
 - (viii) *mass and balance showing –

- (aa) *total planned fuel on board;
 - (bb) zero fuel weight; and
 - (cc) *planned maximum take-off weight and C of G location or trim position, as applicable.
 - (ix) *signature of pilot-in-command and the flight operations officer (FOO), as applicable, or alternate means of certifying acceptance
- (2) The minimum required content of an OFP used for a series of flights as prescribed in section 1(3)(c) is as follows –
- (a) operator's name;
 - (b) date;
 - (c) aircraft registration or aircraft tail number, as applicable;
 - (d) aircraft type and model or variant, as applicable;

93.04.6 TRAINING RECORDS

1. Training records

- (1) The training file referred to in CAR 93.04.6, shall include a record of -
- (a) the person's name and, where applicable, personnel licence number, type and ratings or validation of foreign licence, if applicable;
 - (b) if applicable, the person's medical category and the expiry date of that category;
 - (c) the dates of the most recent successful completion of any training, pilot proficiency check (PPC) or competency check (CC), examination or other crew member skills test required in terms of CAR Subpart 3 or obtained any qualification required in terms of Part 61 or this TS;
 - (d) the report of any check or skills test completed;
 - (e) information relating to any failure of the person, to successfully complete any training, PPC or examination required in terms of CAR Subpart 3 or to obtain any qualification required in terms of Part 61 or this TS;
 - (f) the type of aircraft or flight training equipment used for any training, PPC, line check or qualification required under this technical standard; and

- (g) any certificate required to be kept in terms of CAR Subpart 3
- (h) The most recent written examination completed for each type of aircraft for which the person has a qualification.
- (2) A Corporate Aviation Operator shall maintain a system for recording the qualifications and training of instructional and examining staff, as appropriate.
- (3) An operator shall retain the records referred to in paragraphs (1)(c) and (d) and a record of each PPC for at least three years.
- (4) An operator shall retain any certificate referred to in paragraph (1)(g) for at least 90 days beyond the duration of its validity period.

93.04.7 LOAD AND TRIM SHEET

1. Load and trim sheet

- (1) The load and trim sheet must contain the following information:
 - (a) The aircraft registration and type;
 - (b) the flight identification number and date;
 - (c) the identity of the pilot-in-command;
 - (d) the identity of the person who prepared the document;
 - (e) the dry operating mass and the corresponding CG of the aircraft;
 - (f) the mass of the fuel at take-off and the mass of trip fuel;
 - (g) the mass of consumables other than fuel;
 - (h) the components of the load including passengers, baggage, freight and ballast;
 - (i) the take-off mass, landing mass and zero fuel mass;
 - (j) the load distribution;
 - (k) the applicable aircraft CG positions; and
 - (l) the limiting mass and CG values.

- (2) The person superintending the loading of an aircraft must certify that the load distribution is in accordance with the requirements prescribed in the operations manual or flight manual and that the maximum certificated mass has not been exceeded.
- (3) The load and trim sheet must be signed by the pilot-in-command (PIC) prior to departure unless the load and trim sheet is sent to the aircraft by electronic data transfer, in which case the PIC shall ensure it has been reviewed and he or she is satisfied the flight is safe for departure.
- (4) The means by which the PIC certifies acceptance of the load and trim sheet shall be published in the operations manual (CAOC holders only).
- (5) A copy of the final load and trim sheet, as accepted by the pilot-in-command, must be available at a location on the ground as determined by the PIC.

93.06.3 APPLICATION FOR THE ISSUANCE OR AMENDMENT OF A CAOC AND OPERATIONS SPECIFICATIONS

1. Application for a CAOC

- (1) The form and manner referred to in CAR 93, Subpart 6 in which application is made for the issuance or amendment of a corporate aviation operator certificate (CAOC) or operations specifications is referred to in this TS as the certification process. This process is designed to address the following certification actions –
 - (a) initial certification of a corporate aviation operator in terms of this Part;
 - (b) revision to any existing CAOC or operations specification (OpSpec) issued in terms of this Part;
 - (c) corrective certification action of an existing CAOC or OpSpec where deficiencies have been discovered through the continuing safety oversight program, or where appropriate; or
 - (d) any other certification action requested by an operator, operating or desiring to operate in terms of this Part.

- (2) To assist in the processes, technical guidance material (TGM), outlining the means of meeting the certification requirements, has been developed. This guidance material and personal consultation is obtainable from SACAA.
- (3) The process used to accomplish any certification activity entails the applicant successfully completing the five phases of certification. An application may not progress where any phase is not completed satisfactorily. On this issue an applicant is cautioned of the need to review the deficiencies as prescribed in CAR 93.06.4(3). The five phases of certification are comprised of –
- (a) the pre-application phase;
 - (b) the formal application phase;
 - (c) the documentation review phase;
 - (d) the demonstration and inspection phase; and
 - (e) the certification phase.

Note – The certification TGM provides the details of each phase.

- (4) As part of the certification process an applicant shall complete and submit the following as a minimum –
- (a) for corporate aviation operators intending to operate internationally, a statement of compliance (SOC) document, as specified in sub-regulation (6), which is the means by which the operator ensures him or herself and the Director that the company will comply with all applicable regulatory requirements;
- Note** – See paragraph (6) for more information on the SOC.
- (b) a number of application forms, depending upon the type of authority being applied for, which are intended to provide evidence of qualification for the specific authorities requested. The number and type of forms required vary with the size, scope and complexity of the proposed operation and are at the discretion of the certification officer; however, all will be made available to the applicant;
 - (c) copies of all required manuals, as applicable; and
 - (d) payment of the application fee required by CAR 93.06.3(1) shall be non-refundable unless otherwise approved by the Director.

- (5) The applicant must submit to any inquiry or investigation, referred to in CAR 93.06.4(1), as deemed necessary in support of the application and to the certification audit referred to in CAR 93.06.5.
- (6) With respect to the SOC, for each applicant –
- (a) a SOC is required when applying for international authority;
 - (b) the SOC shall state that the corporate aviation operator will comply to all parts of the regulations, including technical standards, as applicable to the operation proposed, through reference to the operator's operations manual, maintenance or other required manuals;
 - (c) the SOC shall be updated by corporate aviation operators to reflect amended regulatory requirements or if amendments to the operations manual result in alternative means of compliance; and
 - (d) the Director may require the completion of a SOC by any corporate aviation operator at any time deemed necessary in the interest of public safety.

2. Required management positions (CAOC holders only)

- (1) A corporate aviation operator shall employ its chief executive officer and person responsible for flight operations on a full time basis to ensure proper control and supervision of its personnel and operation. An operator may employ on a full time basis or contract the remaining managers as listed in CAR 93.06.3(5); however, if contracted, they shall devote sufficient time to the operator to ensure they can adequately discharge their duties. The operator shall designate the functions to be fulfilled by each of its managers. Section 3 of this TS states the minimum qualifications and responsibilities of the incumbents. The responsibilities listed in section 3 for the incumbent of any position may be assigned to another position as provided in subsection (3).
- (2) The application forms for the required managerial positions will be reviewed to ensure the minimum qualifications are met. The assessment process may involve the use of quizzes or interviews to establish the suitability of each nominee. Where a nominee is known within SACAA, the Director may approve such nominee without the need for further assessment.

- (3) A corporate aviation operator may use whatever title deemed necessary for its managers and may assign some of the responsibilities for a given position to another person or persons or the responsibilities of more than one position to one person; however, all the responsibilities noted in section 3 shall be assigned to a nominated manager and such assignment clearly identified in the operations manual. Furthermore, every person assigned any responsibility associated with a required position shall also meet the qualification requirements associated with the responsibilities assigned.
- (4) A corporate aviation operator shall develop a method of ensuring that, in the absence of a responsible manager for any reason, all the responsibilities of that manager are assigned to another individual. Such individual shall meet the qualifications required for the responsibilities assigned except that the knowledge requirements may be demonstrated to the operator rather than the Director. Any assignment issued for a period greater than 30 days must be acceptable to the Director.

3. Approved positions, minimum qualifications and responsibilities (CAOC holders only)

(1) Chief Executive Officer (CEO)

(a) Qualifications

The CEO shall not have had any conviction or administrative sanction under the Act or these Regulations which, in the view of the Director, was sufficiently serious to render such person not fit and proper to exercise the responsibilities of such position.

(b) Responsibilities

The CEO shall –

- (i) have full authority for all human resources;
- (ii) have authority for major financial decisions;
- (iii) have direct responsibility for the conduct of the company's affairs; and
- (iv) have final responsibility for all safety and security issues.

(2) Person Responsible for Flight Operations (PRFO)

(a) Qualifications

The PRFO shall, as a minimum –

- (i) demonstrate adequate knowledge of the operation of the corporate aviation operator's aircraft;
- (ii) have acceptable oversight experience in a flight operations department or acceptable alternative experience;
- (iii) demonstrate knowledge to the Director of the content of the operations manual, the operator's corporate aviation operating certificate and operations specifications, as well as those provisions of the regulations and technical standards necessary to carry out his or her duties and responsibilities to ensure safety; and
- (iv) not have had any conviction or administrative sanction under the Act or these Regulations which, in the view of the Director, was sufficiently serious to render such person not fit and proper to exercise the responsibilities of such position.

(b) Responsibilities

The PRFO is responsible for safe flight operations, in particular –

- (i) the control of operations and operational standards of all aircraft operated;
- (ii) the identification of operations co-ordination functions which impact on operational control (e.g. maintenance, crew scheduling, load control, equipment scheduling);
- (iii) the supervision, organisation, manning and efficiency of the following –
 - (aa) flight operations;
 - (bb) cabin safety;
 - (cc) crew scheduling and rostering; and
 - (dd) training programmes;
- (iv) the timely resolution of safety issues;
- (v) the contents of the operations manual;

- (vi) the supervision of and the production and amendment of the operations manual;
- (vii) liaison with the regulatory authority on all matters concerning flight operations, including any variations to the operator's CAOC;
- (viii) liaison with any external agencies which may affect the operator's operations;
- (ix) ensuring that the operator's operations are conducted in accordance with current regulations, standards and the operator's policy;
- (x) ensuring that crew scheduling complies with flight and duty time regulations and that all crew members are kept informed of any changes to the regulations and standards;
- (xi) the receipt and actioning of any aeronautical information affecting the safety of flight;
- (xii) the dissemination of aircraft safety information, both internal and external, in conjunction with the safety management system;
- (xiii) the qualifications of flight crews;
- (xiv) the processing and actioning of any flight crew reports;
- (xv) the supervision of flight crews;
- (xvi) developing standard operating procedures and/or an aircraft operating manual;
- (xvii) developing and/or implementing all required approved training programmes for the operator's flight crews;
- (xviii) issuing directives and notices to the flight crews as required;
- (xix) the operational suitability and requirements of all aerodromes and routes served;
- (xx) ensuring the flight documents required by CAR 93.04.1 are retained for the period specified therein; and
- (xxi) the maintenance of a current operations library.

(3) Person Responsible for Aircraft (PRA)

(a) Qualifications

The PRA shall, as a minimum –

- (i) have or have held an aircraft maintenance engineer (AME) licence, issued in terms of Part 66, or –
 - (aa) at least have training and experience that may qualify the individual to obtain an AME licence; or
 - (bb) hold or have held a pilot licence and ratings appropriate to the aircraft being operated or demonstrate adequate knowledge of the maintenance of such aircraft; or
 - (cc) hold an engineering degree in aeronautics, electrical, mechanical or avionics or other studies relevant to aircraft maintenance with 5 years' experience in the aviation domain after obtaining that qualification;
 - (ii) have at least two years' experience in an executive position within aviation, or at least as a Quality Manager within the aviation domain;
 - (iii) have worked directly with the SACAA for at least one year and have not been the Quality Manager of the assigned maintenance organisation; and
 - (iv) within the preceding 5 years, have not held a similar position at any different aviation-related organisation where the approval issued by the Director has been suspended or cancelled by the Director or the Minister as a result of the organisation failing to comply with the requirements of the Act or the Regulations.
- (b) Responsibilities

The PRA is responsible for safe aircraft operations, in particular –

- (i) is responsible for all maintenance and inspection personnel and signing of Part D of the operations specifications;
- (ii) ensures that company aircraft are maintained in an airworthy condition;
- (iii) ensures that all inspections, repairs and component changes are accomplished in accordance with manufacturer's approved procedures;
- (iv) ensures compliance with maintenance procedures, airworthiness directives, service bulletins, service letters and the regulations;
- (v) ensures all maintenance technicians are trained and current on the types of aircraft for which approved;

- (vi) ensures that all maintenance technicians are certified and supervised according to the requirements specified in the regulations;
- (vii) the production and amendment of the policy and procedures manual or maintenance control manual, as appropriate;
- (viii) co-ordinates with maintenance contracting agencies when maintenance activities are being performed on company aircraft;
- (ix) provides the relevant personnel with the current airworthiness status of the aircraft and the forecast down times to facilitate maintenance scheduling and insure timely deferral or correction of aircraft discrepancies;
- (x) maintains a close liaison with manufacturer's representatives, parts supply houses, repair facilities and the SACAA;
- (xi) makes available to maintenance personnel the necessary overhaul manuals, service bulletins, service letters, airworthiness directives, applicable sections of the MCM/MPM and any other required technical data;
- (xii) maintains all necessary work records and logbooks, including certification in the aircraft permanent maintenance records that the aircraft is approved for return to service;
- (xiii) maintains the mass and balance records for all aircraft; and
- (xiv) completes all required reports and submits them to the PRFO for forwarding to the SACAA.

(4) Air Safety Officer (ASO)

(a) Qualifications

The ASO shall, as a minimum, have –

- (i) broad operational knowledge in the functions of the organisation or similar type of organisation;
- (ii) completed an approved safety management system (SMS) course in accordance with the syllabus prescribed in Technical Standard 93.10.1;
- (iii) at least 2 years of experience closely involved in the management of an aviation safety programme, SMS or quality assurance programme;

(b) Responsibilities

The ASO is responsible for the corporate aviation operator's SMS and in particular –

- (i) the establishment and maintenance of a reporting system to ensure the timely collection of information related to potential hazards, incidents and accidents that may adversely affect safety;
- (ii) the identification of latent hazards and carry out risk management analyses of those hazards;
- (iii) the investigation, analysis and identification of the root cause of all hazards or the contributing factors of incidents and accidents identified under the SMS to ensure the operator has adequate mitigation in place;
- (iv) the establishment and maintenance of a safety data system, either by electronic or by other means, to monitor and analyse trends in hazards, incidents and accidents;
- (v) the maintenance of a continuous monitoring system that evaluates the results of corrective actions with respect to hazards, incidents and accidents;
- (vi) the monitoring of the concerns of the civil aviation industry in respect of safety and their perceived effect on the operator;
- (vii) the co-ordination of the organisation's aviation safety programme and all related safety matters;
- (viii) co-operation with the training section with regard to safety training of flight, cabin and ground crews, as applicable;
- (ix) the supervision of aircraft handling regarding matters related to safety in co-operation with ground support services;
- (x) the investigation of all incidents and accidents involving the organisation's aircraft, equipment and property, including fire and emergency procedures, not undertaken in accordance with Part 12;
- (xi) the actioning and distribution of accident, incident and other occurrence reports;
- (xii) the co-ordination with security personnel to ensure all aspects of security regarding the organisation's aircraft;
- (xiii) the development and maintenance of a mandatory occurrence reporting scheme;
- (xiv) the establishment of an emergency response plan in the event of an accident, which includes the actions to be followed by relevant personnel;

- (xv) in concert with the person responsible for quality, the maintenance of a quality assurance programme within the organisation; and
- (xvi) the realisation of other duties which include –
 - (aa) promulgation of flight safety bulletins to all staff within the organisation;
 - (bb) conducting meetings with all relevant personnel regarding safety matters;
 - (cc) maintenance of safety equipment;
 - (dd) safety audits; and
 - (ee) occupational health and safety.

(5) Quality Manager (QM)

(a) Qualifications

The QM shall, as a minimum, have –

- (i) Grade 12 school level (Matric);
- (ii) certificate/s or diploma in quality management; and
- (iii) at least five years' experience in implementation and maintenance of QM systems.

(b) Responsibilities

The QM is responsible for ensuring that the corporate aviation operator's quality assurance programme is properly established, implemented and maintained and in particular –

- (i) the monitoring of compliance with, and the adequacy of, the procedures required to ensure safe operational practices and airworthy aircraft;
- (ii) the monitoring of activity in flight operations, maintenance, crew training and ground operations, to ensure that the standards required by the Director, and any additional requirements defined by the operator, are being met; and

- (iii) any additional tasks that may be assigned with respect to the financial and non-operational efficiency aspects of the corporate aviation operation.

93.06.4 APPLICATION, ADJUDICATION OF AND ISSUANCE OF CAOC AND OPERATIONS SPECIFICATIONS

1. Document format and layout

All South African certificates (CAOC) and associated operations specifications (OpSpecs) shall be in the form and layout prescribed by Appendix 6, to Annex 6, Part I of the ICAO Annexes.

2. Contents of a certificate

Each CAOC shall contain at least the following information –

- (a) the State of the Operator and the issuing authority;
- (b) the CAOC number and its expiration or valid to date or other means to indicate its validity;
- (c) the operator's name, trading name (if different) and address of the principal place of business;
- (d) the date of issue and the name, signature and title of the authority's representative; and
- (e) the location, in a controlled document carried on board, where the contact details of operational management can be found.

