REPUBLIC OF NAMIBIA

CIVIL AVIATION

DOCUMENT NAM-CATS-43

(GENERAL MAINTENANCE RULES)

NAMIBIAN CIVIL AVIATION TECHNICAL

STANDARDS RELATING TO GENERAL MAINTENANCE RULES

1. GENERAL

Section 22A of the Aviation Act, 1962 (as amended by section 5 of the Aviation Amendment Act, 1998) empowers the Director: Civil Aviation to issue technical standards for civil aviation on the matters which are prescribed by regulation.

The Director: Civil Aviation has pursuant to the empowerment mentioned above, on (date) issued technical standards relating to general maintenance rules to be known as Document NAM-CATS-43.

2. PURPOSE

Document NAM-CATS-43 contains the standards, rules, requirements, methods, specifications, characteristics and procedures which are applicable in respect of general maintenance rules requirements.

Each reference to a technical standard in this document, is a reference to the corresponding regulation in the Namibian Civil Aviation Regulations, 2001 as amended, for example, technical standard 43.02.18 refers to regulation 18 of Subpart 2 of Part 43 of the Regulations.

The abbreviation ”CAR” is used throughout this document when referring to any regulation. The abbreviation ”TS” refers to any technical standard.

3. SCHEDULES AND NOTES

Guidelines and recommendations in support of any particular technical standard, are contained in schedules to, and/or notes inserted throughout the technical standards.

NAM-CATS 43

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1. Format

(1) The approved format of the logbooks prescribed in NAMCAR 43.01.3 is that format published in AIC number 60.12 or as otherwise as specified by the Director.

(2) The approved logbook makes provision for the recording of –

(a) airframe, engine and propeller particulars;
(b) major defects and damage;
(c) compass check swings;
(d) Class 1 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; and
(j) scheduled and non-scheduled maintenance and defect rectification on airframe, engines, propellers and accessories and any relevant matter.

(3) The approved logbook contains instructions with regard to the opening of the logbook and the recording of entries therein.

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 substitute logbook(s) shall be inspected by an Airworthiness Inspector of the Directorate who will date and insert the Director's authorisation to open the substitute logbook.

(5) In the event of all relevant documentation having been lost, all documents required for the issue of a Certificate of Airworthiness or Authority to Fly must be prepared in accordance with this technical standard, and the aircraft and its documents shall be re-inspected by an Airworthiness Inspector of the Directorate.

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 or learner's certificate, with an appropriate rating issued in terms of Part 61 or Part 62 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:

(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 means of stop drilling cracks and fitting small 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 owners 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 check is carried out in accordance with TS 43.02.9 for subparagraphs (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;
(iii) supplying maintenance publications, where required; and

(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 inthe column intended for the signature of the holder of an aircraftmaintenance engineer licence or aircraft maintenance organisation approval.

43.02.3 CARRYING OUT OF MAINTENANCE

1. Maintenance control manual

The Maintenance Control Manual (MCM) prescribed by NAMCAR 43.02.3(f), which may be issued in separate parts, shall contain the following information:

(1) Description of the procedures required to ensure that –

(a) each aircraft, covered by the MCM, is maintained in an airworthy condition;

(b) the operational and emergency equipment, necessary for an intended flight, is serviceable;

(c) the Certificate of Airworthiness or the Authority to Fly, as the case may be, and the Certificate of Release to Service remains valid for each aircraft covered by the MCM.

(d) the manual complies with all applicable regulations and requirements and with the terms and conditions of the applicable Air Operator Certificate.

(e) A statement that the manual contains maintenance and operational instructions that are to be complied with by the relevant personnel in the performance of their duties.

(f) A list and brief description of the various Maintenance Control Manual parts, their contents, applicability and use.

(g) Explanations and definitions of terms and words used in the manual.

(h) System of Amendment and Revision

(i) A Maintenance Control Manual shall describe who is responsible for the issuance and insertion of amendments and revisions.
(ii) A record of amendments and revisions with insertion dates and effective dates is required.
(iii) A statement that hand-written amendments and revisions are not permitted except in situations requiring immediate amendment or revision in the interest of safety.
(iv) A description of the system for the annotation of pages and their effective dates.
(ev) A list of effective pages and their effective dates.
(vi) Annotation of changes (on text pages and as practicable, on charts and diagrams).
(vi) A system for recording temporary revisions.
(viii) A description of the distribution system for the manuals, amendments and revisions.
(viii) A statement of who is responsible for notifying the authority of proposed changes and working with the authority on changes requiring authority approval.

(b) Corporate commitment by the AOC
(c) General information:

(i) Brief description of organization
(ii) Relationship with other organizations
(iii) Fleet composition - Type of operation
(iv) Line station locations

(d) the administrative arrangements between the operator and the approved maintenance organisation;

(e) 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;

(f) 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;

(g) a description of the methods used for the completion and retention of the maintenance records;

(h) a description of the procedure for monitoring, assessing and reporting maintenance required by the operator of an aircraft in terms of Subpart 9 of Part 121, 127 & 135.

(i) a description of the procedures for complying with the service information reporting requirements to the aircraft manufacturer and to the Director;

(j) 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;

(k) 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;

(l) 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;

(m) 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;

(n) 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;

(o) a description of procedures for controlling recurring defects, the reporting system to be established, and system to effect corrective action;

(p) 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;

(q) a description of the procedure for advising the Director of significant in-service occurrences;

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

2. Maintenance programme

The maintenance programme including the maintenance schedule, for each aircraft referred to in section 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, paragraphs (a) and (b) above; and
(d) when applicable, condition monitoring and reliability programme descriptions for aircraft systems and powerplants.

(e) Repetitive maintenance tasks that are specified in mandatory intervals as a condition of approval of the type design shall be identified as such.

Maintenance task and intervals that have been specified as mandatory in approval of the type design shall be identified as such. The maintenance programme shall be based on the NAMCAR requirements and the maintenance programme information made available by the State of Design or by the organization responsible for the type design, and any additional applicable experience.

3. Condition monitoring and reliability programme descriptions for aircraft systems and powerplant

(1) The Director may require that the air operator develop a reliability programme in conjunction with the maintenance programme in order to ensure the continuing airworthiness of the aircraft. Specifically, the programme may be required in the following cases:

a) the aircraft maintenance programme is based upon MSG-3 logic; or
b) the aircraft maintenance programme includes condition monitored components; or
c) the aircraft maintenance programme does not include overhaul time periods for all significant system components; or
d) when specified by the Manufacturer's MPD or MRB report.

Note 1. — for the purpose of this paragraph (1)(c) "significant system" is a system the failure of which could cause a hazard to the safe operation of the aircraft.

Note 2. — Notwithstanding paragraph (1) an operator that is not required to develop a reliability programme however may develop its own reliability monitoring programme when it may be deemedbeneficial from a maintenance point of view.
Note 3. —Two primary maintenance procedures that have currently been utilized for the purpose of a maintenance programme: MSG-2 for maintenance processes, i.e. hard time (HT), on condition (OC) and condition monitoring (CM); MSG-3 for maintenance tasks, i.e. lubrication and servicing, operational and visual check, inspection and function and functional check, restoration and discard.

(a) The purpose of a reliability programme is to ensure that the aircraft maintenance programme tasks are effective and their recurrence at regular intervals is adequate. The reliability programme therefore may give rise to the optimization of a maintenance task interval, as well as the addition or deletion of a maintenance
task. In this respect, the reliability programme provides an appropriate means of monitoring the effectiveness of the maintenance programme.