Note – For the purposes of establishing a controlled document to provide the information required by sub-paragraph (e) an operator's operations manual is considered as the means of compliance: Provided the information is contained in a part of the operations manual required to be carried on board the operator's aircraft at all times.

3. Contents of an OpSpec

OpSpecs are issued in different parts and contain the following information as applicable to the Corporate Aviation Operator being granted by the OpSpec –

- (a) telephone number;
- (b) CAOC number;
- (c) business name of the operator including “doing business as” (dba), where applicable;
- (d) date of issue of the OpSpec;
- (e) aircraft makes, types and models to which the specification applies;
- (f) areas and types of operations approved; and
- (g) special limitations, authorisations and approvals.

Note – For more information with respect to the certificate or associated OpSpecs an operator/applicant should contact the Certification Division of the South African Civil Aviation Authority.

93.06.9 OPERATIONAL DEMONSTRATION

- (1) At least one successful demonstration of operations in dispatching a flight shall be accomplished by the operator seeking a Corporate Aviation Operator Certificate (CAOC), prior to conducting corporate aviation operations; and
- (2) The demonstration for an applicant seeking a CAOC shall be accomplished under the conditions as specified by the Director.
- (3) A demonstration may be required in the event a new aircraft type is added to an existing CAOC or if the Director deems it necessary to complete a demonstration.

Notes –

1. Normally, the demonstration will be accomplished using the most complex type of aircraft having the greatest maximum certificated mass to be operated unless the Director determines that, due to the size and complexity of the proposed operations, additional demonstrations are required using other aircraft types.

2. For the purposes of this TS, the complexity of the aircraft is based on its method of propulsion, with the first named aircraft being the least complex –

- (a) reciprocating engine aeroplanes and helicopters;

(b) turbo-propeller aeroplanes; and

(c) turbojet or turbofan aeroplanes.

3. Technical guidance in the conduct of operational demonstrations may be obtained from the SACAA.

93.07.1 ROUTES AND AREAS OF OPERATION AND AERODROME FACILITIES FOR AEROPLANES

1. Destination Alternate Aerodrome Planning Minima

(1) Except as provided in subsection (2), the PIC shall meet the applicable planning minima specified in the following table in order to select an aerodrome as a destination alternate, when required –

<u>Approach and landing</u>	<u>Ceiling</u>	<u>Visibility conditions provisions</u>
<u>Aerodromes supporting instrument approach and landing operations, but not supporting straight-in approach and landing operations to at least two runway ends.</u>	<u>Applicable aerodrome operating minima plus an increment of 400ft</u>	<u>Applicable aerodrome operating minima plus an increment of 1 500m</u>
<u>Aerodromes supporting a straight-in instrument approach and landing operation to different suitable runways.</u>	<u>Applicable aerodrome operating minima plus an increment of 200ft</u>	<u>Applicable aerodrome operating minima plus an increment of 800m</u>

<u>Aerodromes supporting a minimum of two instrument approach and landing operations to different suitable runways, at least one shall be CAT II or III.</u>	<u>For CAT II operations at least 300ft</u> <u>For CAT III operations at least 200ft</u>	<u>For CAT II operations, a prevailing visibility corresponding to at least an RVR of 1 200m</u> <u>For CAT III operations, a prevailing visibility corresponding to at least an RVR of 550m</u>
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Note – The term “different suitable runways” may denote either two or more separate runways or a single runway with a straight-in instrument approach and landing procedure to each end of the runway.

- (2) The criteria specified in subsection (1) need not be complied with: Provided alternative selection criteria are submitted by the operator that are developed as a result of a safety risk assessment, based on the operator’s SMS programme, which provide a level of safety equivalent to that in subsection (1) and are approved by the Director.

2. Extended Range Twin-Engine Operations

2.1 Application

- (1) Applications to the Director for an operations specification (OpSpec) to operate flights in terms of the ETOPS provisions shall be made in a manner acceptable to the Director and that meet the requirements of this TS. Specific certification information is contained in Document TGM CA-AOC-AC-013 ETOPS, available on the SACAA website, which provides an acceptable method of ensuring all certification requirements have been met.
- (2) Only turbine-powered aeroplanes shall be considered for approval to conduct ETOPS flights.

2.2 Aerodrome criteria

- (1) Adequate aerodrome

An adequate aerodrome is an aerodrome which the operator considers to be satisfactory, taking into account landing performance requirements at the expected landing weight and runway characteristics. In addition, it should be anticipated that,

at the expected time of use, the aerodrome will be available and equipped with necessary ancillary services, such as ATS, sufficient lighting, communications, weather reporting, nav aids and emergency services.

(2) ETOPS en route alternate airport

- (a) An ETOPS en route alternate airport means an adequate airport that is listed in the corporate aviation operator's company operations manual and meets the planning minima specified in section 3.3.
- (b) For all operations under this Part, the PIC shall comply with the planning minima specified in section 3.3.

2.3 Planning minima for an ETOPS en route alternate

To be suitable to be listed in the flight plan as an ETOPS en route alternate aerodrome, the following additional criteria must be met –

- (a) the availability of an ATC facility;
- (b) the availability of at least one letdown aid for an instrument approach; and
- (c) the appropriate weather reports or forecasts, or any combination thereof, indicate that, during a period commencing one hour before and ending 1 hour after the expected time of arrival at the aerodrome, crosswind landing limits will not be exceeded and the weather conditions will be at or above the planning minima prescribed in the table below, and in accordance with the operator's ETOPS approval.

Planning minima – ETOPS

<u>Type of approach</u>	<u>Planning minima</u>		
	<u>at least 2 separate approach procedures based on 2 separate aids serving 2 separate runways</u>	<u>at least 2 separate approach procedures based on 2 separate aids serving 1 runway</u>	<u>at least 1 approach procedure based on 1 aid serving 1 runway</u>

<u>Precision approach Cat II, III (ILS MLS)</u>	<u>Precision approach Cat I minima</u>	<u>Non-precision approach minima</u>
<u>Precision approach Cat I (ILS MLS)</u>	<u>Non-precision approach minima</u>	<u>Circling minima or, if not available, non-precision approach minima plus 200ft/1 000m</u>
<u>Non-precision approach</u>	<u>The lower of non-precision approach minima plus 200ft/1 000m or circling</u>	<u>The higher of circling minima or non-precision approach minima plus 200ft/1 000m</u>

Notes –

- (1) “Tempo” and “Inter” conditions published in the forecast are not limiting unless these conditions are forecast to be below published planning minima. Where a condition is forecast as “Prob”, provided the probability per cent factor is less than 40%, it is not limiting. However the PIC will be expected to exercise good aviation judgment in assessing the overall “Prob” conditions.
- (2) Runways on the same aerodrome are considered to be separate runways when –
 - (a) they are separate landing surfaces which may overlay or cross such that if one of the runways is blocked, it will not prevent the planned type of operations on the other runway; and
 - (b) each of the landing surfaces has a separate approach procedure based on a separate aid.
- (3) Only operators approved for Category II or III operations may use the planning minima applicable to Categories II and III in the table and then only if the aeroplane is certificated for a one engine inoperative Category II or III approach, as applicable.
- (4) The JAA Information Leaflet No. 20, IL20, may also be used by an operator to conduct an ETOPS operation, together with the ETOPS en route alternate weather

criteria determined in this technical standard.

**93.07.2 ROUTES AND AREAS OF OPERATION AND AERODROME FACILITIES FOR
HELICOPTERS**

1. Destination Alternate Aerodrome Planning Minima

- (1) Except as provided in subsection (2), the PIC shall meet the applicable planning minima specified in the following table in order to select an aerodrome as a destination alternate, when required –

<u>Approach and landing</u>	<u>Ceiling</u>	<u>Visibility conditions</u>
<u>Aerodromes supporting instrument approach and landing operations, but not supporting straight-in approach and landing operations to at least two runway ends.</u>	<u>Applicable aerodrome operating minima plus an increment of 400ft</u>	<u>Applicable aerodrome operating minima plus an increment of 1 500m</u>
<u>Aerodromes supporting a straight-in instrument approach and landing operation to different suitable runways.</u>	<u>Applicable aerodrome operating minima plus an increment of 200ft</u>	<u>Applicable aerodrome operating minima plus an increment of 800m</u>

<u>Aerodromes supporting a minimum of two instrument approach and landing operations to different suitable runways, at least one shall be CAT II or III.</u>	<u>For CAT II operations at east 300ft</u> <u>For CAT III operations at least 200ft</u>	<u>For CAT II operations, a prevailing visibility corresponding to at least an RVR of 1 200m</u> <u>For CAT III operations, a prevailing visibility corresponding to at least an RVR of 550m</u>
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Note – The term “different suitable runways” may denote either two or more separate runways or a single runway with a straight-in instrument approach and landing procedure to each end of the runway.

- (2) The criteria specified in subsection (1) need not be complied with: Provided alternative selection criteria are submitted by the operator that are developed as a result of a safety risk assessment, based on the operator’s SMS programme, which provide a level of safety equivalent to that in subsection (1) and are approved by the Director.

2. Use of Offshore Alternates

The following are the requirements associated with using offshore alternates:

- (a) the offshore alternates shall be used only after a point of no return (PNR). Prior to a PNR, onshore alternates shall be used;
- (b) mechanical reliability of critical control systems and critical components shall be considered and taken into account when determining the suitability of the alternates;
- (c) one-engine inoperative performance capability shall be attainable prior to arrival at the alternate;
- (d) to the extent possible, deck availability shall be guaranteed; and
- (e) weather information must be reliable and accurate.

Planning minima – ETOPS

<u>Type of approach</u>	<u>Planning minima</u>		
	<u>at least 2 separate approach procedures based on 2 separate aids serving 2 separate runways</u>	<u>at least 2 separate approach procedures based on 2 separate aids serving 1 runway</u>	<u>at least 1 approach procedure based on 1 aid serving 1 runway</u>
<u>Precision approach Cat II, III (ILS MLS)</u>	<u>Precision approach Cat I minima</u>	<u>Non-precision approach minima</u>	
<u>Precision approach Cat I (ILS MLS)</u>	<u>Non-precision approach minima</u>	<u>Circling minima or, if not available, non-precision approach minima plus 200ft/1 000m</u>	
<u>Non-precision approach</u>	<u>The lower of non-precision approach minima plus 200ft/1 000m or circling</u>	<u>The higher of circling minima or non-precision approach minima plus 200ft/1 000m</u>	

Notes –

- (1) “Tempo” and “Inter” conditions published in the forecast are not limiting unless these conditions are forecast to be below published planning minima. Where a condition is forecast as “Prob”, provided the probability per cent factor is less than 40%, it is not limiting. However the PIC will be expected to exercise good aviation judgment in assessing the overall “Prob” conditions.
- (2) Runways on the same aerodrome are considered to be separate runways when –
 - (c) they are separate landing surfaces which may overlay or cross such that if one of the runways is blocked, it will not prevent the planned type of operations on the

other runway; and

- (d) each of the landing surfaces has a separate approach procedure based on a separate aid.
- (3) Only operators approved for Category II or III operations may use the planning minima applicable to Categories II and III in the table and then only if the aeroplane is certificated for a one engine inoperative Category II or III approach, as applicable.
- (4) The JAA Information Leaflet No. 20, IL20, may also be used by an operator to conduct an ETOPS operation, together with the ETOPS en route alternate weather criteria determined in this technical standard.

93.07.7 IFR OR NIGHT FLIGHT WITHOUT A SECOND-IN-COMMAND

1. General

This technical standard states the provision for the operation of an aircraft with passengers on board in IMC or at night without a second-in-command.

Note – The term “single-pilot IFR” will be used to denote a pilot authorised to fly in IMC or at night without a second-in-command.

2. Aircraft/equipment requirements

In addition to the equipment required by Subpart 5 of CAR Part 93, an aircraft involved in a single-pilot operation in IMC or at night shall be equipped with –

- (a) an autopilot that is capable of operating the aircraft controls to maintain flight and manoeuvre the aircraft about the lateral and longitudinal axes;
- (b) a headset with a boom microphone or equivalent and a transmit button on the control column (cyclic or collective stick); and
- (c) a chart holder that is placed in an easily readable position and a means of illumination for the chart holder.

3. Pilot qualification, training and proficiency requirements

Aeroplane:

(1) The pilot shall have the following experience –

- (a) for operations under IFR or at night, have accumulated at least 50 hours flight time on the class of aeroplane, of which at least 10 hours shall be as PIC;

- (b) for operations under IFR, have accumulated at least 25 hours flight time under IFR on the class of aeroplane, which may form part of the 50 hours flight time in sub-paragraph (a); and
- (c) for operations at night, have accumulated at least 15 hours flight time at night, which may form part of the 50 hours flight time in paragraph (a).

Notes:

- (1) Only a FSTD that is representative of the helicopter to be flown, including navigation systems and flight deck layout, shall be approved for use.
 - (2) Training shall include use of the autopilot with and without the introduction of abnormal and emergency conditions.
 - (3) Any engine-out training done in the helicopter must be simulated.
 - (4) Single engine helicopters are not subject to the engine-out training requirements.
- (2) A pilot shall complete the training requirements specified in section 3.10 and 3.11 of technical standard 93.03.3 and a single-pilot pilot proficiency check (PPC) prior to being assigned to single-pilot duties.
 - (3) The PPC shall be in the aircraft type or variant flown unless the operator has been approved for aircraft grouping for training and PPC purposes, in which case the sequencing of the PPCs shall be as provided in such approval and shall be conducted so as to include at least the following –
 - (a) knowledge of the regulatory and company operating procedures relating to single-pilot IMC or night flight;
 - (b) knowledge of the autopilot operations and limitations;
 - (c) performance of normal and emergency procedures as a single pilot without assistance;
 - (d) passenger briefings as required by this Subpart including emergency briefings and cabin preparation for emergency evacuation; and
 - (e) demonstration of the use of the autopilot during appropriate phases of flight.
 - (4) Where a pilot successfully completes a single-pilot IFR proficiency check, as specified in subsection (3) the pilot's licence or other document provided for that purpose shall be endorsed for single-pilot IFR.

Helicopters:

- (1) An operator may not conduct single-pilot IMC or night flight operations unless the PIC, within the preceding 90 days, has completed the following single-pilot training in the helicopter, a FSTD or a combination of helicopter and FSTD:
 - (a) if flight in IMC is to be undertaken:
 - (i) at least two instrument departures, under simulated or actual IMC which shall include at least one simulated engine failure after take-off in a simulator or under simulated IMC;
 - (ii) a minimum of five approaches consisting of at least two precision or non-precision approaches;
 - (iii) in a multi-engine helicopter:
 - (aa) at least one missed approach during which an engine failure is introduced;
 - (bb) at least one engine-out approach; and
 - (cc) at least three landings from approaches, one of which shall be with an engine out; and
 - (b) if night flight is to be undertaken, five take-offs and landings at night.

4. Special conditions and procedures

- (1) All flights operated in IFR flight shall be restricted to the following altitudes/ flight levels –
 - (a) in case of pressurised aeroplanes all flights shall be conducted at or below FL 250 unless the aeroplane manufacturer has established the conditions under which flight above such altitude may be undertaken without a second-in-command with respect to access to an emergency source of oxygen in the event an emergency descent is required and the pilot has trained for such an event at or near the highest altitude authorised for that aeroplane; and
 - (b) in the case of unpressurised aeroplanes and all helicopters, all flights shall be conducted at or below the altitude at which the pilot is not required by these regulations to be using continuous oxygen.
- (2) A pilot's single-pilot IFR proficiency may be transferred to another operator: Provided

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- (a) the proficiency validity has not yet expired;
- (b) the aircraft to be operated are of the same type and variant on which the current PPC was conducted;
- (c) the pilot has received training to ensure the pilot is familiar and competent in all procedures used by the other operator; and
- (d) the other operator is authorised in its operations specification to transport persons in aircraft in IMC without a second-in-command.