(b) Reliability programmes are designed to supplement the operator's overall programme for maintaining aircraft in a continuous state of airworthiness. There are a number of maintenance reliability programmes now in operation that use new and improved maintenance management techniques. Although the design and methods of application vary to some degree, the basic goals are the same —

(i) by recognizing access and acting upon meaningful symptoms of deterioration before malfunction or failure in order to establish and monitor the MCM requirements.

(c) Performance standards (e.g. alert value) are established by actuarial study of service experience using statistical methods coupled with application of technical judgment. These standards are used to identify trends or patterns of malfunction or failures experienced during programme operation. Even though reliability programmes vary, they should provide means for measurement, evaluation, and improvement predictions.

Refer to part 6 for contents of the programme.

43.02.5 OVERHAUL, REPAIR AND SUBSTITUTION OF MAJOR COMPONENTS

1. 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 regulation 43.02.16.

(d) All documents pertaining to the repairs of an aircraft that sustained damage to the primary structure, engine(s) or propeller(s), shall be inspected by an Airworthiness Inspector of the Directorate or a person authorised by the Director after the necessary repairs have been carried out.

(e) Copies of the certificates relating to maintenance (CRMs) 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.

2. Overhauls: General

(1) Any overhaul must be carried out in accordance with the manufacturer's current overhaul manuals. Mandatory Airworthiness Directives, Service Bulletins, Service Letters and Service Instructions must be embodied as directed.

(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 1 products may not be fitted to an aircraft unless an export certificate of airworthiness from the State of manufacture, remanufacture or overhaul, or other data that is acceptable to the Director, has been submitted to the Director.

(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.

(7) 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.

(8) The record of the overhaul must include a statement that the mountings have been inspected and, if damage is found, the repairs certified.

3. 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.

4. Engine overhauls

(1) The engine overhauls specified in Appendix 1 are mandatory for all aircraft. All components specified in the engine type certificate must either be overhauled concurrently with the engine, unless the manufacturer has directed otherwise, or be substitutes by an identical, serviceable item. The engine must then be tested as a complete unit in accordance with the manufacturer's instructions.

(2) 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.

(3) The engine and its Class II products, notably the ignition system, the fuel system, and (when fitted) the turbo charging system must be overhauled according the requirements of their manufacturers, unless otherwise directed by the Director.

(4) The engine together with the Class II products specified in subsection (3) must 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.

(5) 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) when an engine installed in an aircraft has exceeded the manufacturer's recommended time between overhauls;
(e) where no historical records for the engine can be found.

(6) 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.

(7) 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 ……(insert a reference to the applicable MCM, manufacturer's maintenance manual, or specific exemption granted by the Director on which authority the extension is certified), have satisfied myself that the maintenance records, performance, condition and record history of …… (insert the name of the product or component concerned, giving a description and quoting part and serial number) since new or last overhaul is such that it can be operated with safety

for a further ……. hours of flight time and I hereby authorise such extension."

Signature:

Licence No.:

Date:

5. Propeller overhauls

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

6. 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.

(3) 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 paragraph (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

Whenever an inspection or maintenance is carried out on communication, navigation and surveillance equipment in an aircraft, required for use under IFR, 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;
(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 ± 1° 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 he 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 NAMCAR 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 NAMCAR 43.02.3 in respect of the manner in which maintenance must be carried out.

2. Form

(1) The mass and balance data as prescribed in NAMCAR 43.02.7 shall be recorded on Form FSS-AIR-FORM097/11 as amended.

(2) 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;
(i) (A specimen mass and balance report is given in FAA Advisory Circular AC 43.13-1 B.)
(e) reference number of applicable publications used; and
(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.

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 subsection (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.

(3) 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 (43.02.6)

This Technical Standard comprises the following Sections and Parts:

Section A: General

1. General instructions
2. Inspections
3. Associated documents

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

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

Section D: Maintenance Schedule for Aeroplanes with an MCM in excess of 5 700 kg and Maintenance Schedule for Helicopters with an MCM in excess of 3 175 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 Schedule for Gliders, including Power-assisted and Touring Gliders

SECTION A: GENERAL

1. General instructions

(1) Unless the Director has granted written 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 schedule and by the manufacturer has been carried out when due and has been certified by an appropriately rated licence holder, persons authorised in terms of Part 24 or 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 schedules 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-hours-flown or cycles-based.

(3) The maintenance requirements contained in an aircraft's maintenance schedule 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 schedule 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) Nothing in a maintenance schedule is to be construed as relieving the pilot-in-command of an aircraft from his or her responsibility regarding flight preparation as prescribed in NAMCAR 91.02.7.

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.

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) Maintenance required to be carried out in accordance with the provisions of a maintenance schedule 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.

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.

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.

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) Maintenance away from base may only be performed at an approved AMO or at a facility approved by the Director where equipment, test facilities and spares for the type of maintenance to be undertaken are available. All the necessary manuals and catalogues for the particular aircraft shall be available. Prior to the commencement of such maintenance, 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.

(7) 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.

[*Note: When an aircraft maintenance organisation holds only one set of tools or manuals, and these tools or manuals are sent away to the facility where the above referred-to away-from-base maintenance is to be performed, the relevant privileges granted to the organisation may not be exercised at its approved main base of operation until such time as the tools and necessary manuals have been returned.*]

(8) Failure to comply with any applicable mandatory requirement or part of a maintenance schedule 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 NAMCAR.

(9) 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

Inspections consist of the following:

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

(2) Recommended inspections
The inspections referred to in subsection (1) (a) are recommended. However, when the contents of the recommended inspection indicate that the airworthiness of the aircraft may be affected, they must be complied with in respect of aircraft utilised in commercial air transport operations, and in the case of other aircraft whenever so directed by the Director.

(1) Mandatory Inspections

(a) The inspections referred to in paragraphs (1) (b) and (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 NAMCAR 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.

(b) Mandatory Periodic Inspections (MPI)

(i) 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.)

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

(a) 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 licence holder for the appropriate period as prescribed in the NAMCAR.

(b) All relevant logbooks must be on hand during an MPI.

(c) Before commencing an inspection, the relevant areas must be exposed to assess the condition of the areas under inspection.

(d) Serviceability of the aircraft must be determined by a thorough inspection in accordance with the manufacturer's recommendations and standard inspection practices and procedures.

(e) 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.

(f) An aircraft inspection report FSS-AIR-FORM 098/11 "Aeroplanes", FSS-AIR-FORM 099/11 'Helicopters', "Gliders" or 'Manned Balloons' must be completed and together with a copy of the certificate of release to service of an aircraft forwarded to the Director within 48 hours after completion of the MPI.

(iii) 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.

(c) Progressive inspections

(i) 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 be accompany the request.

(ii) 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 a 12 months period, the aircraft shall undergo the remainder of its progressive inspection programme before it is being released to service. (This means that the aircraft shall complete its progressive inspection programme always within a 12-months period, if not in a lesser period.)

(iii) An aircraft inspection report form FSS-AIR-FORM O98/11 “Aeroplanes” or FSS-AIR-FORM 099/11 “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 to the Director.

(iv) The provisions of paragraph (b) shall apply with the necessary changes.

(2) Block inspections

(a) Aeroplanes with a maximum certificated mass in excess of 5 700 kg, and helicopters with a maximum certificated mass in excess of 3 700 kg, may be inspected and maintained in accordance with an approved maintenance schedule divided in blocks.

(b) Where the maintenance schedule 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 schedule 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.

(3) Other inspections

(a) Duplicate inspection

A duplicate inspection of all 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 NAMCAR 43.04.1 prior to further flight. See also NAMCAR 43.04.7 "Duplicate Inspection of Controls".

(b) Non-scheduled maintenance inspections

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

(a) hard/overweight landings;
(b) operations outside the normal flight envelope e.g. - exceeding placarded speed for flaps or landing gear, exceeding aircraft design speeds and loads, etc.;
(c) severe air turbulence or severe manoeuvres;
(d) lightning strikes;
(e) foreign-object damage;
(f) unconfined engine failures;
(g) towing - involving high drag/side loads due to ground handling; or
(h) 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:

(a) All propeller parts as detailed in the overhaul/repair manuals and IPCs.

(b) All engine gaskets, seals, induction and rocker drain hoses, or any other hose that has become brittle, and all locking devices.

(c) All crankshaft bearing or bearing inserts (main and connecting rods), and reduction gear shaft bearing or bearing inserts, where applicable.

(d) All connecting rod bolts and nuts.

(e) All counterweight retention parts (for counterweight-equipped engines).

(f) All piston rings.

(g) All shock absorbing rubbers (magneto and alternator drives).

(h) 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.

(i) All engine mounting rubbers and the engine mounting(s) and attachments shall be x-ray, magnaflux or dye-penetrant inspected and replaced as required.

(j) 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.

(4) Fuel-flow checks

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

(a) At each MI 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

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

(a) 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

(b) additional requirements issued by the Director, including those contained in Aeronautical Information Circulars 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 Modification) or their successor publications.

(2) 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.

(3) 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.

(4) 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.

(5)(a) 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 classified as mandatory, are complied with as specified in each directive before the aircraft is released to service.

(b) “Mandatory” in this context means:

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

(ii) the Director instructs that a SB, SL, SI or other service information, issued by a manufacturer shall be complied with;

(iii) the Director instructs that a SB, SL, SI or other service information, relating to the safety of the aircraft, 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 of flying training (other than the training of its registered owner).

(c) 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 which case he or she shall comply with the provisions of paragraph (d).

(d) Whenever an owner, referred to in subregulation (c), 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".

(6) 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.

(7) 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.

(8) 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.

(9) 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.

(10) 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.

(11) 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 SCHEDULE FOR AEROPLANES WITH AN MCM OF 5 700 KG OR LESS (MINIMUM REQUIREMENTS)

Provided the Maintenance Schedule is drawn up in accordance with this Technical Standard, it serves as the approved aircraft maintenance schedule 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. General:

Aircraft type	Registration V5	S/N
Engine type (give full designation)		
Engine serial number(s)	No. 1	No.2
Propeller/s type (as applicable)	No. 1	No.2
Propeller/s serial number(s)	No. 1	No. 2

2. Hours of operation

Airframe Total time Hrs Landings If applicable

Cycles if applicable

Engine(s) since new or last overhaul and date of last overhaul

No.1 Hrs Cycles No.2 Hrs Cycles

No. 1 Date of O/H No. 2 Date of O/H

Propeller(s) since new or last overhaul/mid-life inspection and date of last overhaul

No.1 Hrs Cycles No.2 Hrs Cycles

No. 1 Date of O/H No. 2 Date of O/H

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 No.:	Currency date

6. Record of avionics equipment installed (name, type and serial nos.):

VHF	ADF	RADAR
HF	DME	GPS
TXPDR	STORMSCOPE	OTHER

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 schedule 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, Fiberglas or fabric skin for deterioration, distortion, cracks, corrosion and other evidence of failure and defective or insecure attachments.

3. Inspect the interior of the fuselage hull, empennage, centre section, wings, control surfaces for deterioration, distortion, cracks, corrosion and other evidence of failure and defective or insecure attachments.

4. Inspect fabric-covered wings interior cross bracing brackets, bracing rods and the wing rib lacing cords for proper tightness or failure and correct as necessary.

5. Inspect fuel tanks for condition, leaks and corrosion on the tanks and in the tank bays. 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.

9. Seats for condition and apparent defects, seat rails for condition, wear, 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.

13. Inspect compass for discolouration and bubbles, check for freedom of rotation and ensure that compass has been swung in accordance with the requirements and periods specified in Technical Standard 43.02.18.

14. Check altimeters and airspeed indicators for accuracy. Carry out a pitot static 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

20. Check flap travel and record:

Up	intermediate	down

(as applicable)

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

Rudder left	right
Rudder trim tab: L	R
Elevator up	down
Elevator trim tab: Up	down

(as applicable)

22. Carry out fuel flow checks:

Left:	Auxiliary Left
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):

Left Hand Engine	/80	/80	/80	/80	/80	/80	/80	/80
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:

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 flexible hoses shall be renewed every eight years. Record part numbers of any hoses replaced 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 NAMCAR 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.

   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.

4. 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.

   (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, 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 Namibian Civil Aviation Regulations as amended, 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 SCHEDULE FOR HELICOPTERS WITH AN MCM OF 3 175 KG OR LESS (MINIMUM REQUIREMENTS)

Provided the Maintenance Schedule has been drawn up in accordance with this Technical Standard it serves as the approved Aircraft Maintenance Schedule 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.

SAMPLE LAYOUT OF CHECK-LIST, CONTAINING MINIMUM REQUIREMENTS

1. General:

Helicopter type Registration V5 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 Hrs. Landings If applicable

Cycles if applicable

Engine(s) since new or last overhaul and date of last overhaul

No.1 Hrs. Cycles No.2 Hrs. Cycles

No. 1 Date of O/H No.2 Date of O/H

Rotors since new or last overhaul and date of last overhaul

No.1 Hrs. Cycles

No.1 Date of O/H

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:

6. Record of avionics equipment installed (name, type and serial nos.):

VHF	ADF	RADAR
HF	DME	GPS
TXPDR	STORMSCOPE	OTHER

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 schedule for a particular make and type of aircraft.]

1. Before the inspection, remove or open all necessary inspection panels, access doors, fairings and cowlings and thoroughly clean the aircraft, engine, gearbox and rotors.

2. Inspect the metal, Fiberglas or fabric skin for deterioration, distortion, cracks, corrosion and other evidence of failure and defective or insecure attachments.

3. Inspect the interior of the fuselage hull, empennage, centre section, rotor blades for deterioration, distortion, cracks, corrosion and other evidence of failure and defective or insecure attachments.

4. Inspect fuel tanks for condition, leaks and corrosion on the tanks and 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.

7. Inspect area beneath floor including, lines, hoses, wires, control cables and pulleys for condition, cleanliness, security, routing and proper functioning.

8. Seats for condition and apparent defects, seat rails for condition, 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.

12. Inspect compass for discolouration and bubbles, check for freedom of rotation and ensure that compass has been swung in accordance with the requirements and periods specified in Technical Standards 43.02.18.

13. Check altimeters and airspeed indicators for accuracy. Carry out a 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.

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

17. Inspect main, nose landing gear or skids 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 and 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.

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:

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 flexible hoses shall be renewed every eight years. Record part numbers of any hoses replaced in the appropriate logbook(s).

2. Ensure that the helicopter empty mass has been established in accordance with the requirements of NAMCAR 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. A helicopter may not be released for service unless the following documentation has been checked for availability, applicability and being up to date:

(a) Certificate of registration No.

(b) Certificate of airworthiness No.
(c.) Currency date
(d) Radio Station licence
(e) Expiry date
(f) Certificate of release to service.
(g) Approved flight manual P/No.

(h) Revision date/number

(i) Approved mass and balance data and equipment list.

(j) Approved flight folio.

(k) Approved minimum equipment list, if applicable.

(l) Inspection reminder as prescribed in ANNEX A.