93.07.9 REFUELLING AND DEFUELLING WITH PASSENGERS ON BOARD

Aircraft may be fuelled with passengers embarking, disembarking or on board under the following conditions –

- (a) in order to ensure that crew members receive prompt notification of a situation threatening safety such as major fuel spill or a fire, a means is established for the ground crew supervising the fuelling to alert the qualified personnel on board the aircraft that the passengers must disembark or be evacuated as necessary;
- (b) the aircraft engines are not running unless the aircraft incorporates a propeller brake and the brake is set;
- (c) during the fuelling process –
 - (i) aircraft ground power generators or other electrical ground power supplies are not being connected or disconnected;
 - (ii) combustion heaters installed on the aircraft (e.g. wing and tail surface heaters, integral cabin heaters) are not operated;
 - (iii) known high energy equipment such as High Frequency (HF) radios are not operated, unless in accordance with the aircraft manufacturer's approved flight manual where the manual contains procedures for the use of this equipment during fuelling;
 - (iv) weather-mapping radar equipment in the aircraft is not operated unless in accordance with the manufacturer's approved aircraft flight manual where the manual contains procedures for use during fuelling;
 - (v) aircraft batteries are not being removed or installed;

- (vi) external battery chargers are not being connected, operated or disconnected;
- (vii) aeroplane-borne or helicopter-borne APUs which have an efflux discharging into the zone are not started after filler caps are removed or fuelling connections are made;
- (viii) if an auxiliary power unit is stopped for any reason during fuelling it shall not be restarted until the flow of fuel has ceased and there is no risk of igniting fuel vapours; however, the APU may be operated in accordance with the manufacturer's approved aircraft flight manual if the manual contains procedures for starting the APU during fuelling;
- (ix) electric tools or similar tools likely to produce sparks or arcs are not being used; and
- (x) photographic equipment is not used within 3m of the fuelling equipment or the fill or vent points of the aircraft fuel systems;

- (d) fuelling is immediately suspended when there are lightning discharges within 8km of the aerodrome;
- (e) the aircraft is fuelled in accordance with manufacturer's procedures for that type of aircraft;
- (f) the aircraft emergency lighting system is armed or on, if applicable;
- (g) "No Smoking" signs on board the aircraft are illuminated, if installed;
- (h) procedures are established to ensure that passengers do not smoke, operate portable electronic devices or otherwise produce sources of ignition;
- (i) at least the entry door through which the passengers embarked is designated as the evacuation exit during fuelling and is open;
- (j) the designated evacuation exits during fuelling are identified by aircraft type and published in the corporate aviation operator's operations manual.
- (k) The designated exits must be clear and available for immediate use by passengers and crew members should an evacuation be required. The designated evacuation exits shall be clearly specified during the passenger briefing.
- (l) the operator or PIC has procedures in place to ensure that there is a ready escape route from each designated evacuation exit during fuelling;
- (m) a member of the flight crew or a person designated by the operator who has received training in fuelling operations with passengers on board shall be in attendance and

identified to the passengers as the person responsible for cabin safety during the fuelling procedures; and

- (n) the emergency exit available for use in the event of an evacuation shall be opposite to where the refuelling or defuelling is taking place.

93.07.13 OPERATIONAL CONTROL AND SUPERVISION OF FLIGHT OPERATIONS

1. Operational control and supervision

- (1) A Corporate Aviation Operator shall exercise operational control over its flights through its operational control system.
- (2) The person responsible for flight operations shall have the ultimate decision-making authority in all matters affecting flight operations in general, and the OCS in particular, after consideration of any other factors that could impact on the execution of a flight such as financial, corporate requirements or other non-operational considerations.
- (3) The operator is responsible for putting in place communication equipment and facilities as appropriate to the operator's flight following system and ensuring such equipment is serviceable during the period of time any company flight is in progress.
- (4) The pilot-in-command is responsible for the release of each flight and has the final authority as to the continuation, diversion or termination of a flight.

2. Definitions

“flight follower” means the person assigned the responsibility for flight following and such other duties as may be assigned;

“flight following” means the monitoring of a flight's progress, the provision of such operational information as may be requested by the PIC and the notification to appropriate operator and search-and-rescue authorities if the flight is overdue or missing. Meteorological information provided to the PIC by a flight follower shall not include analysis or interpretation by the flight follower unless such flight follower is a certified flight operations officer;

“flight release” means the agreement by the PIC, as witnessed by his or her signature, that the flight has been planned and is being released for flight in accordance with the provisions of the operations manual;

“flight monitoring” means monitoring all factors and conditions that might affect the operational flight plan (OFP) and which may be the responsibility of the PIC or other person assigned by the person responsible for flight operations;

“pilot self-dispatch” means a flight where the PIC has been given authority from the operations manager to exercise operational control over such flights.

3. Approval of an operational control system

- (1) Each Corporate Aviation Operator shall publish in its operations manual the details of its proposed OCS including pre- and post-flight procedures, flight following or flight monitoring, as applicable, and procedures to be followed in the event of missing or overdue flights and during emergency or abnormal situations. Upon approval of the operations manual, the OCS shall be deemed to have been approved by the Director.
- (2) A Corporate Aviation Operator choosing, in order to meet its own operational needs, to dispatch its flights under an OCS that utilises a flight operations officer (FOO) for flight release and flight monitoring shall meet the requirements of a Type A operational control system as specified in technical standard 121.07.13 of Document SA-CATS 121.
- (3) The Director may require an operator to upgrade its OCS in order to satisfy the conditions for issue of certain operations specifications (OpSpecs).

4. Description of the required operational control system

The minimum requirements of an OCS under this Part are as follows –

(a) Responsibility and authority

Operational control is delegated to the PIC of a flight by the operations manager who retains responsibility for the day-to-day conduct of flight operations.

(b) Centres

Current information on the location of the operator’s aircraft shall be maintained at the main base of operations or, where appropriate, at a sub-base of operations. The corporate’s head office may serve as the main base or sub-base of operations.

(c) Communications

The operator shall ensure that the flight crew has a means to communicate with the operator while on the ground.

(d) Personnel on duty

- (i) An operator shall ensure personnel qualified in accordance with CAR 93.02.7 are available during flight time as applicable to the OCS

approved for use by the company.

(ii) The operator shall clearly identify in its operations manual the duties and responsibilities of the persons responsible for flight following.

(iii) The operator shall ensure that each flight follower is trained in accordance with the requirements of its approved training programme.

(e) Flight release

(i) Flights operated under the operator's OCS are pilot self-dispatched and released in accordance with the operator's established procedures. Such procedures shall be published in the operator's operations manual.

(ii) The person responsible for the development of the operational flight plan (OFP), shall receive training in every aspect of its preparation. The OFP shall meet the requirements of technical standard 93.04.4 and may be in any format at the operator's discretion but such format shall be standard and used by all flight crew.

(iii) The signature or alternative means of signifying acceptance of the OFP by the PIC shall constitute a flight release and shall certify that –

(aa) the OFP has been prepared and accepted in accordance with the procedures specified in the operations manual; and

(bb) the flight is safe to proceed.

(f) Flight monitoring and flight following

(i) A Corporate Aviation Operator shall ensure that procedures are established as part of the OCS to enable it to determine if a flight is overdue or has had to divert.

(ii) Where communications facilities permit, the PIC is expected to report departures and arrivals to the person assigned to the flight following of that flight. At the very least the PIC shall notify the operator upon arrival at the final destination of a particular flight or series of flights.

(iii) The PIC, though solely responsible for flight monitoring, shall be supported by a flight following system containing the following elements –

(aa) a flight follower, qualified in accordance with Subpart 3 of CAR Part 93 and knowledgeable in the operator's flight alerting procedures, on duty and able to respond to requests by the PIC for information related to the flight. Such information may include

meteorological information without analysis or interpretation; and

- (bb) the ability by the operator to have a means to follow the progress of each flight from its commencement to its termination, including any intermediate stops or diversions from the flight planned route.

Note – Use of air traffic services in determining the location of a flight is adequate.

5. Declaration and action in an emergency

- (1) In an emergency situation that requires immediate decision and action, the PIC shall take any action he or she deems necessary for the safety of the aircraft and passengers.
- (2) Where the assigned flight follower or operations manager becomes aware of any emergency situation that could pose a hazard to a flight in progress, he or she shall make every effort to advise the PIC of such emergency by the quickest means available. Furthermore, he or she shall –
- (a) remain available to the PIC of that flight on a continuous basis until –
- (i) the threat of such emergency has passed;
- (ii) the PIC has made a decision and acted upon it and it has been determined that the operator's assistance is no longer required; or
- (iii) the flight is handed off to another competent person who is able to be of assistance;
- (b) relay required messages through third parties as necessary to communicate with the flight; and
- (c) notify the nearest air traffic services unit and appropriate authority of the emergency and request such assistance as may be necessary.
- (3) In the event an aircraft becomes overdue or missing, the overdue or missing aircraft procedures, as appropriate, shall be followed as prescribed in the operations manual. Such procedures shall include, as a minimum, reporting the overdue or missing aircraft to an air traffic services unit, the appropriate authority and search and rescue authorities.
- (4) Whenever a PIC, flight follower or operations manager declares an emergency, he or she shall keep the appropriate ATC facility and dispatch centres fully informed as to the progress of the flight.

93.07.21 INERTIAL NAVIGATION AND INERTIAL REFERENCE SYSTEMS

1. General

Inertial navigation may be authorised in a Corporate Aviation Operations specifications (OpSpecs) or for aircraft operated in terms of CAR 93.01.1 (a) or (b). For the holders of an OpSpec, inertial navigation may be used to satisfy the requirements for navigation in airspace where minimum navigation performance specifications apply. The inertial navigation system (INS) or inertial reference system (IRS) and its installation must be certified by the Director as meeting the airworthiness standards prescribed in Part 21.

Notes –

1. Airworthiness requirements will be satisfied provided that –
 - (a) the equipment has been installed to the manufacturer's requirements;
 - (b) the installation is listed in the aircraft type certificate or has a supplemental type certificate for the specific aircraft type;
 - (c) there is a flight manual supplement covering any system limitations; and
 - (d) the system is included in the operator's maintenance programme.
2. Outside SA (for example, in Europe and over the North Atlantic) other State authorities might require navigation performance different to that required by these standards.

2. Minimum performance for operational approval

- (1) An INS/IRS shall meet the following criteria for operational approval and shall be maintained to ensure performance in accordance with the criteria –
 - (a) with a 95% probability the radial error rate is not to exceed 2nm per hour for flights up to 10 hours duration (Helicopter: 1nm per hour for flights up to 5 hours duration); and
 - (b) with a 95% probability the cross-track error is not to exceed ±20nm and along track error is not to exceed ±25nm at the conclusion of a flight in excess of 10 hours (Helicopter: ±10nm and along track error is not to exceed ±12.5nm at the conclusion of a flight in excess of 5 hours).
- (2) The INS/IRS should have the capability for coupling to the aircraft's autopilot to provide steering guidance.

- (3) The navigation system should have the capability for updating the displayed present position.

3. Serviceability requirements

- (1) An INS/IRS may be considered as serviceable for navigation purposes until such time as its radial error exceeds $3 + 3t$ nm (t being the hours of operation in the navigation mode).
- (2) Maintenance corrective action must also be taken when an INS/IRS is consistently providing radial error rates in excess of 2nm per hour and/or track and along track errors in excess of the tolerance given at sub-section (1) on more than 5% of the sectors flown.

4. System performance monitoring

The operator is to monitor and record the performance of INS/IRS and may be required to provide details of the system accuracies and reliabilities from time to time.

5. Navigation criteria

Navigation using INS/IRS as the primary navigation means is permitted in accordance with the following conditions –

- (a) initial confidence check. The INS/IRS must be checked for reasonable navigation accuracy by comparison with ground-referenced radio navigation aids (which may include ATC radar) before proceeding outside the coverage of the short range radio navigation aids system;
- (b) maximum time –
- (i) single INS/IRS –
- (aa) the maximum operating time since the last ground alignment is not to exceed 10 hours (helicopter: 5 hours);
- (bb) Aeroplane only: on flights of more than 5 hours, any route sector may be planned for navigation by INS/IRS within the appropriate time limits (given in (cc) below) but contingency navigation procedures must be available in the event of an INS/IRS inflight unserviceability which would preclude the aircraft's operation on a subsequent route sector for which area navigation is specified; and
- (cc) INS/IRS may be used as a sole source of tracking information for

continuous period not exceeding –

(A) Three hours in controlled airspace other than oceanic control area (OCA); or

(B) Five hours in OCA or outside controlled airspace (OCTA);

(ii) two or more INS/IRS –

(aa) if, during a flight, 10 hours (helicopter: 5 hours) elapsed time since the last ground alignment will be exceeded, ground alignment is to be included in the pre-flight flight deck procedures prior to departure; and

(bb) INS/IRS may be used as the sole source of tracking information for continuous periods not exceeding –

(A) Five hours in controlled airspace other than OCA; or

(B) Aeroplane only: 12 hours in OCA or OCTA;

Notes –

1. Provided that the use of INS/IRS as the sole means of navigation does not exceed the time limit, the aircraft may be operated for longer periods using the INS/IRS with either manual or automatic updating.

2. The 5 hour limit on single INS/IRS ensures 99.74% (3 sigma) probability that loss of satisfactory navigation capability will not occur with equipment mean time between failures (MTBF) of approximately 1900 hours. If the demonstrated MTBF exceeds 2000 hours, the maximum time may be increased.

(c) updating inertial present position in flight is permitted in the following instances only –

(i) manually –

(aa) overhead a VOR beacon;

(bb) within 25nm of a co-located VOR/DME beacon; or

(cc) over a visual fix when at a height not more than 5 000ft above the feature;

(ii) automatically (aeroplane only) –

- (aa) within 200 nautical miles of a DME site when the aircraft's track will pass within 140nm of the site;
- (bb) within 200nm of both DME sites for a DME/DME Fix;
- (cc) from a co-located VOR/DME beacon provided that updates from a receding beacon are not accepted when the beacon is more than 25nm from the aircraft;

Notes –

1. En route VOR and DME sites separated by not more than 500 metres are considered to be co-located.
 2. DME slant range error correction might be necessary in some circumstances.
 3. Updating a present position from a visual fix may not be planned for IFR flights.
 4. A receding beacon is one from which the distance to the aircraft is increasing.
 5. Updating in other circumstances (for example, over a NDB) will not provide sufficient accuracy to ensure that the INS/IRS operates within the prescribed tolerances for navigation.
 6. Because INS/IRS are essentially accurate and reliable, and ground alignment is more accurate than in-flight updating, updating of present position is usually not warranted especially during the initial few hours of operation. However, INS/IRS errors generally increase with time and are not self-correcting. Unless the error is fairly significant (for example, more than 4nm/hr along track or 2nm/hr cross track) it may be preferable to retain the error rather than manually update.
- (d) Limitation on use. Wherever track guidance is provided by radio navigation aids, the PIC must ensure that the aircraft remains within the appropriate track-keeping tolerances of the radio navigation aids. INS/IRS is not to be used as a primary navigation reference during IFR flight below lowest safe altitude (LSALT); and
 - (e) Pre-flight and en route procedures. The following practices are required –
 - (i) new data entries are to be cross-checked between at least two flight crew members for accuracy and reasonableness, or, for single-pilot operations, an independent check (for example, of INS/ IRS-computed tracks and distances against the flight plan) must be made;
 - (ii) as a minimum, position and tracking information is to be checked for

reasonableness (confidence check) in the following cases –

- (aa) prior to each compulsory reporting point;
- (bb) at or prior to arrival at each en route way point during RNAV operation along RNAV routes;
- (cc) at hourly intervals during area type operation of established RNAV routes; and
- (dd) after insertion of new data.

6. Operating criteria

- (1) For two or more INS/IRS installations –
 - (a) if one INS/IRS fails or can be determined to have exceeded a radial error of 3+3t nm, operations may continue on area navigation routes using the serviceable system(s) in accordance with the navigation criteria applicable to the number of INS/IRS units remaining serviceable;
 - (b) if –
 - (i) the difference of pure inertial readouts between each pair of INS/IRS is less than 1.4 (3+3t) nm, no action is required;
 - (ii) the difference of pure inertial readouts between any pair of INS/IRS exceeds 1.4 (3+3t) nm and it is possible to confirm that one INS/IRS has an excessive drift error, that system should be disregarded and/or isolated from the other systems) and the apparently serviceable system(s) should be used for navigation; and

Note – This check and its isolation action are unnecessary if a multiple INS/IRS installation is protected by a serviceability self-test algorithm.
 - (iii) if neither condition prescribed in subparagraph (i) or (ii) can be satisfied, another means of navigation should be used, and the PIC must advise the appropriate ATS unit.
- (2) For single INS/IRS installations, if the INS/IRS fails or exceeds the serviceability tolerance –
 - (a) the PIC must advise the appropriate ATS unit of INS/IRS failure;
 - (b) another means of navigation is to be used; and

(c) the aircraft is not to begin a route sector for which area navigation is specified unless it is equipped with an alternative, serviceable, approved area navigation system.

(3) Autopilot coupling to the INS/IRS should be used, whenever practicable, if this feature is available. If for any reason the aircraft is flown without autopilot coupling, the aircraft is to be flown within an indicated cross-track tolerance of ± 2 nm. In controlled airspace the ATS unit is to be advised if this tolerance is exceeded.

7. Navigation tolerances

(1) The maximum drift rate expected from INS/IRS is 2nm per hour (2 sigma probability). For the purposes of navigation and determining aircraft separation, the 3 sigma figure of 3nm is allowed so that the maximum radial error with 3 sigma confidence equals $3+3t$ nm, where t equals the time in hours since the INS/IRS was switched into the navigation mode.

(2) DME and other inputs can automatically influence the INS/IRS to improve the accuracy of its computed position. The pilot may also insert known position coordinates to update the INS/IRS. Therefore, if the system is updated with known position information the position error is reduced and the INS/IRS can be assumed to operate within the radial error tolerance of $3+3T$ nm where T is the time (hours elapsed since the last position update).

(3) The accuracy of the data used for updating must be considered. The navigation aid positions used for updating inertial present position are accurate to within 0.1nm. However, the aircraft in flight cannot be “fixed” to the same order of magnitude. The accuracy of the position fix is taken as ± 3 nm radial error.