(m) Record next inspection due: hrs. and date.

4. Airframe and engine(s) logbooks:

(a) Record all Airworthiness Directives complied with during this inspection.

(b) Record all recurring Airworthiness Directives complied with during this inspection.

(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, 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 SCHEDULE FOR AEROPLANES WITH AN MCM IN EXCESS OF 5 700 KG, AND HELICOPTERS WITH AN MCM IN EXCESS OF 3 175 KG (MINIMUM REQUIREMENTS)

APPROVED MAINTENANCE SCHEDULE NO.:

FOR AIRCRAFT V5 – SERIAL NO.:

MAKE: MODEL:

This maintenance schedule 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 schedule contains the minimum requirements in respect of the maintenance and inspections prescribed aeroplanes with an MCM of 5 700 kg or less and for helicopters with an MCM of 3 275 kg respectively, utilised in commercial air transport operations.

2. Approval

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

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

(3) This maintenance schedule is approved in terms of the powers granted to me by Part 183 of the Namibian Civil Aviation Regulations 2001, as amended and shall become effective on …… (date).

Signed: Date:

DIRECTOR OF CIVIL AVIATION

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REVISION STATUS

REVISION NUMBER	INCORPORATED BY	DATE

3. Abbreviations

AD–Airworthiness Directive

AIC–Aeronautical Information Circular

AME–Aircraft Maintenance Engineer

AMO–Aircraft Maintenance Organisation

AMS–Approved Maintenance Schedule

BCAR–British Civil Aviation Requirements

NAMCAR– Namibian Civil Aviation Regulations

CATS–Civil Aviation Technical Standards

CD–Compact Disc

CDL–Configuration Deviation List

C of A–Certificate of Airworthiness

C of R–Certificate of Registration

CRS–Certificate of Release to Service

CPCP–Corrosion Prevention Control Programme

CRM–Certificate Relating to Maintenance

DDM–Dispatch Deviation Manual

DGAC–Direction Generale de l'Avaition Civile

Director–Director for Civil Aviation

FAA–Federal Aviation Administration

FAR–Federal Aviation Regulations

HRS–Hour

IPC–Illustrated Parts Catalogue

JAA–Joint Aviation Authorities

JAR–Joint Aviation Requirements

MCM–Maximum Certificated 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

DCA –Namibian Directorate of Civil Aviation.

SB–Service Bulletin

SI–Service Instruction

SL–Service Letter

S/N–Serial Number

SRM–Structural Repair Manual

TBO–Time Between Overhaul

TS-Technical Standards

4. Definitions

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

"Aircraft" means an aircraft as defined in the 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 Schedule" 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.

"Large helicopter" means a helicopter with an MCM in excess of 3 175 kg.

"Maintenance" means all work carried out in accordance with manufacturers' recommendations and approved maintenance schedules 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.

5. General instructions

(1) The onus for ensuring that an aircraft is kept airworthy rests on the registered owner/operator of the aircraft. This maintenance schedule 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 schedule 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/DDL 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 affect 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 schedule relates, will drawn up a maintenance planning document (MPD) 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, 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 unlikely event of the aircraft is not utilised in commercial air transport operations or for the provision of flight training, the provision of subparagraph 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 schedule, 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 schedule shall be considered to be complete until all items found unsatisfactory have been effectively rectified.

(9) Nothing in this maintenance schedule 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.

6. 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 schedule.

(2) Where Part 2 of this maintenance schedule shows only the items to be inspected at each check, without detailing what they are to be inspected for, the user of the maintenance schedule shall compile check sheets from approved data which shall indicate in detail the inspection requirements.

(3) Amendments to this maintenance schedule must be submitted for approval by the aircraft owner or operator of the aircraft to which the schedule refers. Therefore, maintenance organisations are not entitled to request any changes to this maintenance schedule 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 schedule 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.

7. Overhaul or substitution

(1) The aircraft and its components or installed equipment shall be overhauled or substituted in accordance with current instructions prescribed in paragraph 4(6) of Part 1 of this schedule 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 Schedule.

(3) If the owner of the aircraft, to which this maintenance schedule refers, wishes to extend any TBO specified in Part 3 of this Schedule, he or she shall apply in writing for the temporary amendment of this Schedule. Such application must be supported by

adequate information substantiating the temporary amendment applied for. The application must follow the procedure as prescribed in regulation 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 ADs, manufacturer's mandatory requirements, such as SBs, SIs and SLs, and applicable structural integrity inspections, corrosion prevention control programme (CPCP), or any other requirement called out in a maintenance planning document (MPD). See also subparagraph 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 Schedule shall be made to the system without the prior approval of the Director.

(7) 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 Schedule, shall be as follows:

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

8. Mandatory modification and special inspections

(1) Unless the Director has approved an amendment to this Schedule, 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 subparagraphs 3(5)(c) and (d) of Section A of Technical Standard 43.02.8.

(2) Part 4 of this Maintenance Schedule 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 paragraph (2) above shall apply with the necessary changes.

9. Certificates of release to service

(1) A Certificate of Release to Service, as prescribed in Part 5 of this Schedule and issued in accordance with the requirements of the Civil Aviation Regulations 2001, as

amended, shall be valid for the interval between any successive checks or on completion of an inspection cycle required by this Maintenance Schedule

(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 NAMCAR 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 Schedule, 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.

(5) An aircraft may not be released to service with any unsatisfactory items or deferred defects without approval from the Director.

10. Avionics, instrumentation and electrical

(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 NAMCAR 43.02.2(3) the routine maintenance, scheduled inspections, structural integrity inspections, overhaul, modification, major repairs and structural repairs on aeroplanes with a maximum certificated mass in excess of 5 700 kg or on helicopters with a maximum certificated mass in excess of 3 175 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. Thus the holder of an AME category A or C licence may not exercise this privilege in respect of the aircraft to which this schedule relates.

11. Amendments

(1) This maintenance schedule specifies the minimum maintenance considered necessary to maintain the aircraft to which it refers in an airworthy condition. No amendment to this maintenance schedule may be made without the prior written approval of the Director.

(2) Subparagraph (1) is not to be construed as prohibiting any additional maintenance, not specifically mentioned in this schedule, 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 schedule is made accordingly. The Director may wave the amendment requirement.

(3) Amendments to this Maintenance Schedule shall become effective on the date of approval by the Director or otherwise as indicated in subparagraph 1(5) of Part 1 of this Schedule.

(4) The user of this Maintenance Schedule shall, prior to use, ensure that it has been amended to date.

12. Aircraft inspection report

An aircraft inspection report form FSS-AIR-FORM 098/11 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.

13. 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 Civil Aviation Regulations 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.

(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.

14. 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.

15. Associated documents

(1) During the maintenance of the aircraft to which this schedule 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 NAM-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).

[*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) Currency date
(d) Radio Station Licence No.
(e) Currency date
(f) Certificate of Release to Service
(g) Approved Flight Manual
(h) Mass and Balance and Equipment List data
(i) Flight Folio
(j) MEL
(k) Aircraft logbook/s

(l) Reduced Vertical Separation Minimum (RSVM) certificate (if applicable)
(m) Noise certificate (if applicable)
(n) Engine emission certificate (if applicable)
(o) Fuel venting certificate (if applicable)
(p) Approved Maintenance Schedule

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

   (*Specify*)

2. Notwithstanding the requirements contained in paragraph 1, it shall be permissible under this schedule 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 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 number of hours extended is 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 paragraph 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. 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.