(4) Because the INS/IRS error, the navigation aid position accuracy and the position fix errors are independent of each other, the total radial error is determined by the root-sum-square method –

$$\underline{\text{Total error}} = \sqrt{(3 + 3T)^2 + 0.1^2 + 3^2 \text{ nm}}$$

(5) The effect of navigation aid position accuracy on the total error is negligible, and so,

$$\underline{\text{Total error}} = \sqrt{(3 + 3T)^2 + 3^2 \text{ nm}}$$

$$\equiv \sqrt{(1 + T)^2 + 1 \text{ nm}}$$

Substituting values for T at time of update, total

radial error = 4,2nm after 1 hour
= 6,7nm after 2 hours
= 9,5nm after 3 hours
= 12,4nm after 4 hours
= 15,3nm after 5 hours
= 18,2nm after 6 hours

21,2nm

- (6) If two INS/IRS are installed and the aircraft is navigated by averaging, the inertial present position formula for the total radial error given in sub-paragraph (4) is modified by multiplying by

$$\frac{1}{\sqrt{2}} = (= 0,7)$$

- (7) If three INS/IRS are installed and “triple mix” is used, the total radial error is further reduced. For simplicity for navigation and aircraft separation, the tolerances applicable to dual installations apply and the third system provides redundancy.

93.07.22 LOW VISIBILITY OPERATIONS

1. Low visibility operations – certification overview

- (1) Low visibility operations (LVO) are comprised of lower-than-normal visibility minima take-off (LVTO) and lower-than-normal weather and visibility minima approach operations (CAT II/III approaches). An applicant for a operations specification (OpSpec) authorising low visibility operations shall meet the certification criteria contained in this TS.

Note – To assist an operator in the certification process and establishing operational procedures for CAT II/III operations, SACAA has placed TGM CA AOC-AC-FO-011 Category II and III Operations on its website.

- (2) A Corporate Aviation Operator shall only conduct LVO if –
- (a) the operator has the appropriate OpSpecs and its aircraft are certificated for LVO and are equipped in accordance with this Part or an equivalent regulation accepted by the Director;
 - (b) the operator has an approved training programme and the flight crews and supporting crews, as applicable, are trained and tested in LVO;
 - (c) the operator has established procedures to ensure LVO are conducted to the highest possible level of safety;
 - (d) a suitable system for recording approach or automatic-landing success and failure is established and maintained to monitor the overall safety of the operation;
 - (e) the ground-based equipment meets the LVO criteria for safe operation; and
 - (f) the low visibility operational zone is maintained in a sterile condition during LVO.

Note – Failure to meet any of the above criteria or the certification standards described herein is cause for LVO OpSpecs to be suspended.

- (3) The available approvals for LVTO operations are dependent upon the aircraft category and aerodrome equipment and may be –
- (a) RVR not lower than 75m if using an approved lateral guidance system; and
 - (b) RVR not less than 150m for Category A, B and C aeroplanes or RVR not less than 200m for Category D and E aeroplanes if not using an approved lateral guidance system.
- (4) The categories referred to in subsection (3) above are established on the basis of 1.3 times the stall speed of the aeroplanes in the landing configuration at maximum certificated landing mass and are as follows –
- (a) Category A – less than 91 knots indicated airspeed;
 - (b) Category B – 91 knots indicated airspeed or more, but less than 135 knots indicated airspeed;
 - (c) Category C – 135 knots indicated airspeed or more, but less than 141 knots indicated airspeed;
 - (d) Category D – 141 knots indicated airspeed or more, but less than 166 knots indicated airspeed; and
 - (e) Category E – 166 knots indicated airspeed or more, but less than 211 knots indicated airspeed.

Note – In the event of low-visibility procedures being in force, the Air Traffic and Navigation Services Company will report to the Director details of all aeroplanes attempting an approach, the RVR visibility at the time, and the outcome of the approach attempt. This information will be used by the SACAA in investigation of approaches attempted outside of the operator's equipment and PIC limitations or approval.

- (5) CAT II/III limits may be found technical standard 91.07.5 of Document SA-CATS 91.

2. Low visibility operations – equipment requirements

- (1) The corporate operator of an aircraft shall include the minimum equipment which shall be serviceable at the commencement of a LVTO or a CAT II or III approach in its operations manual. Details of required equipment for CAT II/III may be found in TGM

CA AOC-AC-FO-011 Category II and III Operations, Chapter 2 – Aircraft Requirements.

- (2) The PIC shall satisfy him or herself that the status of the aircraft and the relevant airborne systems thereof is appropriate for the specific operation to be conducted.

3. Low visibility operations – facilities requirements

- (1) The specific facilities required to ensure safe LVO involve both the aerodrome and the PIC.
- (2) No PIC of an aeroplane shall use an aerodrome for LVO, unless the aerodrome is approved for such operations by the appropriate authority of the State in which the aerodrome is located.
- (3) The operator or PIC of an aeroplane intended to be used in LVO shall verify that low-visibility procedures have been established and are in force at the aerodromes where such operations are to be conducted.
- (4) Criteria for the approval of an aerodrome to allow LVO to be conducted are –
- (a) for low visibility take-offs with RVR of $\geq 150\text{m}$ ($\geq 200\text{m}$ for Category D and E aeroplanes) to $< 400\text{m}$ –
- (i) multiple RVR sources;
 - (ii) runway high intensity edge lights spaced 60m or less;
 - (iii) runway centreline lights spaced 15m or less and marking;
 - (iv) runway electrical multi-looping (multi-circuit design); and
 - (v) a secondary power supply;
- (b) for low visibility take-offs with RVR $\geq 75\text{m}$ to $< 150\text{m}$ ($< 200\text{m}$ for Category D and E aeroplanes), in addition to those noted in sub-paragraph (a), a functioning lateral guidance system for take-off; and

Note – For an aerodrome to be approved for LVTO operations, additional criteria are applied based on guidance in ICAO Document 9476, Manual of Surface Movement Guidance and Control Systems, and Document 9365, All Weather Operations Manual. It is up to the operator and/or PIC to ensure an aerodrome is suitably qualified for LVO before using it.

(c) for CAT II/III operations, refer to TGM CA AOC-AC-FO-011 Category II and III Operations, Chapter 4 – The Airport.

(5) The requirements for the operator to conduct LVO are –

(a) the establishment of procedures and instructions to be used for LVTO and Category II and III operations that will ensure –

(i) the PIC establishes that the status of the visual and non-visual facilities is sufficient prior to commencing a LVTO or a Category II and III approach; and

(ii) the PIC confirms with the air traffic service unit, before commencing a LVTO or a Category II and III approach, that appropriate low-visibility procedures are in force and the aircraft has been issued the appropriate clearances;

(iii) a 90m visual segment is available from the cockpit at the start of the take-off run; and

(iv) the required RVR value has been achieved for all of the relevant RVR reporting points;

(b) the flight deck crew members are properly qualified to carry out a low-visibility take-off or a Category II and III approach; and

(c) the PIC ensures there are no MEL items or other aeroplane un-serviceabilities that would disqualify the flight from attempting a LVO.

4. Low visibility operations – personnel requirements

(1) Criteria for pilot qualifications and crew certification to allow CAT II/III operations to be conducted are covered in TGM CA AOC-AC-FO-011 Category II and III Operations, Chapter 3 – Operation of the Aircraft.

(2) Each operator applying for authorisation to conduct LVO shall establish and maintain an initial and recurrent ground and flight training programme as specified in of TS 93.03.3 that will ensure its flight crew are proficient in operating in such environment and shall publish its LVO training programme in its operations manual.

(3) The PIC shall ensure that LVO training is completed in accordance with TS 93.03.3. LVO training shall be endorsed in the flight crew's pilot licence or other accepted training document.

(4) The flight deck crew qualification requirements are specific to the operator and the

type of aeroplane operated and the operator or responsible person shall ensure that each flight deck crew member completes a flight check (skills test) before conducting LVTO or Category II or III operations and that subsequent proficiency checks include LVO take-offs and approaches.

93.07.23 OPERATIONS WITH HEAD-UP DISPLAYS, ENHANCED VISION SYSTEMS OR NIGHT VISION GOGGLES

1. Introduction

- (1) This TS provides guidance for the approval for use of head-up displays (HUD), enhanced vision systems (EVS) and night vision goggles (NVG) intended for installation and operational use in aircraft engaged in corporate aviation. HUD and EVS may be installed and operated to enhance situational awareness or to obtain an operational credit such as lower minima for take-off, approach or landing operations. HUD and EVS may be installed separately or together as part of a hybrid system. Use of these systems during instrument flight and any operational credit gained from their use requires approval from the Director.
- (2) No pilot may use a HUD, EVS or NVG in flight in IMC unless such pilot has received the training and checking specified in this TS.
- (3) No PIC shall use a HUD, EVS or NVG 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) 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 –
- (a) an understanding of the 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 the 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); and
 - (e) any effects that weather, such as low ceilings and visibilities, may have on the performance of a HUD.
- (3) Flight training of at least two hours shall be accomplished using an aircraft or flight simulation training device (FSTD) equipped with the same type of HUD to be used in the aircraft. The training shall consist of normal, abnormal and emergency use of the equipment throughout all flight phases, a variety of take-off and approach conditions and shall include –
- (a) pilot seat adjustment to attain and maintain appropriate viewing angles and verification of HUD operating modes;
 - (b) operations during critical flight events (ACAS TA/RA, upset and wind shear recovery, engine or system failure, etc.);
 - (c) crew co-ordination, monitoring and verbal call-out procedures for single HUD installations with head-down monitoring for pilot-not-equipped with HUD and head-up monitoring for pilot-equipped with HUD;
 - (d) crew co-ordination, monitoring and verbal call-out procedures for dual HUD installations with use of the HUD by the pilot flying the aircraft and either head-up or head-down monitoring by the other pilot; and
 - (e) use during low visibility operations, including taxi, take-off, instrument approach and landing in both day and night conditions. This training should include the transition from head-down to head-up and head-up to head-down operations.

3. Enhanced vision systems

- (1) Enhanced vision systems (EVS) allow the pilot to view an image of the external scene obscured by darkness or other visibility restrictions which –
 - (a) may improve situational awareness;
 - (b) may allow pilots to detect terrain or obstructions on the runway or taxiways;
 - (c) may provide visual cues to enable earlier runway alignment and a more stabilised approach; and
 - (d) may also be used to obtain approval to use reduced visibility minima when the images are presented into the pilot's external field of view on a HUD without significantly restricting that view.

- (2) For a Corporate Aviation Operator who wishes to use EVS in IFR flight, EVS ground training shall be accomplished at an ATO or as part of an approved training programme. The programme shall include, as a minimum, the following –
 - (a) an understanding of the system characteristics and operational constraints;
 - (b) normal procedures, controls, modes and system adjustments;
 - (c) EVS limitations;
 - (d) failure modes of the EVS and the impact of the failure modes or limitations upon crew performance, in particular, for two-pilot operations; and
 - (e) any effects that weather, such as low ceilings and visibilities, may have on the performance of an EVS.

- (3) For a Corporate Aviation Operator who wishes to use EVS in IFR flight, flight training shall be accomplished using an aircraft or FSTD equipped with the same type of EVS to be used in the aircraft. The training shall consist of normal, abnormal and emergency use of the equipment throughout all flight phases, a variety of approaches and take-off conditions and shall include –
 - (a) enhanced vision display during low visibility operations, including taxi, take-off, instrument approach and landing and system use for instrument approach procedures in both day and night conditions;
 - (b) crew co-ordination and monitoring procedures and pilot call-out

responsibilities;

- (c) transition from enhanced imagery to visual conditions during the runway visual acquisition; and
- (d) rejected landing due to loss of visual cues of the landing area, touchdown zone or rollout area.

4. HUD, EVS and NVG approval

- (1) Operational and airworthiness approval for the use of a HUD, EVS or NVG in IFR flight or at night shall be obtained.

Note: Specifications for NVG need still to be developed.

- (2) 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.
- (3) HUD, EVS or NVG, as applicable, installed in aircraft in the State of Manufacture shall meet the airworthiness requirements of such State. Provided an owner or operator can submit evidence of meeting the requirements of the State of Manufacture, airworthiness approval for the use of the HUD or EVS, as applicable, in that aircraft shall be given.
- (4) Prior to installing a HUD, EVS or NVG, as applicable, as a retrofit, an owner or operator shall contact the SACAA to determine the airworthiness requirements associated with its approval for use.
- (5) An airworthiness approval issued to an operator for an aircraft shall be valid for any other aircraft of the same type operated by such operator: Provided the HUD, EVS or NVG equipment, as applicable, is the same in each aircraft.
- (6) An airworthiness approval issued to an aircraft type may be extended to other aircraft types: Provided the Director is of the opinion that the other aircraft types have sufficient commonality with the approved aircraft and the HUD, EVS or NVG equipment, as applicable, is the same in all the aircraft.
- (7) Pilots shall pass a knowledge test following the ground training and a skills test following the flight training, both of which shall be administered by the operator or an authorised person. Upon successful completion of the skills test, the operator or crew member shall record the qualification to operate with a HUD, EVS or NVG, as applicable, in his or her training records.

- (8) Annual recurrent training in the use of HUD, EVS or NVG, as applicable, shall be accomplished.

93.07.24 OPERATIONS WITH ELECTRONIC FLIGHT BAGS

1. Introduction

- (1) This TS provides guidance for the approval for use of installed and portable electronic flight bags (EFB).
- (2) Installed EFBs may be incorporated during the aircraft type design, by a change to the type design or added by a supplemental type certificate.
- (3) Portable EFBs are not considered to be part of the certified aircraft configuration and do not require airworthiness approval.

Note – Refer to section 2 for additional information concerning portable EFBs.

2. Airworthiness approval

- (1) Portable EFBs that do not require airworthiness approval –
- (a) are generally commercial-off-the-shelf (COTS)-based computer systems used for aircraft operations (e.g. laptop, tablet PC);
- (b) are not attached to an aircraft mounting device;
- (c) are considered to be a controlled portable electronic device (PED);

Note – A controlled PED is a PED that is subject to administrative control by the company. This will include, inter alia, tracking the location of the devices to specific aircraft or persons and ensuring that no unauthorised changes are made to the hardware, software or databases. A controlled PED will also be subject to procedures to ensure that it is maintained to the latest amendment state.

- (d) may only connect to aircraft power through a certified power source;

Note – The EFB power source should be designed such that it may be deactivated at any time. Where there is no possibility for the flight crew to quickly remove or unplug the power to the EFB system, a clearly labelled and conspicuous means (e.g. on/off switch) should be provided. Circuit breakers are not to be used as switches; their use for this purpose is prohibited.

- (e) are normally without aircraft data connectivity except under specific conditions; and

Notes – Data connectivity of the EFB to other aircraft systems is not authorised except if the EFB system is connected to –

1. a system completely isolated from the avionics/aircraft systems (e.g., EFB system connected to a transmission medium that receives and transmits data for Aircraft Administrative Communications (AAC) purposes for usage on the ground only); and
2. a certified data link to receive data only from aircraft systems, where the data link, through the certification process, has an approved security device to protect the aircraft systems from receiving any data from the EFB system and from the installation or use of unauthorised applications and data. Through the certification process, this data link should also have been demonstrated to protect the installed aircraft systems from adverse effects due to EFB system failures. Subject to the above provisions, there is no further evaluation required when connecting the EFB system to the aircraft data link port.

- (f) shall be secured during critical phases of flight.

- (2) Even though portable EFBs do not require an airworthiness approval as they are “non-installed equipment”, EMI demonstrations, batteries/power sources, data connectivity and rapid depressurisation shall be assessed if the Director so determines.
- (3) For EFBs other than those addressed in subsection (1), the entire EFB, or some elements of the EFB, shall require an airworthiness approval. Elements to be subject to airworthiness approval are determined upon analysis of their interface with aircraft systems and equipment. These EFBs shall be included as part of the minimum equipment list (MEL), if applicable.
- (4) EFBs integrated into the aircraft as part of its initial design or installed later as a retrofit in accordance with the requirements of the State of Manufacture shall be given approval: Provided the operator can submit evidence of having met the requirements of the State of Manufacture.
- (5) For aircraft without the evidence specified in subsection (4), an operator shall contact the SACAA to determine the airworthiness requirements associated with its approval for use prior to installing an EFB as a retrofit.