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: AND SUBSTITUTION OF CLASS I AND II PRODUCTS

1. Listed in Table 1 are extension intervals that the Director allows to be granted to the Time Between Overhauls in respect of the aircraft and installed equipment. These extension periods may NOT be granted, if the manufacturer has stipulated an escalation programme approved by the Director. Escalation programmes do not qualify for these extensions.

2. An appropriately certified person nominated by the Accountable Manager of an approved aircraft maintenance organisation may extend any TBO listed in Table 1 as follows:

Table 1

Prescribed TBOs		**Maximum extension period permitted, unless the Director approves otherwise**
(i)	Up to 3 000 hours	100 hours
(ii)	3 001 to 6 000 hours	200 hours
(iii)	6 001 to 9 000 hours	300 hours
(iv)	9 001 to 12 000 hours	400 hours

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 paragraph 3 below in the appropriate logbook or other appropriate approved record prior to the component concerned is operated for the extended period.

3. On each occasion that an extension is granted in terms of paragraph 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. 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 NAMCAR 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 schedule 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) the Director instructs that a SB, SL, SI or other service information, issued by a manufacturer shall be complied with;

   (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;

   (e) 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".

4. Requirements quoted in ADs are periodically revised. Each user of this schedule 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 have 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 paragraph 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 and helicopters with an MCM in excess of 3 175 kg, as prescribed in Annexure B 2, and amended to reflect the details of the issuing AMO.

PART 6: RELIABILITY PROGRAMME

(1) The Director may require that the air operator develop a reliability programme in conjunction with the maintenance programme in order to ensure the continuing airworthiness of the aircraft. Specifically, the programme may be required in the following cases:

a) the aircraft maintenance programme is based upon MSG-3 logic; or

b) the aircraft maintenance programme includes condition monitored components; or
c) the aircraft maintenance programme does not include overhaul time periods for all significant system components; or
d) when specified by the Manufacturer's MPD or MRB report.

Note 1. — for the purpose of this paragraph (1)(c) "significant system" is a system the failure of which could cause a hazard to the safe operation of the aircraft.

Note 2. — Notwithstanding paragraph (1) an operator that is not required to develop a reliability programme however may develop its own reliability monitoring programme when it may be deemedbeneficial from a maintenance point of view.
Note 3. —Two primary maintenance procedures that have currently been utilized for the purpose of a maintenance programme: MSG-2 for maintenance processes, i.e. hard time (HT), on condition (OC) and condition monitoring (CM); MSG-3 for maintenance tasks, i.e. lubrication and servicing, operational and visual check, inspection and function and functional check, restoration and discard.

(c) The purpose of a reliability programme is to ensure that the aircraft maintenance programme tasks are effective and their recurrence at regular intervals is adequate. The reliability programme therefore may give rise to the optimization of a maintenance task interval, as well as the addition or deletion of a maintenance task. In this respect, the reliability programme provides an appropriate means of monitoring the effectiveness of the maintenance programme.

(d) Reliability programmes are designed to supplement the operator's overall programme for maintaining aircraft in a continuous state of airworthiness. There are a number of maintenance reliability programmes now in operation that use new and improved maintenance management techniques. Although the design and methods of application vary to some degree, the basic goals are the same —

(ii) by recognizing access and acting upon meaningful symptoms of deterioration before malfunction or failure in order to establish and monitor the MCM requirements.

(c) Performance standards (e.g. alert value) are established by actuarial study of service experience using statistical methods coupled with application of technical judgment. These standards are used to identify trends or patterns of malfunction or failures experienced during programme operation. Even though reliability programmes vary, they should provide means for measurement, evaluation, and improvement predictions.

1. The Reliability Programme prescribed by NAMCAR 43.02.3(2)(d), which may be issued in separate parts, shall contain the following information:

2. EACH PROGRAMME MUST CONTAIN THE FOLLOWING BASIC ELEMENTS:

a. Programme application

b. Organization structure.

c. Data collection system.

d. Methods of data analysis and application to maintenance controls.

e. Procedures for establishing and revision of performance standards.

f. Definitions of significant terms.

g. Programme displays and status of corrective action programmes.

h. Procedures for programme revision.

i. Procedures for maintenance control changes.

3. A PROGRAMME WHICH IS VERY GENERAL

may lack the details necessary to satisfy the above requirements. The following information should be applied to the specific needs of a simple or complex programme:

a. Programme Application.

(1) The components, system, or complete aircraft controlled by the programme must be clearly defined. Individual systems and / or components must be identified by ATA Specification 100. In the case of components, a list of all components

controlled by the programme must be included as an appendix to the programme document.

(2) The portion of the maintenance programme; e.g., overhaul and / or inspection and check periods to be controlled by the programme must also be clearly defined.

b. Organizational Structure.

(1) Organizational chart which depicts the relationship of elements responsible for the administration of the programme must be included.

(2) Lines of authority and responsibility must be clearly delineated.

(3) Authority delegated to each organizational element for the enforcement of policy and to assure corrective action followup must be adequately described.

c. Data Collection System.

(1) A description of the data collection system relating to the aircraft and / or system / component to be controlled must be fully described. The following must be adequately covered:

(a) Flow of information.

(b) Identification of sources of information.

(c) Description of steps of data development from source to analysis.

(d) Organizational responsibilities for each step of data development.

(2) Data Collected.

(a) Must be accurate and factual to support a high degree of confidence in any derived conclusion.

(b) Must be obtained from units functioning under operational conditions.

(c) Must be directly related to the established levels of performance. This particular point cannot be overemphasized since it represents programme accomplishment.

(3) Typical source of information are: Unscheduled removals, confirmed failures, pilot reports, sampling inspections, shop findings, functional checks, bench checks or other sources the operator may consider appropriate.

(a) All of the above may not necessarily be covered in each and every programme.

(b) However, the availability of this additional information will provide a span of invaluable operating history to the operator for determining success or failure in meeting programme goals.

(4) Samples of data to be collected must be included in the programme document: e.g. powerplant disassembly and inspection reports, component condition reports mechanical delay and cancellation reports, flight log reports, (pireps) engine shutdown reports, etc.

d Methods of Data Analysis and Application to Maintenance Controls.

(1) A description of the data analysis system to be employed must be included. The following must be adequately covered:

(a) Effects upon maintenance controls: e.g., overhaul time, inspection and check periods or content of overhaul and/ or inspection procedures.

(b) The types of action appropriate to the trend or level of reliability experienced must be described. Such action might be:

1 Actuarial or engineering studies employed to determine need for maintenance programme changes.

2 Maintenance programme changes involving inspection frequency and content, functional checks, overhaul procedures and time limits.

3 Aircraft, aircraft system or component modification or repair.

4 Changes in operating procedures and techniques.

5 Other actions peculiar to the condition that prevails.

(c) Procedures for evaluating critical failures as they occur must be included.

(d) Documentation used to effect changes in maintenance programme must be described. These should include at least those which document maintenance programme changes, modifications and special inspections of fleet campaigns. A reference to the operator's manual which provides the handling procedures for these documents must be included.

1 Results of corrective action programmes must become evident in a reasonable period of time. Depending on the implication of the problemthis might be immediately, or as long as an overhaul cycle.

2 Each corrective action plan or programme must be made a matter of record. Samples of forms used to implement these actions should be included in the programme document.

3 Each corrective action programme must have a planned completion date.

(e) Statistical techniques used to determine operating reliability levels must be described.

(2) Organizational Responsibilities.

(a) The manner in which information is exchanged between organizational elements must be described. This may be portrayed systematically in a diagram.