3. Operational approval

- (1) An operator transitioning to a paperless flight deck (i.e., removal of charts, manuals, etc.) shall complete the requirements specified in subsections (2) to (6), inclusive, prior to operating with an EFB.
- (2) Operational approval is contingent on the operator or responsible person completing ground training for personnel using the EFB system. The programme shall include, as a minimum –
 - (a) an overview of the system architecture;
 - (b) pre-flight checks of the system;
 - (c) limitations of the system;
 - (d) the use of each operational function on the EFB;
 - (e) restrictions on the use of the system, including when some or all of the EFB functions are not available;
 - (f) the conditions, including phases of flight, under which the EFB should not be used;
 - (g) procedures for cross-checking data entry and computed information;
 - (h) human performance considerations on the use of the EFB; and
 - (i) additional training for new applications, new features of current applications or changes to the hardware configuration.
- (3) EFB operations with no paper backup shall have a means of mitigation against the effects of a failure or malfunction of the EFB. Mitigation against EFB failure or impairment may be accomplished by a combination of –
 - (a) system design;
 - (b) separate and backup power sources for the EFB;
 - (c) redundant EFB applications hosted on different EFB platforms;
 - (d) paper products carried by selected crew members;
 - (e) complete set of paper backups on the flight deck; and/or

- (f) procedural means.
- (4) The operator or responsible person shall assign responsibility for the administration and physical control of EFBs and the associated software; in particular, the activation of amendments to the hardware and software.
- (5) The operator or responsible person shall ensure that the EFB is protected from unauthorised intervention.
- (6) The operator or responsible person shall ensure that the EFB is maintained in accordance with the manufacturer's recommended programme. The operator or responsible operator shall establish procedures for action to be taken when an EFB is out of service unless provided for in a MEL.
- (7) Prior to use of a portable EFB, an assessment shall be made of how the device will be used on the flight deck. Safe stowage, crashworthiness, security and use under normal environmental conditions, including turbulence, shall be addressed by the operator.
- (8) Whether the EFB is portable or integrated with the aircraft, the operator shall carry out an assessment of the human-machine interface and aspects of crew co-ordination when using the EFB. Whenever possible the EFB/user interface should be consistent with, but not necessarily identical to, the flight deck design philosophy. The assessment should include –
- (a) general considerations including flight crew member workload, integration of the EFB into the flight deck, display and lighting issues, system shutdown and system failures;
- (b) physical placement issues, including stowage area, use of unsecured EFBs, design and placement of the mounting cradle;
- (c) consideration of possible interference with aircraft controls, outside vision, view of other flight deck displays, oxygen mask access, egress, crew cooling and speaker sound;
- (d) software considerations, including ease of access to common and time-critical system functions, consistency of symbols, terms and abbreviations, legibility of text, system responsiveness, use of colour, display of system status, error messages, management of multiple applications and use of active regions;
- (e) hardware considerations, including controls and input devices and flight crew accessibility to these devices; and

- (f) application-specific considerations, including organisation and appearance of information, system detection of data entry errors and user interaction with applications.
- (9) If an EFB generates information similar to that provided by existing flight deck systems, procedures should clearly identify –
- (a) which information source will be primary;
 - (b) which source will be used for back-up information;
 - (c) under what conditions the back-up source will be used; and
 - (d) what actions will be taken when information provided by an EFB does not agree with that from other flight deck sources or, if more than one EFB is used, when one EFB disagrees with another.
- (10) Upon receiving airworthiness approval and meeting the requirements of subsections (2) to (9), inclusive, the operator or PIC shall undergo a six-month self-evaluation period during which paper backups of the materials on the EFB shall be carried. The back-up paper materials shall be readily available to the flight crew members during flight time.
- (11) If, following the six-month evaluation period, the operator or PIC is satisfied that the equipment and procedures are adequate and the crew members, maintenance personnel and other persons involved in the use of the EFB are sufficiently trained and knowledgeable, the operator or PIC shall submit a request to the SACAA seeking approval to use the EFB.
- (12) The SACAA assessment of an application to use EFBs will be based upon –
- (a) confirmation that the requirements of subsections (2) to (9), inclusive, have been met;
 - (b) a demonstration of system reliability and that information provided will not be inaccurate or misleading;
 - (c) that the operator or responsible person has established a means to carry out quality assurance approval of data content prior to installation on the EFB; and
 - (d) satisfactory completion of a demonstration flight using the EFB.
- (13) The authorisation to use EFBs shall contain any restrictions or limitations that the Director deems necessary in the interests of safety.

- (14) If the EFB provides electronic displays that replace paper products formerly required for safe flight operations or is a source for other required information or displays, corporate aviation operators shall describe EFB operations in the operations manual.

93.07.26 CARRY-ON BAGGAGE

1. Procedures for stowing of carry-on baggage

Procedures established by an operator or PIC to ensure that carry-on baggage is adequately and securely stowed shall take account of the following –

- (a) each item carried in a cabin must be stowed only in a location that is capable of restraining it;
- (b) mass limitations placarded on or adjacent to stowages shall not be exceeded;
- (c) underseat stowage areas shall not be used unless the seat is equipped with a restraint bar and the baggage is of such size that it may adequately be restrained by this equipment;
- (d) items shall not be stowed in toilets or against bulkheads that are incapable of restraining articles against movement forwards, sideways or upwards and unless the bulkheads carry a placard specifying the greatest mass that may be placed there;
- (e) baggage placed in lockers shall not be of such size that they prevent latched doors from being closed securely;
- (f) baggage shall not be placed where it will impede access to emergency equipment; and
- (g) checks shall be made before take-off, before landing and whenever the PIC illuminates the fasten seat belts sign, or otherwise so orders, to ensure that baggage is stowed where it cannot impede evacuation from the aircraft or cause injury by falling, or other movement, as may be appropriate to the phase of flight.

93.07.28: BRIEFING OF PASSENGERS

1. Standard safety briefing

The standard safety briefing shall consist of an oral briefing provided by a crew member designated by the PIC or by audio or audio-visual means in at least the English language or as required by the Director, which includes the following

information as applicable to the aircraft, equipment and operation –

(a) prior to take-off –

- (i) when, where, why and how carry-on baggage is required to be stowed;
- (ii) the fastening, unfastening, adjusting and general use of safety belts or safety harnesses;
- (iii) when seat backs must be secured in the upright position and tray tables must be stowed;
- (iv) the location and operation of emergency exits;
- (v) the floor proximity emergency escape path lighting system if applicable;
- (vi) the location, purpose of, and advisability of reading the safety features card;
- (vii) the regulatory prohibition on smoking on board the aircraft at any time;
- (viii) the location of any emergency equipment the passenger may have a need for in an emergency situation such as the ELT, fire extinguisher, survival equipment, including the means to access it if in a locked compartment, first aid kits and life rafts;
- (ix) the use of passenger operated portable electronic devices;
- (x) the location and operation of the fixed passenger oxygen system, including the location and presentation of the masks; the actions to be performed by the passenger in order to obtain the mask, activate the flow of oxygen and correctly don and secure the mask. This briefing may be completed after take-off but prior to reaching 25 000 feet (helicopters: 15 000 feet); and
- (xi) when carried on board, the location, use of and when to inflate life jackets, including how to remove them from stowage/packaging, and a demonstration of the method of donning and inflation. This briefing may be completed after take-off but prior to the overwater portion of the flight;

(b) after take-off –

- (i) that smoking is prohibited; and
- (ii) the advisability of using safety-belts or safety harnesses during flight;

(c) in-flight when the “Fasten Seat Belt” sign has been turned on or other advice of the need to fasten safety harnesses for reasons of turbulence;

(d) prior to landing –

(i) carry-on baggage stowage requirements;

(ii) correct seat back and chair table positioning;

(iii) on flights scheduled for four hours duration or more, the location of emergency exits; and

(iv) the seat belt requirement; and

(e) after landing, prior to gate arrival –

(i) the need to remain seated with their seat belt fastened until the aircraft comes to a full stop at the point of disembarkation; and

(ii) the manner in which they will be assisted or guided to the safest direction and most hazard-free route for passenger movement away from the aircraft following disembarkment.

Note – The safety message of the briefing may not be diluted by the inclusion of any service information, advertising or non-related comments that would affect the integrity of the safety briefing.

2. Individual safety briefing

The individual safety briefing shall include, as applicable to the situation –

(a) any information contained in the standard safety briefing and the safety features card that the passenger would not be able to receive during the normal conduct of that safety briefing; and

(b) additional information to the needs of that person as follows –

(i) the most appropriate brace position for that passenger in consideration of his/her condition, injury, stature and/or seat orientation and pitch;

(ii) the location to place any service animal that accompanies the passenger;

(iii) for a mobility-restricted passenger who needs assistance in moving expeditiously to an exit during an emergency –

- (aa) a determination of what assistance the person would require to get to an exit;
 - (bb) the route to the most appropriate exit;
 - (cc) the most appropriate time to begin moving to that exit; and
 - (dd) a determination of the most appropriate manner of assisting the passenger;
- (iv) for a visually impaired person –
 - (aa) detailed information of and facilitating a tactile familiarisation with the equipment that he/she may be required to use;
 - (bb) advising the person where to stow his/her cane if applicable;
 - (cc) the number of rows of seats between his/her seat and his/her closest exit and alternate exit;
 - (dd) an explanation of the features of the exits; and
 - (ee) if requested, a tactile familiarisation of the exit;
- (v) for a comprehension-restricted person: while using the safety features card, pointing out the emergency exits and alternate exits to use and any equipment that he/she may be required to use;
- (vi) for persons with a hearing impairment –
 - (aa) while using the safety features card, point out the emergency exits and alternate exits to use and any other equipment that the person may be required to use; and
 - (bb) communicating detailed information by pointing, face-to-face communication permitting speech reading, pen and paper, through an interpreter or through their attendant;
- (vii) for a passenger who is responsible for another person on board, information pertinent to the needs of the other person, as applicable –
 - (aa) in the case of an infant –

- (A) seat belt instructions;
- (B) method of holding infant for take-off and landing;
- (C) instructions pertaining to the use of a child restraint system;
- (D) oxygen mask donning instructions;
- (E) recommended brace position; and
- (F) location and use of life preservers, as required;

(bb) in the case of any other person –

- (A) oxygen mask-donning instructions;
- (B) instructions pertaining to the use of a child restraint system;
and
- (C) evacuation responsibilities; and

(viii) for an unaccompanied minor, instructions to pay close attention to the normal safety briefing and to follow all instructions. A passenger that has been provided with an individual safety briefing need not be re-briefed following a change in crew if the crew member that provided the individual safety briefing has advised a member of the new crew of the contents of that briefing, including any information respecting the special needs of that passenger. A passenger may decline an individual safety briefing.

3. Passenger preparation for emergency landing

The emergency briefing provided in the event of an emergency where time and circumstances permit shall consist of instructions pertaining to –

- (a) safety belts/safety harnesses;
- (b) seat backs and chair tables;
- (c) carry-on baggage;
- (d) safety features cards;
- (e) brace position (how to brace, when to assume position, how long to remain);

- (f) if applicable, life preservers;
- (g) location of exits;
- (h) if applicable, evacuation procedures for an occupant of a child restraint system; and
- (i) the removal of any other item that may cause harm to passengers during evacuation; i.e. sharp objects, high heeled shoes, pencils, etc.

93.07.28 SAFETY FEATURES CARD

The safety features card shall contain the following information as applicable to the aircraft and equipment carried –

(a) general safety information including –

- (i) smoking is prohibited on board the aircraft;
- (ii) each type of safety belt or safety harness installed for passenger use, including when to use, and how to fasten, tighten and release;
- (iii) where carry-on baggage must be stowed for take-off and landing and any other related requirements and restrictions pertinent to that particular aircraft; and
- (iv) correct positioning of seat backs and chair tables for take-off and landing;

(b) emergency procedures and equipment including –

(i) fixed passenger oxygen system showing –

(aa) mask location and presentation; the actions to be performed by the seated passenger in order to obtain the mask, activate the flow of oxygen and correctly don and secure the mask; and

(bb) priority for persons assisting others with oxygen;

(ii) for aircraft where cabin crew are not required –

(aa) location of first aid kits;

(bb) location of fire extinguishers that would be accessible to the passengers;

- (cc) location of ELTs; and
- (dd) location of survival equipment and if the stowage compartment is locked, the means of access or location of the key;
- (iii) passenger brace position for impact, as appropriate for each type of seat and restraint system installed for passenger use; including the brace position for an adult holding an infant;
- (iv) the location, operation and method of using each emergency exit type on the aircraft, including identification of those emergency exits known to be rendered unusable in a ditching or because of the aircraft configuration such as a combi configuration;
- (v) the safest direction and most hazard-free escape route for passenger movement away from the aircraft following evacuation;
- (vi) the attitude of the aircraft while floating;
- (vii) location of life jackets or equivalent individual flotation devices and correct procedures for removal from stowage/packaging; donning and use of the life jacket or equivalent individual flotation device for adult, child and infant users, including when to inflate;
- (viii) location and use of life rafts;
- (ix) location, removal and use of flotation devices; and
- (x) the form, function, colour and location of any floor proximity emergency escape path lighting system that is installed; and
- Note – An operator may, if the safety features card provided by the aircraft manufacturer does not depict some or all of the information required by this sub-paragraph, convey the missing information to the passengers by means of an oral briefing.***
- (xi) the safety features card shall be applicable to the aircraft being operated and shall contain only safety information that is –
- (aa) accurate for the aircraft type and configuration in which it is carried and in respect of the equipment carried;
- (bb) presented with clear separation between each instructional procedure. All actions required to complete a multi-action procedure

to be presented in correct sequence and the sequence of actions to be clearly identified; and

(cc) depicted in a clear and distinct manner.

93.08.1 GENERAL REQUIREMENTS

Division 1: Aeroplane Limitations

1. Aeroplane Performance data

(1) Operations Using Other than Approved Performance Data – Contaminated Runway

A PIC may elect to use performance data from a source other than the aeroplane flight manual when operating an aeroplane to or from a contaminated runway: Provided –

- (a) the aeroplane shall be operated in accordance with a contaminated runway operations supplement to the flight manual that has been prepared or approved by the aeroplane manufacturer;
- (b) take-off mass limitations may be based on an engine-out condition using a 15-foot screen height, provided the area to be used for first segment climb contains no obstacles taller than 15 feet;
- (c) where the manufacturer permits, stopping distance calculations may include credit for reverse thrust on the operative engine;
- (d) operation at reduced thrust settings shall not be permitted and V_{mc} shall be based on full-rated thrust;
- (e) the corporate aviation operator's approved operations manual shall set out procedures for operations using contaminated runways; and
- (f) pilot and, where applicable, flight operations officer ground training shall address contaminated runway operations.

(2) Operations Using Other than Approved Performance Data – Reciprocating-Engine Aeroplanes in Cargo-only Operations

A PIC may elect to use performance data from a source other than the aeroplane flight manual when operating a reciprocating-engine aeroplane during cargo-only operations from or to unprepared surfaces: Provided –

- (a) the corporate aviation operator's approved operations manual sets out the programme for operations involving unprepared surfaces. The programme shall include –
 - (i) pilot-in-command training, checking and experience requirements, which shall include –
 - (aa) at least 100 hours on type;
 - (bb) completion of a course of ground and flight training covering topics such as take-off and landing surface characteristics, obstacle assessment and interpretation of pertinent aeroplane data;
 - (cc) completion of at least 25 hours of line induction involving unprepared surface operations; and
 - (dd) passing a line check covering unprepared surface operations;
 - (b) procedures for company operational approval for unprepared surface operations; and
 - (c) procedures for assessing and operating from/to unprepared surfaces and unfamiliar approach and departure routes;
 - (d) for operations in accordance with CAR 93.01.1(1)(a) or (b), the PIC shall comply with the requirements specified in paragraph (a)(i) above.

2. Take-off mass limitations – accelerate-stop distance

A PIC may operate a reciprocating-engine aeroplane where the accelerate-stop distance required exceeds the accelerate-stop distance available: Provided the PIC restricts the aeroplane to no more than 9 passenger seats being occupied.

3. Net take-off flight path – visual obstacle avoidance

A PIC may conduct a departure of an aeroplane without determining net take-off flight path for a reciprocating-engine aeroplane when visual obstacle avoidance is possible: Provided the following conditions are met –

- (a) Obstacle Assessment –
 - (i) the PIC shall obtain the best available data concerning obstacles in the proposed take-off path. Transient obstacles (such as construction equipment or moored watercraft, etc.) shall be considered when they are

- estimated to lie within 300 feet of the centre-line of the proposed take-off path; and
- (ii) where the precise height, bearing and distance of an object is not known (such as objects depicted on a topographical map), the PIC shall use a reasonable estimate for performance calculations. Calculations shall clearly indicate where estimated information is used;
- (b) Departure Planning –
- (i) the person responsible for operations or his/her delegate shall establish a company engine-out departure plan using procedures set out in the approved operations manual. The PIC of an aircraft operating in accordance with CAR 93.01.1(1) (a) or (b) shall establish an engine out departure plan. The plan shall include at least the following –
- (ii) obstacle assessment;
- (iii) aeroplane performance, including turn radii; and
- (iv) visual reference points to be used during the departure route;
- (c) prior to commencing a take-off, the PIC shall, in consideration of the current winds, density altitude and aeroplane mass, satisfy himself or herself that the departure plan to be followed in the event of an engine failure on take-off avoids all obstacles in the departure path by either 35 feet vertically or 300 feet horizontally;
- (d) in considering visual contact with the controlling obstacles during the departure phase, the PIC shall establish, to the satisfaction of the Director, that taking into account flight deck angle and alterations in the field of view during turns, the flight crew will be able to maintain continuous visual contact with all significant obstacles located within the departure route; and the corporate aviation operator shall retain the departure plan for audit purposes.

93.10.1 REQUIREMENTS FOR QUALITY MANAGEMENT SYSTEM (CAOC holder only)

1. Definitions

The terms used in this TS have the following meaning –

“quality manager” means the manager responsible for the implementation, management and monitoring of the quality system and for requesting corrective action;

“audit” means a methodical, planned review used to determine how a business is being

conducted and compares the results with how that business should have been conducted according to regulations and established procedures;

“inspection” means the act of observing a particular event or action, to ensure that correct procedures and requirements are followed during the accomplishment of that event or action. The primary purpose of an inspection is to verify that established standards are followed during the observed event or action; and

“quality assurance (QA)” means all those planned and systematic actions necessary to provide adequate confidence that operational and maintenance practices satisfy prescribed requirements.