(b) The activities and responsibility of each organizational element (Engineering, Quality Control, Flight Operations, etc.) and / or reliability control committee must be defined. This must include:

1 Committee membership (if appropriate).

2 Meeting frequency.

3 Reliability programme responsibilities must be clearly delineated this section must include:

(a) The identification of the two organizational elements responsible for approving changes to maintenance controls. Note- one must exercise inspection or quality control responsibility or have overall programme responsibility.

(b) Duties and responsibilities for initiating maintenance programme revisions.

(3) Programme must include a graphic portrayal of programme operation.

(a) It should be a closed loop and show source data, data collection and analysis programme performance achievements, and applicability to the maintenance
controls.

e. Procedures for establishing and revising performance standards.

(1) Each programme must include an initial performance standard that defines the area of acceptable reliability for each aircraft, system (s), and / or components controlled by the programme.

(a) Various methods may be used to evaluate and control performance; e.g., premature removal rates, in-flight shutdown rates, confirmed failure rates, mechanical delay/ cancellation rates, internal leakage rates, etc.

(b) In some cases upper and lower limits may be established. This represents a reliability band or range and provides the standard by which the operator intends to interpret or explain equipment reliability. The corrective action or follow

up requirements for each limit must be fully explained in the document.

(c) In other cases, target numbers may be set to specify aircraft system or component reliability performance levels which the operator expects to achieve. Thesestandards are usually associated with product improvement programmes. A fully explanation of these requirements must be included in the document.

(2) Each programme must describe the methods and data required for establishment of the performance standard. This might include but is not limited to:

(a) Past and present operating experience of an individual operator or of the industry may be used. However , in those cases where industry experience is used, the programme must include a provision that the standard will be review after the operator has gained one year’s operating experience.

(b) Analyses of performance of similar equipment currently in service.

(c) Aircraft manufacturers' or equipment manufacturers' reliability engineering analyses.

(d) History of experience wherein reliability standards were acceptable to the airline industry.

(3) Each programme must contain procedures for monitoring and revising the prescribed performance standard.

(a) The standard established must be responsive and sensitive to the level of reliability experienced.

1. It should be "stable" without being "fixed."

2. It should not be so high that even abnormal

variations would not cause an alert, or low that it is constantly exceeded in spite of the best known corrective action measures.

(b) The organizational element (s) responsible for monitoring and revising the performance standard must be specified.

(c) The what, when, and the how of revising the performance standard must be explained.

(d) The performance standard for each aircraft, aircraft system or component controlled by the programme must be included in the document.

F. Definition of Significant Terms.

(1) Each programme must clearly define the significant terms used in the programme.

(a) Term definitions must reflect their intended use in the programme. Therefore, definitions will vary from programme to programme.

(b) Acronyms or abbreviations peculiar to the programe must also be defined.

(c) Common terms used throughout the industry need not be defined as long as the same meaning is intended.

(d) Terms which are clearly defined in the text of the programme need not be included.

g. Programme Displays and Status of Corrective Action Programmes.

(1) Each programme must describe the reports, charts, and / or graphs used for documenting operating experience. Responsibilities for reports must be established and reporting elements must be clearly identified and described.

(a) The display must contain essential information for every aircraft, aircraft system, and component controlled by the programme.

(b) Each system and component must be identified by the appropriate ATA Specification 100 system code number.

(c) Display must show trends as well as the current month's performance.

1 Graphical or tabular presentations may be used.

2 Generally a minimum of six (6) months experience must be shown. In the case of certain large complex systems, such as the propulsion system, a minimum of twelve (12) months must be presented.

3 The reliability performance standards (alert values) must also be displayed; e.g., shutdown rate, premature removal, etc.

(d) The status of corrective action programmes must be included. This includes corrective action programmes implemented since the last reporting period.

h. Procedures for Programme Revision.

(1) Each programme must contain procedures for implementing changes to the programme.

(a) Procedures must be described in sufficient detail to identify and isolate areas which require DCA approval. The areas requiring DCA approval are:

1. Reliability measurement.

2. Changes involving performance standards, including instructions relating to the development of these standards.

3 Data collection system.

4 Data analysis methods and application to maintenance programme

(b) If the operator proposes that all revisions to the programme document will be approved by the DCA then isolation of areas DCA approval is not required. However, the document must recognize each of the above requirements

and must contain procedures for adequately administering and implementing changes required by these actions.

(c) Programme must identify the organizational element(s) responsible for the approval of amendments to the programme.

(d) Programme must provide for a periodic review to determine that established performance standards is still realistic. The who, what, when, and how to implement these changes should be adequately described.

(e) Programme must provide procedures for distribution of approved revision.

(f) Programme must contain a reference to operator's manual which contains the overhaul and inspection periods, work content, and other maintenance programme activities controlled by the programme. The who, what, and how to implement changes to these requirements must be adequately described.

I Procedures for Maintenance Control Changes.

(1) The programme must describe the procedures to be used for making changes to maintenance controls. These actions must be made a matter of record.

(2) The organizational elements responsible to prepare substantiation reports to justify maintenance control changes must be identified.

(a) At least two separate organizational elements are required, one of which exercises inspection or quality control responsibility for the operator.

(3) The specific parameters used to determine changes in maintenance controls must be spelled out; i.e, samples, functional checks, unscheduled removal, etc.

(4) If sampling is used, the method, number of samples, time on exhibits used as samples, when they will be taken, and at what interval must be clearly explained.

(5) Procedures must be provided to cover all maintenance programme activities controlled by the programme; e.g., overhaul times, periodic services, routine and service checks, phase checks and / or block overhauls.

(6) If appropriate, procedures must be included for changing form hard time to on condition maintenance (Note – this requires DCA approval).

(7) If appropriate, procedures must provided for changes in maintenance programme requirements for emergency equipment.

(8) Procedures must be included relative to manual revisions concerning time increases and what will be required prior to pursuing a subsequent time increase.

(9) Procedures must be provided for revision to the Operations Specifications when and if required.

(10) Procedures must be provided to assure that any TBO adjustment or other maintenance programme change does not conflict with a corrective action programme established by a previous reliability analysis.

(11) Programme document must recognize critical failure and contain instructions for taking corrective action.

(12) Programme must contain a statement that the OFNAC will be advised when increases to time limitations or other programme changes of systems / components controlled by the programme occur.

(13) Operators should be encouraged to include a graphic display of major system / component (airframe / engine) TBO escalation.

4. APPLICATION FOR APPROVAL OF MAINTENANCE RELIABILITY PROGRAMMES

will be made by each certificate holder to the assigned DCA / inspector having certificate responsibility.

a. Programme approval or disapproval will be accomplished by the assigned inspector in accordance with Handbook procedures.

(1) Coordination will be made with the Director, Flight Safety.

(2) Programmes which significantly deviate from the instructions contained in …….. shall be forwarded, with appropriate comments and recommendations to the DCA.

(3) Each application submitted for approval must be accompanied by a document which describes the programme operation. The document must contain the

essentials of operation as described in paragraphs 2 and 3.

b. Each approved programme must be incorporated into the operator's overall maintenance programme by approval of Operation Specifications –Aircraft Maintenance

(1) The entire programme need not be on the Operations Specifications. The certificate holder may identify the document and refer to it in Operation s Specifications by proper identification.

(2) The Operations Specifications must contain:

(a) A statement authorizing the reliability programme. These generally fall into two categories:

1 Those which control the entire aircraft or complete systems; e.g. hydraulics, pneumatics, etc.

2 Those which control individually selected items within a system; e.g. pumps, valves, etc.

(b) The programme document must be properly and adequately identified; e.g., by name, number, and date. Each revision number and date must also be included on the preface page.