2. Quality management system (QMS) requirements

The QMS shall be established –

(a) to ensure the adequacy of operational and maintenance activities in maintaining compliance with requirements, standards and operational procedures;

(b) to specify the basic structure of the quality system applicable to the operation and be structured according to the size and complexity of the operation to be monitored; and

(c) as a minimum, to include the following –

(i) objectives of the QA programme, which shall be –

(aa) written;

(bb) specific, measureable, attainable, realistic and time-based; and performance shall be measured and tracked;

Note – The QA objectives are not simply related to safety goals but are also part of the strategic and business objectives of the organisation;

(ii) how the organisation intends meeting the provisions of the CAR;

(iii) how the operator will meet additional standards and operating procedures;

(iv) drawing up a quality policy statement;

(v) documentation, including manuals, reports, statistics and records

required in support of the QA programme and how they are to be controlled;

(vi) quality processes and procedures to be employed in support of the QA programme;

(vii) monitoring process;

(viii) the procedures to be utilised in effecting the QA programme, including –

(aa) audit procedures;

(bb) reporting procedures; and

(cc) corrective action and verification procedures;

(ix) a system of record keeping; and

(x) a training syllabus.

3. QMS policy

A corporate aviation operator shall establish a formal, written quality policy statement, constituting a commitment by the chief executive officer as to what the quality system is intended to achieve. The quality policy shall –

(a) reflect the commitment to the goal of achieving and continuing with compliance with regulatory requirements together with any additional standards specified by the operator; and

(b) reflect the chief executive officer's commitment to –

(i) appoint resources to manage the system;

(ii) ensure the structure required to meet the goals is established and maintained;

(iii) establish measurable objectives; and

(iv) ensure continual improvement in the QMS.

4. Structure

(1) The chief executive officer shall appoint an accountable QM to manage the system

and who meets the experience and qualifications requirements specified in TS 93.06.3(3).

- (2) The QM shall have direct link to the chief executive officer to discuss QMS matters when required.
- (3) The roles and responsibilities of the QM and all other role players within the QMS shall be defined.
- (4) QA audit responsibilities shall be performed and reported independent from all other line functions within the organisation, except as provided for in section 7 below.
- (5) The structure of the organisation may vary with the size and complexity of the operator but in all cases, the QMS should be developed so as to properly interface internally and with external agencies or service providers with which the company engages

5. Process requirements

- (1) As processes are the means by which the QA goals are meant to be attained, they must be documented, whether written as procedures or mapped in flow chart format, for every significant activity and task within the organisation.
- (2) The inputs, sequential steps and outputs must be shown, and where multiple individuals are involved, responsible for each output.
- (3) Processes shall list –
 - (a) the references that must be consulted in using the process;
 - (b) the records that must be completed as evidence of the process having been followed; and
 - (c) the minimum retention periods for these documents as specified in the document and records control procedures.
- (4) Processes which fall into the following categories of quality control must be –
 - (a) key/core business processes critical to the company's reason for existence. E.g. flight operations, ground operations, maintenance, safety management, etc.;
 - (b) support processes that are developed in support of the core processes, e.g. recruitment, procurement, etc.; and

- (c) quality processes, like auditing, management review of the system, document control, records control, measurement of objectives, measurement of the ability of processes to achieve their intended result, data analysis corrective action and preventive action.

6. Documentation

- (1) Except as provided in subsection (3), the QMS must be supported by a quality management manual (QMM) either as a part of the operations manual system or a stand-alone document, the contents of which shall include –

- (a) the system of amendment and revision –

- (i) the procedure for amending the manual, including temporary revisions;
- (ii) who is responsible for the issuance and insertion of amendments and revisions;
- (iii) a record of amendments and revisions with insertion dates and effective dates;
- (iv) a description of the system for the annotation of pages and their effective dates;
- (v) a list of effective pages; and
- (vi) a description of the distribution system for the manual, amendments and revisions;

- (b) the company's policy statement;

- (c) the company's structure;

- (d) the company's objectives;

- (e) the roles, duties and responsibilities of the company's key personnel, including the chief executive officer and QM. Where there is more than one QM, the mandate and specific functions of each and the interrelationship between them must be clearly identified; and

- (f) the procedures/processes whether written or mapped (some companies include only high level cross-departmental processes in the QMM and others include all processes in their QMM – they would end up with a series of manuals). Detailed manuals are normally the responsibility of the line managers but they still form part of the QMS and will fit into the QMS to meet

requirements.

- (2) In addition, the following documentation, usually residing in the QMM, shall be prepared and used within the QMS –
- (a) forms and checklists that have to be used in the execution of the processes;
 - (b) a list of records used in the system;
 - (c) a list of forms used in the system;
 - (d) a list of registers or software systems in use as support to the system; and
 - (e) a list of external documents that impact on the system (called references).
- (3) The information required by subsection (1) may be included in the corporate aviation operator's safety management manual (SMM) or operations manual if the company's size and complexity are such that a separate manual is not required.

7. Quality Manager

- (1) In the case of small and very small operators, the post of the QM may be combined or outsourced subject to the approval of the Director. However, in such event, independent personnel should conduct the quality inspections and audits.
- (2) The specific duties and responsibilities of the QM will vary in relation to the size and complexity of the company but shall be identified in the QMM or other manual, if a separate QMM is not produced.

8. Quality Management System

- (1) A QMS shall include a quality assurance programme that includes all planned and systematic actions necessary to provide confidence that all operations and maintenance are conducted in accordance with all applicable requirements, standards and operational procedures. A quality assurance programme should, at least, include the following –

(a) Inspections

The primary purpose of a quality inspection is to observe a particular event/action/document, etc., in order to verify whether established operational procedures and requirements are followed during the accomplishment of that event and whether the required standard is achieved. To the extent conducted by the operator, quality inspections shall include –

- (i) flight operations;

- (ii) ground de-icing/anti-icing;
- (iii) flight support services;
- (iv) load control;
- (v) maintenance;
- (vi) technical standards; and
- (vii) training standard;

(b) Audits

- (i) Audits shall include quality procedures and processes covering at least the following –
 - (aa) a statement explaining the scope of the audit;
 - (bb) planning and preparation;
 - (cc) gathering and recording evidence; and
 - (dd) analysis of the evidence; and
- (ii) Audit techniques shall include –
 - (aa) interviews or discussions with personnel;
 - (bb) a review of published documents;
 - (cc) the examination of an adequate sample of records;
 - (dd) the witnessing of the activities which make up the operation; and
 - (ee) the preservation of documents and the recording of observations;

(c) Auditors

- (i) Auditors should not have any day-to-day involvement in the area of the operation and/or maintenance activity which is to be audited. An operator may, in addition to using the services of full-time dedicated personnel belonging to a separate quality department, undertake the monitoring of specific areas or activities by the use of part-time or external auditors;
- (ii) An operator whose structure and size does not justify the establishment of full-time auditors may undertake the audit function by the use of part-time personnel from within his or her own organisation or from an external source under the terms of an agreement acceptable to the Director. In all cases, the operator should develop suitable procedures to ensure that persons directly responsible for the activities to be audited are not selected as part of the auditing team;
- (iii) Where external auditors are used, it is essential that any external specialist is familiar with the type of operation or maintenance conducted by the operator;

- (iv) The operator's quality assurance programme shall identify the experience levels of persons within the company responsible and authorised to –
 - (aa) perform quality inspections and audits as part of on-going quality assurance;
 - (bb) identify and record any concerns or findings, and the evidence necessary to substantiate such concerns or findings;
 - (cc) initiate or recommend solutions to concerns or findings through designated reporting channels;
 - (dd) verify the implementation of solutions within specific timescales; and
 - (ee) report directly to the QM;

(d) Audit Scope

Operators are required to monitor compliance with the operational procedures they have designed to ensure safe operations, airworthy aircraft, and the serviceability of both operational and safety equipment. In so doing, they should as a minimum and where appropriate, monitor the following –

- (i) the organisation
- (ii) plans and company objectives;
- (iii) operational procedures;
- (iv) flight safety;
- (v) operator certification (CAOC/Operations Specifications);
- (vi) supervision within the organisation;
- (vii) aircraft performance;
- (viii) all-weather operations;
- (ix) communications and navigational equipment and practices;
- (x) mass, balance and aircraft loading;
- (xi) instruments and safety equipment;
- (xii) manuals, logs and records;
- (xiii) aircraft maintenance/operations interface;
- (xiv) use of the MEL;
- (xv) maintenance programmes and continued airworthiness;
- (xvi) airworthiness directives management;
- (xvii) maintenance accomplishment;
- (xviii) defect deferral;
- (xix) flight crew;
- (xx) operational control personnel;
- (xxi) dangerous goods;
- (xxii) security;

- (xxiii) training; and
- (xxiv) safety management system.

(e) Audit Scheduling

A quality assurance programme shall include a defined audit schedule and a periodic review-cycle, area by area, with consideration being given to the following factors –

- (i) the schedule should be flexible and allow unscheduled audits when trends are identified. An operator should establish a schedule of audits to be completed during a specified calendar period. All aspects of the operation shall be reviewed within every period of 12 months in accordance with the programme unless an extension to the audit period is accepted by the Director;
- (ii) an operator may increase the frequency of audits at his or her discretion but shall not decrease the frequency unless accepted by the Director. It is considered unlikely that an interval between audits greater than 24 months would be acceptable;
- (iii) follow-up audits should be scheduled when necessary to verify that corrective action was carried out and that it was effective; and
- (iv) the operator's defined audit schedule can be affected by significant changes to the management, organisation, operation or technologies, as well as changes to the regulatory requirements, resulting in the requirement for an ad hoc audit.

(f) Monitoring

- (i) The aim of monitoring within the quality system is to investigate and judge its effectiveness and thereby to ensure that defined policy and operational and maintenance standards are continuously complied with. Monitoring activity is based upon quality inspections, audits, corrective action and follow-up; and
- (ii) The operator shall establish and publish a procedure to monitor regulatory compliance on a continuing basis. This monitoring activity shall be aimed at eliminating the causes of unsatisfactory performance;

(g) Corrective Action

The quality assurance programme shall include procedures to ensure that

corrective actions are taken in response to findings. These quality procedures should result in the monitoring of such actions to verify their effectiveness as having been rectified. The procedures and responsibilities associated with a corrective action programme are –

- (i) subsequent to the quality inspection/audit, the operator shall establish –
 - (aa) the seriousness of any findings and any need for immediate corrective action;
 - (bb) the origin of the finding;
 - (cc) which corrective actions are required to ensure that the non-compliance does not recur;
 - (dd) a schedule for corrective action;
 - (ee) the identification of individuals or departments responsible for implementing corrective action; and
 - (ff) allocation of resources by the chief executive officer, where appropriate; and
- (ii) the QM shall –
 - (aa) verify that corrective action is taken by the manager responsible in response to any finding of non-compliance;
 - (bb) verify that corrective action includes the elements outlined in subsection (1)(g)(i) above;
 - (cc) monitor the implementation and completion of corrective action;
 - (dd) provide management with an independent assessment of corrective action, implementation and completion; and
 - (ee) evaluate the effectiveness of corrective action through the follow-up process;

(h) Follow-up

Follow-up is a mandatory part of the QA process to ensure that each finding of non-compliance has been resolved satisfactorily and that the resultant solution is effectively implemented, such that a re-occurrence of the situation leading to the

non-compliance is not or is highly unlikely to recur. Follow-up requires at least an inspection of the area identified as being non-compliant but may require a more in-depth audit to ensure a satisfactory resolution of the issue.

(i) Management Evaluation

Management evaluation is a comprehensive, systematic, documented review by the management of the quality system, operational policies and procedures and should include the following –

- (i) the results of quality inspections, audits and any other indicators;
- (ii) the overall effectiveness of the management organisation in achieving stated objectives;
- (iii) consideration of conclusions and recommendations made as a result of an evaluation submitted in writing to the responsible manager for action; and
- (iv) the frequency, format and structure of internal management evaluation activities;

(j) Records

The operator shall maintain accurate, complete and readily accessible records documenting the results of the quality assurance programme. The following records shall be retained for a period of at least five years –

- (i) audit schedules;
- (ii) quality inspection and audit reports;
- (iii) responses to findings;
- (iv) corrective-action reports;
- (v) follow-up and closure reports; and
- (vi) management evaluation reports.

(2) Where an operator decides to sub-contract out operationally significant activities to external agencies for the provision of services, the QA programme must include an examination of such sub-contractors to ensure that the standard of service and product provided, meets with regulatory standards while safety must be ensured.

(3) Operators operating five (5) or less aircraft of the same type category or three (3) or less aircraft of different type categories, may consider the following when establishing a QA programme, provided that the Director may require operators to implement a more advanced QA programme, based on routes and/or frequency operated –

- (a) Operators would tailor their quality systems to suit the size and complexity of their operation and allocate resources accordingly.
- (b) it may be appropriate to develop a quality assurance programme that employs a checklist. The checklist should have a supporting schedule that requires completion of all checklist items within a specified timescale, together with a statement acknowledging completion of a periodic review by top management. An occasional independent review of the checklist content and achievement of the quality assurance should be undertaken; and
- (c) the operator may decide to use internal or external auditors or a combination of the two. In these circumstances it would be acceptable for external specialists and/or qualified organisations to perform the quality audits on behalf of the quality manager. If the independent quality audit function is being conducted by external auditors, the audit schedule should be shown in the relevant documentation.

(4) A QA programme shall include a training programme that provides the following –

- (a) for those responsible for managing the quality system, receive training covering at least –
 - (i) an introduction to the concept of the quality system;
 - (ii) quality management;
 - (iii) the concept of quality assurance;
 - (iv) quality manuals;
 - (v) audit techniques;
 - (vi) reporting and recording; and
 - (vii) the way in which the quality system will function in the organisation;
- (b) for those involved in the inspection or audit functions, training covering at least =
 - (i) an introduction to the concept of the quality system;
 - (ii) the concept of quality assurance;
 - (iii) reporting and recording; and
 - (iv) audit techniques; and
- (c) a briefing to the remainder of the employees consisting of background information about the QA programme and their role in maximising safety and efficiency in the organisation. The allocation of time and resources should be governed by the size and complexity of the operation concerned.

Amendment of Document SA-CATS 121

5. Document SA-CATS 121 is hereby amended by the repeal of technical standards 121.10.3 and 121.10.4.

Amendment of Document SA-CATS 135

6. Document SA-CATS 135 is hereby amended by the repeal of technical standards 135.10.2 and 135.10.4.

Substitution of Document SA-CATS 140

7. The following technical standard is hereby substituted for Document SA-CATS 140:

“SA-CATS 140: SAFETY MANAGEMENT

List of technical standards

140.01.2 ESTABLISHMENT OF SAFETY MANAGEMENT SYSTEM

1. General
2. Requirements for a safety management system manual

140.01.3 REQUIREMENTS OF SAFETY MANAGEMENT SYSTEM

1. Minimum standards for the safety management system
2. Components and elements of a safety management system
3. Requirements of safety management system training programme
4. Qualifications of the safety manager

140.02.2 MANDATORY OCCURRENCE REPORTING

1. Form and manner of reporting

140.01.2 ESTABLISHMENT OF SAFETY MANAGEMENT SYSTEM

1. General

- (1) The entities must establish a safety management system as prescribed in the CAR 140.01.2 and these technical standards, in a format acceptable to the Director, for the control and supervision of the services covered by the operation.

- (2) In addition, in respect of an aerodrome, to the extent that there is no conflict with these technical standards, the requirements as further prescribed in ICAO Doc 9774.
- (3) While it is accepted that the entity's safety management system (SMS) will be developed in accordance with the scope, size and complexity of the operator, every SMS must be capable of delivering compliance with CAR Part 140 and these technical standards at a level commensurate with size and complexity of the operator.
- (4) An entity shall perform a gap analysis to assess the current state of safety management system and devices implementation plan to address any identified deficiencies, detailing the implementation of missing components or elements of SMS. Implementation plan must be acceptable to the Director.
- (5) The 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, upon request of the person providing information, of a means of assuring anonymity and protection.
 - (c) a safety programme to monitor, on a continuous basis, the safety programme being implemented and provide critical assessment as to the effectiveness of the programme. The entities referred to in CAR 140.01.1 (2) may combine safety and quality functions in one office.

Note: Further guidance on ICAO requirements, which have been incorporated into this technical standard, is contained in ICAO Doc 9859.

2. Requirements for Safety Management System Manual

2.1 Safety Management System Manual (SMSM) and Documents

- (1) Dependent upon the scope, size and complexity of the operator, a number of documents may be required to implement and control the SMS. These documents become part of the larger manual system falling under the control of the entity's manual system referred to in subsection 2.8 below.
- (2) Except as noted in these technical standards, all documents generated for the SMS must be consistent with the established policies and procedures published in the relevant regulations in the entity's operations manual/s.

2.2 Use of Third Party Generated SMSM

Safety management system manuals developed by third parties must be presented for the Director's approval using the same establishment and amendment procedures approved for the entity's operations manual.

2.3 Principle of Operational Control

- (1) Where applicable, it is vital that the principle of operational control and supervision be maintained.
- (2) Operational control is the legal responsibility of the entity's operations manager as laid down in applicable regulations and this principle of authority must be maintained notwithstanding any responsibilities, policies and procedures, or reporting relationships established for the SMS programme.

2.4 Development criteria of an SMSM

The information contained in the SMSM and other SMS documents must use a common layout, language, definitions and format as have been approved for the operations manual.

Notes –

1. Where a SMSM is produced in electronic format it must employ a means of ensuring ease and speed of access to the information at least equivalent to hard copy manuals. Electronic manuals must also employ an information pick list, be appropriately hyper-linked and provide a search engine that will provide logical access to all time-critical, emergency, abnormal or other information as deemed appropriate by the Director. Where electronic manuals are used the bulletin system intended to provide quick dissemination of information shall be produced in both electronic and hard copy.
2. An operator may not introduce electronic manuals until the intended user groups have been equipped and trained in the use of the electronic system.

2.5 Organization

- (1) Information relating to safety policies and procedures shall be organized according to criteria which ensure quick and easy access to information required for operations. This is particularly important for flight, cabin, technical and ground operations of operators.
- (2) Distribution and revision of operational documents shall be in the same manner as provided for in the operations manual except where the urgent issue of safety related information or procedures necessitates a non-standard distribution of revision procedure. Such procedure shall be described in the operations manual. Information contained in a safety document system should be grouped according to the importance and use of the information, as follows –

- (a) time critical information, e.g. information that if not immediately available could jeopardize the safety of the operation;
- (b) time sensitive information, e.g. information that if not available in a quick and easy manner could affect the level of safety or delay the operation;
- (c) frequently used information; e.g. information that while not directly affecting safety is required for operational or safety considerations;
- (d) reference information, e.g. information that is required for the operation but does not fall under (b) or (c) above; and
- (e) information that can be grouped based on the phase of operation in which it is used. e.g. Pre-flight, the various flight profiles, post flight, report writing etc.

Notes –

- 1. Time critical information should be placed early and prominently in the safety documents
- 2. Time critical information, time sensitive information, and frequently used information should be placed in quick-reference sections, guides and checklists.

2.6 Design

- (1) An SMSM shall be suitably divided and indexed so as to provide quick and easy access to the information contained therein (See subsection 2.8 below).
- (2) Notwithstanding the foregoing where deemed necessary certain pages, or bulletins, produced under the authority of the operations, or safety manual, may be developed or designed in a manner so as to be conspicuous for easy recognition of their significance.

2.7 Manual indexing and control

- (1) Where the SMSM consists of more than one safety manual, a comprehensive master index must be included in the manual detailing the list of manuals comprising the SMSM.
- (2) Manual control for each manual in the system shall be in the same manner as approved for the operations manual; e.g. page numbering, list of effective pages, amendment instructions, etc.

Note — The master index must be placed in the front of each document.

2.8 Use of SMSM

- (1) Operators or entities must monitor the use of the SMSM to ensure the procedures are appropriate and realistic, based on the characteristics of the operational environment, and are both operationally relevant and beneficial to operational personnel.
- (2) This monitoring should include a formal feedback system for obtaining input from operational personnel. Those portions of the SMSM that provide information with respect to the operations must be available to the appropriate crew members/staff on duty.

2.9 Amendments

- (1) SMSM shall employ the manual amendment procedures approved for the operations manual. For revision planning, entities should develop an information gathering, review assessment and distribution control system to prioritise the amendment process.
- (2) Information and data obtainable from all sources relevant to the type of operation conducted, including, where applicable, any other State where similar aircraft or aviation operations take place, as well as manufacturer and equipment vendors, shall form part of the entity's amendment research process.
- (3) Amendment procedures must include a tracking system to ensure currency by operational personnel. The tracking system should include a procedure to verify that operational personnel have the most recent updates.

2.10 Mandatory amendments

- (1) The entity must ensure their information gathering, review and assessment process also focuses on information resulting from changes that originate from within the entity. Mandatory amendments shall be incorporated for at least the following situations –
 - (a) changes in scope of entity's certificate;
 - (b) whenever deemed necessary by the Director.

2.11 SMSM review schedule

- (1) Operators must publish their SMSM review schedule and ensure their SMSMs are reviewed –
 - (a) on a regular basis (at least once in two years);

- (b) after major events (mergers, acquisitions, rapid growth, downsizing, etc.);
- (c) after changes in safety regulations, or any time so directed by the Director.

140.01.3 REQUIREMENTS OF SAFETY MANAGEMENT SYSTEM

1. Minimum standards for a safety management system

- (1) This section prescribes the requirements of a safety management for the entity listed in CAR 140.01.1.
- (2) A description of the safety management system established in terms of subsection (1) by the entity, to the satisfaction of the Director, for the control and supervision of the services covered by the operation, shall include –
 - (a) the identification of safety hazards and incidents;
 - (b) remedial action necessary to maintain an acceptable level of safety;
 - (c) continuous monitoring and regular assessment of the safety level achieved;
and
 - (d) continuous improvement to the overall level of safety.
- (3) The safety management system shall clearly define lines of safety accountability throughout the aviation operation, including a direct accountability for safety for senior management.
- (4) The safety management system must include the following minimum standards:
 - (a) a clear definition of the level of safety that the operator intends to achieve;
 - (b) proof by the approved entity or operator to the Director that adequate safety measures to maintain the required level of safety will be or are instituted;
 - (c) the components and elements described in section 2 below.

2. Components and elements of a safety management system

2.1 Safety Policy & Objectives

- (1) Safety policy that outlines the principles, processes and methods of entity's SMS to achieve the desired safety outcomes. The policy establishes senior management's commitment to incorporate and continually improve safety in all aspects of its activities.

- (2) The safety policy shall be documented and signed off by the accountable manager.
- (3) Safety objectives must be further enhanced with the establishment of specific safety performance indicators and targets that the entity intends to achieve.
- (4) Safety objectives, indicators and targets must be accepted by the Director and the entity must maintain sufficient records to prove that they monitor their performance against their safety performance targets.
- (5) The safety policy shall entail the following:

(a) Management commitment and responsibility

An entity shall define its safety policy in accordance with international and national requirements. The safety policy shall:

- (i) reflect entity's commitment regarding safety;
- (ii) include a clear statement about the provision of the necessary resources for the implementation of the safety policy;
- (iii) include safety reporting procedures;
- (iv) clearly indicate which types of behaviours are unacceptable related to the entity's aviation activities and include the circumstances under which disciplinary action would not apply;
- (v) be signed by the accountable executive of the organization;
- (vi) be communicated, with visible endorsement, throughout the entity; and
- (vii) Be reviewed every two years to ensure that it remains relevant and appropriate to the operator.

(b) Safety accountabilities

An entity shall –

- (i) identify the accountable manager who, irrespective of other functions, has ultimate responsibility and accountability, on behalf of the entity, for the implementation and maintenance of the SMS. The safety manager or officer shall report directly to the accountable manager of an entity as to maintain independence from the operations.
- (ii) clearly define lines of safety accountability throughout the entity, including a direct accountability for safety on the part of senior management and clearly identifying the reporting line of the safety manager or officer;

- (iii) identify the accountabilities of all members of management, irrespective of other functions, as well as of employees, with respect to the safety performance of the SMS;
- (iv) document and communicate safety responsibilities, accountabilities and authorities throughout the organization; and
- (v) define the levels of management with authority to make decisions regarding safety risk tolerability.

2.2 Appointment of key safety personnel

- (1) An entity shall appoint a safety manager who is responsible for the implementation and maintenance of an effective SMS.
- (2) An entity shall appoint a safety review committee (SRC) that is chaired by the accountable manager and composed of senior managers, including line managers responsible for functional areas as well as those from relevant administrative departments with the safety manager participating on an advisory capacity. The SRC shall:
 - (a) monitor the effectiveness of the SMS;
 - (b) monitor that any necessary corrective action is taken in a timely manner;
 - (c) monitor safety performance against the organisation's safety policy and objectives;
 - (d) monitor the effectiveness of the organisation's safety management processes which support the declared corporate priority of safety management as another core business processes;
 - (e) monitor the effectiveness of the safety supervision of subcontracted operations; and
 - (f) ensures that appropriate resources are allocated to achieve safety performance beyond that required by regulatory compliance.
- (3) Entities referred to in CAR 140.01.1 (1) shall appoint Safety Action Groups (SAG) that deal with specific implementation issues as per direction of the SRC. SAGs are chaired by designated line manager and composed of line managers and front line personnel. The responsibilities of a SAG include –
 - (a) overseeing operational safety performance within the functional areas of the organisation and ensures that appropriate safety risk management activities are carried out with staff involvement as necessary to build up safety awareness;

- (b) coordinating the resolution of mitigation strategies for the identified consequences of hazard and ensures that satisfactory arrangements exist for safety data capture and employee feedback;
 - (c) assessing the safety impact related to the introduction of operational changes or new technologies;
 - (d) coordinating the implementation of corrective action plans and ensures that corrective action is taken in a timely manner;
 - (e) reviewing the effectiveness of previous safety recommendations; and
 - (f) overseeing safety promotion activities as necessary to increase employee awareness of safety issues and to ensure that they are provided appropriate opportunities to participate in safety management activities.
- (4) The functions performed by the safety manager includes –
- (a) managing the operation of the safety management system;
 - (b) collecting and analysing safety information in a timely manner;
 - (c) administering any safety related surveys;
 - (d) monitoring and evaluating the results of corrective actions;
 - (e) ensuring that risk assessments are conducted when applicable;
 - (f) monitoring the industry for safety concerns that could affect the organization;
 - (g) being involved with actual or practice emergency responses;
 - (h) being involved in the development and updating of the emergency response plan and procedures; and
 - (i) ensuring safety-related information, including organizational goals and objectives, are made available to all personnel through established communication processes.
- (5) Notwithstanding the above, an entities' safety manager or officer shall perform the function listed in below dependant on the size, scope and complexity of the operation:
- (a) the establishment and maintenance of mandatory, voluntary and confidential reporting systems to ensure the timely collection of information related to potential hazards, incidents and accidents that may adversely affect safety;
 - (b) the identification of latent hazards and carry out risk management analyses of those hazards;

- (c) the investigation, analysis and identification of the root cause of all hazards or the contributing factors of incidents and accidents identified under the SMS to ensure the operator has adequate mitigation in place;
- (d) the establishment and maintenance of a safety data system, either by electronic or by other means, to monitor and analyse trends in hazards, incidents and accidents;
- (e) the maintenance of a continuous monitoring system that evaluates the results of corrective actions with respect to hazards, incidents and accidents;
- (f) monitor safety concerns in the aviation industry and their perceived impact on the organization's operations aimed at service delivery;
- (g) coordinate and communicate (on behalf of the accountable manager) with the Director and other relevant agencies as necessary on issues relating to safety;
- (h) the co-ordination of the organisation's aviation safety programme and all related safety matters;
- (i) co-operation with the training section with regard to safety training of all the organizations/entity or operators staff for e.g. aerodrome, air navigation, maintenance, design, manufacturing staff flight, cabin and ground crews, as applicable;
- (j) the oversight of aircraft handling regarding matters related to safety in cooperation with ground support services;
- (k) the investigation of all incidents and accidents involving the organisation's/entities or operators aircraft, equipment and property, including fire and emergency procedures, not undertaken in accordance with Part 12;
- (l) the actioning and distribution of accident, incident and other occurrence reports;
- (m) the co-ordination with security personnel to ensure all aspects of security regarding the organisation's aircraft;

- (n) the establishment of an emergency response plan in the event of an accident or serious incident, which includes the actions to be followed by relevant personnel;
- (o) in concert with the person responsible for quality, the maintenance of an integrated safety and quality assurance programme within the organisation and
- (p) promulgation of safety bulletins such as aerodromes, air navigation, maintenance flight, cabin, ground to all staff within the organisation
- (q) conducting meetings with all relevant personnel regarding safety matters;
- (r) maintenance of safety equipment;
- (s) safety audits/inspections or assessment;
- (t) the realisation of other duties may include –
 - (i) occupational health and safety systems
 - (ii) environmental management safety systems.

2.3 Coordination of emergency response planning

- (1) The entity shall ensure that its emergency response plan is properly coordinated with the emergency response plans of those entities it must interface with during provision of its service.
 - (a) The entity shall develop, coordinate and maintain an aviation emergency response plan that ensures orderly and efficient transition from normal to emergency operations, and return to normal operations.
 - (b) Each 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 and required ICAO manuals. (E.g. Aerodrome operators comply with CAR 139.02.7).

2.4 SMS Documentation

- (1) The entity shall develop an SMS implementation plan, formally endorsed by the entity that defines the entity's approach to the management of safety in a manner that meets the entity's safety objectives. The entity's implementation plan shall be based on their gap analysis against CAR 140 requirements, and will clearly describe the entity's approach to the initial implementation of the SMS. The entity shall develop and maintain SMS documentation that describes, where applicable, the following:
 - (a) the safety policy and objectives;

- (b) SMS requirements;
- (c) SMS processes and procedures;
- (d) accountabilities, responsibilities and authorities for SMS processes and procedures;
- (e) SMS outputs;
- (f) scope of the SMS;
- (g) safety accountabilities and responsibilities;
- (h) key safety personnel;
- (i) documentation control procedures;
- (j) safety management policies, procedures and processes;
- (k) coordination of emergency response planning;
- (l) hazard identification and risk management schemes;
- (m) Safety reporting process;
- (n) Flight Data Analysis Program;
- (o) Line Operational Safety Audit Program;
- (p) NOSS program;
- (q) safety assurance;
- (r) safety performance measurement and monitoring;
- (s) safety auditing (internal and external);
- (t) safety surveys;
- (u) safety reviews;
- (v) safety studies;
- (w) safety inspections (internal and external);
- (x) safety investigations;
- (y) management of change;
- (z) safety promotion;
 - (aa) safety communication;
 - (bb) contracted activities;

- (2) The SMS implementation plan of the entity shall explicitly address the coordination between the SMS of the entity and the SMS of other entity's or service providers (that may affect aviation safety and security) with whom the entity may interface during the provision of services, and shall address –
- (a) the SMS standards to be achieved;
 - (b) the accountabilities, responsibilities and authorities for procedures and processes;
 - (c) the SMS areas of responsibilities; and documentation into its operations manual to communicate its approach to safety throughout the operation, including the provision of applicable portions to, for example airports tenants, airlines, maintenance organisations, air navigation services, ground handlers, etc. or in a separately approved SMS manual.

2.5 Safety risk management

- (1) The safety risk management shall include, but is not limited to:-

(a) Hazards and or incidents identification process

- (i) The entity shall develop and maintain a formal process for effectively identifying, collecting, recording, acting on and generating feedback covering hazards/incidents in operations, based on a combination of reactive, proactive and predictive methods of safety data collection.
- (ii) The entity shall implement a mechanism for the timely resolution of safety issues on short and long term basis, where safety issues are proven to be systematic, an effective way of precluding the likelihood of recurrence

Note: *Reactive methods approved entity or operator refers to methods of identifying hazards and or incidents that are based on the investigation of occurrences. Proactive methods aim to use any other information within the entity for the identification of potential hazards and or incidents. Predictive methods rely on data that is collected within the entity that could be used effectively to predict the existence of hazards and or incidents, usually done by trend analysis.*

(b) Risk assessment and mitigation process

- (i) The entity shall develop 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.
- (ii) The following matrixes should be used for purposes of analysing and assessing risk:

Risk Severity Matrix		
Risk Severity definition	Description: Consequence (can lead to)...	Examples of what to look out for...
Category A Catastrophic	multiple deaths & complete loss/ destruction of equipment	A major accident.
Category B Hazardous	Serious injuries/Major Damage to equipment	Large reduction in safety margins, physical distress or workload such that the operators cannot be relied upon to perform their tasks accurately or completely.
Category C Major	Minor injuries/ Minor equipment damage	A significant reduction in safety margins, a reduction in the ability of the operators to cope with adverse operating conditions as a result of increase in workload, or as a result of conditions impairing their efficiency.
Category D Minor	Incidents	Operating limitations are breached. Procedures are not used correctly.
Category E Negligible	Negligible/Inconvenience	Few consequences. No safety consequences. Nuisance.

Risk Probability Matrix		
Likelihood/ Probability Category	Description	Examples of what to look out for
1	Extremely improbable (Rare)	Almost inconceivable that the event will occur.
2	Improbable (Seldom)	Very unlikely that the event will occur. It is not known that it has ever occurred before.
3	Remote (Unlikely)	Unlikely but could possibly occur. Has occurred rarely.
4	Occasional	Likely to occur sometimes. Has

		occurred infrequently.
5	Frequent	Likely to occur many times/regularly. Has occurred frequently/regularly.

RISK PROBABILITY		RISK SEVERITY				
		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

Risk assessment Index	Suggested Criteria
5A, 5B, 5C, 4A, 4B, 3A	Unacceptable under the existing circumstances. Risk mitigation critical.
5D, 5E, 4C, 4D, 4E, 3B, 3C, 3D, 2A, 2B, 2C, 1A	Risk mitigation required. It might require management decision.
3E, 2D, 2E, 1B, 1C, 1D, 1E	Acceptable.