(c) The means to identify individually selected items must be specified on the preface page.

(d) The preface page may serve as the sole control as far as Operations Specifications for an entire aircraft, powerplant or system. In those cases, there is no need to list the individual items on the aircraft maintenance specification pages.

(e) A reference to the operator's manual which contains the maintenance controls (e.g., inspection, check and overhaul limitations) must be included on the preface page.

(f) A statement that in the event the programme document referenced is canceled, the maintenance programme covered by the said document will be completely reevaluated and maintenance and overhaul time limits established by the must be included on the preface page.

c To establish uniform Operations Specifications for all operators utilizing provisions of a reliability programme, the instructions and format as shown must be followed.

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

Provided the Maintenance Schedule has been drawn up in accordance with this Technical Standard it serves as the Approved Aircraft Maintenance Schedule 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:

Glider type	Registration V5
Manufacturer	S/No.
Date of manufacture	Total Flying Hours
Total Launches	Engine Type *
S/No.	Hrs. Since New/OH
Propeller Type *	S/No.
Hrs. Since New/OH	Registered Owner:

* Delete whichever is not applicable

2. Hours of engine operation (if applicable):

Engine since new or last overhaul and date of last overhaul *

No. 1 Hrs. No. 1 Date of O/H

Propeller since new or last overhaul/mid-life inspection and date of last overhaul *

No.1 Hrs. No. 1 Date of O/H

* Delete whichever is not applicable

3. Mass and Balance:

Empty Mass kg Date last established:

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 schedule for an aeroplane, as listed in Section B of TS 43.02.8, with the maintenance schedule 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 83º +/- 7º 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.

6. **Main wheel / brake assembly** – Ensure that the main wheel runs true, bearings are quiet, brakes operate and are properly adjusted. Check retract linkages for excess play. Ensure that all mounting brackets are firm and that the retract locks down with a positive over-centre.

7. **Canopy, locks, jettison** – The canopy must be clear, free of distortion, crazing and cracks, and visibility through it not impaired. Hold-down locks must operate smoothly. The jettison must be operational and correctly placarded.

8. **Harness(es)** – Inspect harness straps for excess wear. Ensure that attachments points to fuselage are firm. Ensure that all quick-release systems operate smoothly.

9. **Seat pan assembly(ies)** – Inspect for damage, cracks or loose attachment points. Where the seat-pan base is close to the cockpit floor, ensure that pneumatic tubing and electrical wiring are not pinched.

10. **Cockpit floor structures** – Inspect for damage or cracks. Ensure that all bulkheads, supporting release hooks and control systems are still solidly mounted and firm.

11. **Rudder pedal assemblies** – Inspect for free movement. Check the 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.

12. **Rudder control circuits / stops** – Inspect the stops for excessive 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.

14. **Aileron control circuits / stops** – As for item 12. Ensure that on both sides the aileron going down does not go further than the specified angle. This is important.

15. **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.

16. **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).

17. **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.

18. **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.

19. **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.

20. **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.

21. **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.

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.

23. **Battery / corrosion** – Inspect the battery and connecting wires for condition and corrosion. Ensure that the battery mounting is secure and firm.

24. **Oxygen system** – Inspect pipes for wear, particular on the high-pressure side o f 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.

25. **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.

26. **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.

27. **Removable ballast installation** – Ensure that the ballast retaining mechanism is firm and undamaged. Seat pan ballast should be secured to the seat.

28. **Speed / mass / manoeuvre placards** – These must be installed in the cockpit and be readable.

29. **Wing attachments** - Inspect both wing and fuselage attachment points for damage, cracks or excessive wear.

30. **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.

31. **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.

32. **Center section fairing** – Check for cracks or damage and ensure that all attachment systems operate correctly.

33. **Mainplane struts / wires** – Check that attachment points are firm and undamaged, struts are not dented, bent or corroded, and that wires are nor corroded and the ends not damaged.

34. **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.

35. **Rear fuselage (external)** – Inspect for cracks or impact damage, particular near the tail skid or wheel and in front of the fin.

36. **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.

37. **Fin structure** – Inspect for cracks or damage, particularly where the front of the fin joins the fuselage.

38. **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.

39. **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.

40. **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.

41. **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.

42. **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.

43. **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.

44. **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. Place flaps in full negative position and check that sealing tapes are not too tights 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.

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

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

50. **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.

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.

53. **Mandatory mod's / inspections** – See item 3 'Associated documents' in Section A of Technical Standard 43.02.8 for guidance in respect of mandatory inspections and modifications. Check the glider's logbook in respect of their status.

54. **Colour coding of controls** – Self-explanatory.

55. **Logbook entries** – Inspect with the owner the aircraft's logbook and ensure that it is up to date.

56. **Placarding** – Ensure that all placards are in place as per the manual and in accordance with NAMCAR Parts 24 and 96 in respect of a non-type certificated glider.

57. **Minimum cockpit load placard** – Repeat from previous inspection, unless repairs or re-finishes have been carried out.

58. **Maximum cockpit load placard** – See item 57.

59. **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 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 NAM-CATS 47.

60. **Wing-beat frequency** – The natural frequency of the wings is established, and the count is taken, when the minimum input is 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.

62. **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 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.

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

Item	Description	Status*	Initials	Remarks
1	Nose Fairing			
2	Pot Pitot Ventilator			
3	Front Skid/Shock Absorbers			

4	Front Fuselage Structure			
5	Release Hook Assemblies			
6	Main Wheel/Brake Assembly			
7	Canopy, Locks, Jettison			
8	Harness(es)			
9	Seat Pan Assembly(ies)			
10	Cockpit Floor Structure			
11	Rudder Pedal Assemblies			
12	Rudder Control Circuit/Stops			
13	Elevator Control Circuit/Stops			
14	Aileron Control Circuit/Stops <u>Right Aileron:</u> Up Down <u>Left Aileron:</u> Up Down			
15	Trimmer Control Assemblies Check aileron trim tab(s) and record: <u>L.H. R.H.</u> Up Up Down Down:			
16	Air Brake Control Circuit			
17	Wheel Brake Controls			
18	Instrument Panel Assemblies			
19	Pitot/Static System			
20	ASI Calibration			
21	Altimeter			
22	Electrical Installation/Fuses			
23	Battery/Corrosion			
24	Oxygen System			
25	Radio Installation/Placarding			
26	Water Ballast System			
27	Removable Ballast Installation			
28	Speed/Mass/Manoeuvres Plac’s			
29	Wing Attachments			
30	Control Systems – Centre Section			
31	Equipment Stowed – Centre Section			
32	Centre Section Fairing			
33	Mainplane Struts/Wires			

34	Rear Fuselage (internal)			
35	Rear Fuselage (external)			
36	Tailplane Attachments			
37	Fin Structures			
38	Rudder Assembly and Hinges			<u>Rudder</u> Left Right <u>Rudder trim tab:</u> L R
39	Tailplane/Elevator Assembly			<u>Elevator</u> Up Down <u>Elevator trim tab:</u> Up Down
40	Tail Skid/Wheel			
41	Mainplane Structure (port)			
42	Aileron/Hinge (port)			
43	Air Brake/Spoiler Assembly (port)			
44	Flaps (port and starboard)			
45	Mainplane Structure (starboard)			
46	Aileron/Hinge (starboard)			
47	Air Brake/Spoiler Assembly (stbd)			
48	Range of Controls – Checked			
49	Drag Shute(s)			
50	Bonding/Vents/Drains			
51	Lubrication			
52	Cleanliness/Loose Articles			
53	Mandatory Mod’s/Inspections			
54	Colour Coding of Controls			
55	Log Book Entries			
56	Placarding			
57	Min. Cockpit Load Placard Kg			
58	Max. Cockpit Load Placard Kg			
59	Registration Letters - Correctness			
60	Wing Bending Freq. (cycles/min)			
61	Compass			
62	Fuel Tank(s)			
63	Fuel Flow Check:			Left: Right: All: Off:

64	Record cylinder blow-by for the engine			/80	/80	/80	/80
65	Inspect wooden propeller 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						

* 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

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 flexible hoses shall be renewed every eight years. Record part numbers of any hoses replaced 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 NAMCAR 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. The 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 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:

(a) Record all Airworthiness Directives complied with during this inspection.
(b) Record all recurring Airworthiness Directives complied with during this inspection.
(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, 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 SCHEDULE FOR MANNED BALLOONS (MINIMUM REQUIREMENTS)

Provided the Maintenance Schedule has been drawn up in accordance with the manufacturers and state of design requirements and as a minimum contains the details set out in this Technical Standard it serves as the Approved Aircraft Maintenance Schedule 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 and the state of design requirements shall require the prior approval of the Director.