TOLERABILITY DESCRIPTION	ASSESSED RISK INDEX	SUGGESTED CRITERIA
<p>The diagram is an inverted triangle divided into three horizontal sections. The top section is red and labeled 'Intolerable region'. The middle section is yellow and labeled 'Tolerable Region', with a dashed line above it and a box labeled 'CBA' to its left and 'ALARP' to its right. The bottom section is green and labeled 'Acceptable Region', with a dashed line above it. A solid red line is at the very bottom, and a dashed yellow line is just above it.</p>	5A, 5B, 5C, 4A, 4B, 3A	Stop operation or process immediately. Unacceptable under the existing circumstances. Do not permit any operation until sufficient control measures have been implemented to reduce the risk to an acceptable level. Top management approval required
	5D, 5E, 4C, 4D, 4E, 3B, 3C, 3D, 2A, 2B, 2C, 1A	Caution. Ensure that risk assessment has been satisfactorily completed and declared preventive controls are in place. Senior management approval of risk assessment before commencement or continuation of the operation or process.
	3E, 2D, 2E, 1B, 1C, 1D, 1E	May be acceptable with or without review by appropriate management. Requires tracking and possible action. There are acceptable policies and procedures in place, but improvement is possible.

(iii) The following is an example of strategies that can be introduced for mitigation (risk control):

Avoidance	The operation or activity is cancelled because the risks exceed the benefits of continuing the operation or activity.
Reduction	The frequency of the operation or activity is reduced, or action is taken to reduce the magnitude of the consequences of the accepted risks.
Segregation of exposure	Action is taken to isolate the effects of risks or build in redundancy to protect against it.

(iv) Alternative means of analysing, assessing and controlling risk may be implemented by the approved entity or operator with the approval of the Director.

(v) All safety information reported to the Director shall be in the format specified in the above matrixes.

(vi) The approved entity or operator shall also define those levels of management with authority to make decisions regarding the

tolerability/acceptability of safety risks, and the introductions of mitigating measures.

2.6 Safety assurance

(1) Monitoring and measurement of safety performance

- (a) The entity shall develop and maintain the means to verify the safety performance of the operation compared to the safety policy and objectives, and to validate the effectiveness of safety risk controls.
- (b) The entities' safety performance shall be verified in reference to the safety performance indicators and safety performance targets of the SMS established out of data collection.
- (c) The entity shall collect its data to support safety performance indicators. Information sources for safety performance monitoring and measurement, where applicable, shall include the following:
 - (i) Safety occurrence reporting,
 - (ii) Hazard reporting,
 - (iii) Flight Data Analysis Programme
 - (iv) Line Operational Safety Audits
 - (v) NOSS program
 - (vi) Confidential reporting system,
 - (vii) Internal safety investigations,
 - (viii) Safety studies,
 - (ix) Safety reviews, including trend analysis,
 - (x) Internal audits,
 - (xi) External audits,
 - (xii) Risk assessments,
 - (xiii) Employee surveys (safety and culture),
 - (xiv) Employee improvement suggestions,
 - (xv) Interviews and meetings,
 - (xvi) Customer/ stakeholder feedback,
 - (xvii) Competency assessment results.
- (d) The safety reporting procedures relating to safety performance and monitoring shall clearly indicate which types of operational behaviours that are acceptable or unacceptable, and include the conditions under which immunity from disciplinary action would be considered. A non-punitive policy is required to enhance the reporting culture. Immunity from disciplinary action may not be granted in instances of violation and gross negligence.

- (e) The entity shall create an environment where voluntary and confidential reporting mechanisms are established as in addition to the mandatory collection of safety-related information.

(2) The management of change

- (a) The entity shall develop and maintain a formal process to identify changes within the entity which may affect the level of safety risk, established processes and services; to describe the arrangements to ensure safety performance before implementing changes; and to eliminate or modify safety risk controls that are no longer needed or effective due to changes in the operational environment.
- (b) The management of change shall follow a risk based approach as prescribed in subsection 2.5 (1) and safety risk management which includes risk assessments.
- (c) The organisation shall ensure their management of change review and risk assessment process also focuses on the following situations:
 - (i) changes resulting from the installation of new equipment;
 - (ii) new areas of operations, whether geographical or other;
 - (iii) changes in response to operating experience;
 - (iv) changes in an organisation's policies, procedures and manuals;
 - (v) changes in scope of organisations' certificate;
 - (vi) passenger safety information
 - (vii) products or services
 - (viii) operational changes
 - (ix) exemptions or alternative means of compliance
 - (x) for air operators, changes for purposes of maintaining cross fleet standardisation; and
 - (xi) after major events (mergers, acquisitions, rapid growth, downsizing, etc.);
 - (xii) after significant occurrences involving the company or similar companies where unanticipated hazards or incidents were implicated; and
 - (xiii) after changes in relevant applicable safety regulations, or any time so directed by the Director.

(3) Continuous improvement of the SMS

- (a) The entity shall develop and maintain a formal process to identify the causes of sub-standard performance of the SMS, to determine the implications of sub-standard performance in operations, and to eliminate such causes. This may be achieved through audits of the SMS to ensure its effective implementation.
- (b) Entities shall develop a process for conducting periodic scheduled reviews, inspections or audits of SMS not exceeding a 24 month cycle. Such reviews shall include but not limited to safety reporting systems, safety studies, safety reviews, safety audits, safety surveys and occurrence investigations.
- (c) A safety and quality assurance programmes which shall be integrated to monitor on a continuous basis the operational and safety programmes to improve the organization assurance and oversight functions.

2.7 Safety promotion

- (a) **Safety communication** – The entity shall develop and maintain formal means for safety communication that:
 - (i) ensures personnel are aware of the SMS to a degree commensurate with their positions;
 - (ii) conveys safety critical information;
 - (iii) explains any particular safety actions are taken;
 - (iv) explains why safety procedures are introduced or changed;
 - (v) ensures safety promotion;
 - (vi) ensures the advertisement of scheduled of safety meetings and record of such; and
 - (vii) ensures that a procedure for reporting progress to the Accountable manager is in place.

3. Requirements of SMS Training Programme

3.1 Training and education

- (1) The entity shall develop and maintain a safety training programme that ensures that personnel responsible for the associated functions as contained in the SMS are trained and competent to perform their respective duties and thus not compromising SMS goals.

- (2) The entity must ensure that all personnel are provided with safety information appropriate to their identified needs, to the extent of their safety functions and responsibilities.
- (3) Safety training shall be delivered by persons with appropriate knowledge skills, and experience in the applicable subject area

3.2 SMS training programme – Categories

- (1) The entity shall base and develop its SMS training programme around the four components of the ICAO SMS framework and take into account the different levels of knowledge required for the functions of different position within the entity

3.3 In-house SMS levels of training

- (1) When developing SMS training programme, the entity shall take into account the different levels of knowledge and awareness required for the functions and responsibilities of the different staff positions within the entity.
- (2) The four levels of in-house SMS training are:

	<u>Level of training</u>	<u>Recipients</u>	<u>Training Objective</u>	<u>Training content</u>	<u>Recurrence</u>	<u>Level of Instructor</u>
(a)	<u>Aviation Safety content for Induction training.</u>	<u>Non Operational staff within 90 days of service commencement.</u>	<u>To familiarise trainees with the Entities SMS safety policies, objectives and SMS fundamentals.</u>	<ul style="list-style-type: none"> • <u>The Safety Policy and Objectives</u> • <u>Hazards, consequences and risks.</u> • <u>Safety reporting.</u> 	<u>Once off, 1 hour training during induction.</u>	<u>Company Instructor / safety manager/officer personnel or approved Part 141 organisation</u>
(b)	<u>Aviation Safety training for Operational personnel.</u>	<u>Within 90 days All operational staff of entities</u>	<u>To familiarise trainees with the entities safety policies, objectives, their role in hazard identification</u>	<ul style="list-style-type: none"> • <u>The Safety Policy and Objectives</u> • <u>Hazards, consequences and risks.</u> • <u>Safety risk management</u> 	<u>5 hours of training within each three year period</u>	<u>Company Instructor / safety manager/officer personnel or approved</u>

			<u>and risk management and SMS fundamentals.</u>	<u>process, including roles and responsibilities.</u> <ul style="list-style-type: none"> • <u>Safety reporting.</u> • <u>Human factors</u> 		<u>Part 141 organisation</u>
(c)	<u>Safety Review specific training as per CAR Part 141.01.1.(a)</u>	<u>Entities personnel actively involved in the Safety Review Process, including middle, executive/senior management and accountable manager</u>	<u>To familiarise trainees with safety concepts, relevant to their respective roles, functions and responsibilities including compliance with national and organisational safety requirements and inter-departmental safety communication and active promotion of SMS.</u>	<u>In addition to training contents referred to in (b) above, training should include the following:</u> <ul style="list-style-type: none"> • <u>Hazard identification and risk management processes.</u> • <u>Safety data collection and analysis.</u> • <u>Safety roles and responsibilities</u> • <u>Safety assurance and safety promotion</u> • <u>Establishment of safety performance targets, indicators, alerts and safety performance of SMS</u> • <u>The role and responsibilities of Operational management within the SMS.</u> 	<u>5 hours of training within each three year period</u>	<u>Company Instructor/safety manager/officer personnel or approved Part 141 organisation</u>
(d)	<u>Aviation Safety</u>	<u>Safety</u>	<u>Initial training as outlined in</u>	<u>As outlined in section 3.5</u>	<u>Once within</u>	<u>Instructor or</u>

	<u>Management training</u>	<u>manager and approved SMS instructors</u>	<u>section 3.5</u>		<u>each three year period</u>	<u>institution approved by the director or an acceptable aviation Entity.</u>
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3.4 Training documentation

- (1) Training requirements and activities for each level within the entity shall be documented.
- (2) A training file shall be developed for each staff member, including management staff, to assist in identifying and tracking staff safety training requirements and verifying compliance.
- (3) SMS training programmes shall be adapted to fit the needs and complexity of entities' aviation activities

3.5 Safety manager training programme

- (1) The training programme shall include at least the learning content reflected below. The training shall ensure an understanding of the concepts listed as well as the ability to implement and maintain them.

Skill	Learning content
<u>Safety Management</u>	<ol style="list-style-type: none"> 1. <u>Safety concepts, science and philosophy.</u> 2. <u>The history of safety.</u> 3. <u>Safety principles and practices</u> 4. <u>Aviation safety management system</u> 5. <u>Integration within disciplines (flight safety, cabin safety, ground safety, technical safety and emergency response disciplines).</u> 6. <u>Role and functions of the stakeholders</u> 7. <u>Behaviour based safety.</u> 8. <u>Safety compliance and application of requirements</u> 9. <u>Safety manager functions in an organization</u> 10. <u>Safety as a management function</u> 11. <u>Measurement of effectiveness</u> 12. <u>Contractor safety program management</u> 13. <u>Conformance monitoring</u> 14. <u>Development of safety policies, procedures and practices in line with regulations</u> 15. <u>Identify, develop and maintain a risk assessment system</u> <u>Develop risk profile, interpret risk data, producing and presenting recommendations</u> 16. <u>Define and describe safety risk methodology</u> 17. <u>Development of safety performance indicators and targets.</u> 18. <u>Change management.</u> 19. <u>Safety Communication</u>
<u>Safety Legislation</u>	<ol style="list-style-type: none"> 1. <u>Applicable aviation acts and regulations as well as safety acts and regulations</u>
<u>Safety Structure, Responsibilities and Accountability</u>	<ol style="list-style-type: none"> 1. <u>Safety responsibilities and accountability of the various positions within the Organizational structure</u> 2. <u>Developing and implementing an effective aviation safety organizational structure</u> 3. <u>Defining safety responsibilities and accountability</u> 4. <u>Measuring the effectiveness of the safety organization</u>

<u>Safety Risk Management</u>	<ol style="list-style-type: none"> 1. <u>Risk management models</u> 2. <u>Identification of hazards and its consequences.</u> 3. <u>Identification of the risk of consequences in terms of likelihood (probability) and severity (impact)</u> 4. <u>Assessing risk and loss exposures and prioritization</u> 5. <u>Methods for risk control (Mitigation) and prevention strategies</u> 6. <u>Defining Safety hazards</u> 7. <u>Analyzing hazard information from all sources available</u> 8. <u>Determine the probability, frequency and severity of risk occurrence</u> 9. <u>Defences (counter measures/controls) and their role.</u>
<u>Accident / Incident Investigation</u>	<ol style="list-style-type: none"> 1. <u>Concepts covered by Annex 13</u> 2. <u>Accident / incident (occurrence) reporting and its role in the safety management system</u> 3. <u>Investigation of occurrences not required to be investigated by the Accident and Investigation Authority.</u>
<u>Safety Awareness</u>	<ol style="list-style-type: none"> 1. <u>Defining requirements for safety awareness (who, what, when, how)</u> 2. <u>Means for improving awareness.</u> 3. <u>Identification of media and means available</u> 4. <u>Planning for delivery of a safety awareness project</u>
<u>Safety Research</u>	<ol style="list-style-type: none"> 1. <u>Process of safety research</u> 2. <u>Sources of information for application in safety research</u> 3. <u>Questionnaires and data management techniques.</u> 4. <u>Information analysis</u>
<u>Aviation Safety Management Information</u>	<ol style="list-style-type: none"> 1. <u>Development of aviation safety management information system (Library/database)</u> 2. <u>Safety reporting and presentation of safety information</u>

<u>Emergency Response Planning</u>	<ol style="list-style-type: none"> 1. <u>The concept of emergency response planning</u> 2. <u>Emergency response principles and practices</u> 3. <u>The role, functions and responsibilities of the different role players in emergency response</u> 4. <u>The role and functions of the different centers in emergency response</u> 5. <u>Design and management of emergency response exercises</u> 6. <u>Development and implementation of emergency response procedures</u>
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(2) The training programme may include the learning content reflected below:

Skill	Learning content
<u>Strategic Safety Management</u>	<ol style="list-style-type: none"> 1. <u>The science and philosophy of strategic management.</u> 2. <u>The factors affecting strategic management</u> 3. <u>Setting of strategic safety objectives and performance targets</u> 4. <u>Development of safety cases</u> 5. <u>Aviation safety planning in support of the corporate business plan</u> 6. <u>Monthly and annual aviation safety reporting</u>
<u>Auditing</u>	<ol style="list-style-type: none"> 1. <u>Role of safety manager in auditing (mainly contractors)</u> 2. <u>Developing, producing and monitoring an audit schedule</u> 3. <u>Audit planning and preparation</u> 4. <u>Conducting audits</u> 5. <u>Implementation of effective corrective measures including monitoring of its success</u>
<u>Communication</u>	<ol style="list-style-type: none"> 1. <u>Written: Report writing and presentation</u> 2. <u>Verbal: Motivation, negotiation and logical presentation</u>
<u>Aviation safety administration</u>	<ol style="list-style-type: none"> 1. <u>Safety administration system (document and system management)</u>
<u>Financial management</u>	<ol style="list-style-type: none"> 2. <u>Fundamentals of financial management</u> 3. <u>Formulation of budget</u> 4. <u>Budget monitoring</u> 5. <u>Cost benefits analysis of safety implementation</u>

<u>Project management</u>	<ol style="list-style-type: none"> 1. <u>Basic project management skills</u> 2. <u>Organization and coordination of resources.</u>
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3.6 Organizations which may provide safety management system training

The Director recognises the following international organisations as organisations which may conduct SMS training outside of the auspices of Part 141 approval:

- (a) International Civil Aviation Organisation (ICAO);
- (b) International Air Transport Association (IATA);
- (c) Civil Air Navigation Services Organisation (CANSO);
- (d) Airports Council International (ACI).

4. Qualifications of safety manager

- (1) The qualifications of the safety manager include, the following skills, qualifications and experience:
 - (a) full-time experience in aviation safety in the capacity of an aviation safety investigator, safety/quality manager or safety risk manager;
 - (b) sound knowledge of the organization's operations, procedures and activities;
 - (c) broad aviation technical knowledge;
 - (d) an extensive knowledge of safety management systems (SMS) and have completed appropriate SMS training;
 - (e) an understanding of risk management principles and techniques to support the SMS;
 - (f) experience implementing and/or managing an SMS;
 - (g) experience and qualifications in aviation accident/incident investigation and human factors;
 - (h) experience and qualifications in conducting safety/quality audits and inspections;
 - (i) sound knowledge of aviation regulatory frameworks, including ICAO Standards and Recommended Practices (SARPS) and relevant civil aviation regulations;
 - (j) the ability to communicate at all levels both inside and outside the company;
 - (k) the ability to be firm in conviction, promote a "just and fair culture" and yet advance an open and non-punitive atmosphere for reporting;
 - (l) the ability and confidence to communicate directly to the accountable executive as his advisor and confidante;

- (m) well-developed communication skills and demonstrated interpersonal skills of a high order, with the ability to liaise with a variety of individuals and organizational representatives, including those from differing cultural backgrounds;
- (n) Computer literacy and superior analytical skills.

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 the area operational management and/or safety manager.
- (2) Reporting procedures shall include management reporting and reporting to the Director.
- (3) The entity shall report any hazard with intolerable/high/unacceptable risk identified through its SMS to the Director 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) The Pilot In Command or flight crew member or entity shall report the following safety information to the Director:
 - (a) Aviation accidents as soon as possible but at least within 24 hours since the time of the accident in a manner prescribed by the Director;
 - (b) Serious incidents as soon as possible but at least within 48 hours since the time of the incident/serious incident in a manner prescribed by the Director;
 - (c) Incidents as soon as possible but at least within 72 hours since the time of the incident in a manner prescribed by the Director and other safety related occurrences as per schedule agreed to with the Director;
 - (d) The hazards identified by the entities on an annual basis to include all hazards in the intolerable region and tolerable region to list not exceeding 20; and
 - (e) the mitigation strategies implemented to address the risk.”.