SAMPLE LAYOUT OF CHECK-LIST, CONTAINING MINIMUM REQUIREMENTS (conduct all checks and test inaccordance with manufacturer requirements to ensure compliance with these requirement)

1. General:

Balloon type Registration V5 S/N

Total Flying Hours

Total Ascents

2. Hours or cycles of operation:

Envelope total time Hrs. Hrs. Ascents

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 No.	Currency date:

6. Record of avionics equipment installed (name, type and serial nos.):

VHS	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 balloon 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)

1. ENVELOPE FABRIC AND LOAD TAPE

(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 grab 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 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 sighs 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 PTEE 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 coup- ling 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 then 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 discolouration 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 SCHEDULE FOR AIRSHIPS (MINIMUM REQUIREMENTS)

Provided the Maintenance Schedule has been drawn up in accordance with this Technical Standard it serves as the Approved Aircraft Maintenance Schedule 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 V5	S/N
Total Flying Hours	Total Ascents	

2. Hours or cycles of operation:

Envelope total time	Hrs. Ascents

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 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 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:

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 flexible hoses shall be renewed every eight years. Record part numbers of any hoses replaced 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 NAMCAR 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. The 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 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:

(a) Record all Airworthiness Directives complied with during this inspection.

(b) Record all recurring Airworthiness Directives complied with during this inspection.

(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, 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 Regulation 2001 as amended, that are applicable thereto have been complied with.

Date Signature

LICENCE OR OTHER APPROVAL NO.:

AMO Name Licence No.
AME Name Licence No.

43.02.9 AIRSPEED INDICATOR AND ALTIMETER SYSTEM TESTS AND INSPECTIONS

1. Tests and inspections

The tests and inspections referred to in NAMCAR 43.02.9(a) are the following:

(1) 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,

Method: evacuate any pitot static pressure system incorporating a static port 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.

Tolerance: 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,

Method: 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.

Tolerance: 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.

(c) Determine that the pitot head/s and static ports heater/s, if installed, are operable.

(d) Ensure that no modification 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.

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

(a) Unless otherwise specified each test for performance may be conducted with the instrument subjected to vibration

(b) 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.

(c) 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.

After one minute, the leakage should not exceed 10 knots, or 7% of the lower speed tested.

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) <u>Scale Error</u>**

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) <u>Hysteresis</u>

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 (2)(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) <u>After effect</u>

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) <u>Friction</u>

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) <u>Case Leak</u>

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) <u>Barometric Scale Error</u>

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.

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

(a) Conduct each test in accordance with 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

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

Table 2: Test tolerances

Test	Tolerance

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

Table 3: Friction

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

Table 4: Pressure altitude

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

Table 5: Airspeed indicator scale tolerance & friction

AIRSPEED INDICATION KNOT / MILES PER HOUR	SCALE ERROR TOLERANCES (KTS / MPH)	FRICTION TOLERANCE (KTS / MPH)
40	± 2,5	± 3
60	± 2,5	± 3
80	± 2,5	± 3

100	± 2,5	± 3
120	± 2,5	± 3
140	± 2,5	± 3
160	+ 2,5 / – 3,5	± 3
180	+ 2,5 / – 3,5	± 3
200	+ 2,5 / – 3,5	± 3
220	+ 2,5 / – 3,5	± 3
250	+ 2,5 / – 3,5	± 3
270	+ 2,5 / – 3,5	± 3
300	+ 3 / – 4	± 3
320	+ 3 / – 4	± 3
350	+ 3 / – 4	± 3
370	+ 3 / – 4	± 3
400	+ 4 / – 5	± 3
430	+ 4 / – 5	± 3
450	+ 4 / – 5	± 3

43.02.10: (43.02.8) ATC TRANSPONDER TESTS AND INSPECTIONS

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 paragraph (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 ± 3 MHz.

(b) For classes 1B, 2B and 3B Mode S transponders, interrogate the transponder and verify that the reply frequency is 1 090 ± 3 MHz.

(c) For classes 1B, 2B and 3B Mode transponders that incorporate the optional 1 090 ± 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 ± 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 dbs (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 P_4 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 P_4 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: (43.02.9) EMERGENCY LOCATOR BEACON TESTS AND INSPECTIONS

1. Tests and inspections

The tests and inspections prescribed in NAMCAR 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 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 (ii) with all electronic equipment operating collectively, evaluating reasonable combinations of control settings and operating modes.

(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) Regulation 91.04.23(3) 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 placarted

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 placarted in accordance with the provisions of subparagraph (i).

(5) Post-flight check

The pilot-in-command of an aircraft, equipped with an ELT, is responsible for its proper operation. As inadvertent activation may have occurred after hard landings and as a result of acrobatic flight, prior to engine shut-down at the end of each flight as part of the post-flight checks the VHF receiver should be tuned to 121,5 MHz to listen for ELT activation. If the ELT has been activated, maintenance may be required before it is returned to service.

[Note: Item (5) is an operational requirement and will be transferred to Technical standard 91.04.23 in due course.]

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 –

(x) be thoroughly familiar with the scope and limitation of the NDT method;

(xi) have a basic knowledge of product technology.

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;

and furthermore –

(vi) should 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

American society for testing and materials ASTM

Aerospace Material Specifications (AMS)

> any approved 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 (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.

3. Welding standard

(1) The welding standard practices acceptable to the Director are:

(a) SAE Standard AMS-STD-1595
(b) International Institute of Welding (IIW) ISO
(c) ASTM standards for welding
(d) any approved by the Director

43.02.15: MODIFICATION AND REPAIR

1. Definitions

(1) Major Modification

Airframe Major Modification. Major modification include but not limited to, modification to the listed aircraft parts, or the listed types of modification (when not included in the applicable aircraft specifications)—

(a) Wings.

(b) Tail surfaces.

(c) Fuselage.

(d) Engine mounts.

(e) Control system.

(f) Landing gear.

(g) Hull or floats

Elements of an airframe including spars, ribs, fittings, shock absorbers, bracing, cowlings, fairings, and balance weights.

Hydraulic and electrical actuating system of components.

Rotor blades.

Changes to the empty weight or empty balance which result in an increase in the maximum Certified weight or centre of gravity limits of the aircraft.

Changes to the basic design of the fuel, oil, cooling, heating, cabin pressurisation, electrical, hydraulic, de-icing, or exhaust systems.

Changes to the wing or to fixed or movable control surfaces which affect flutter and vibration characteristics.

(2) Major powerplant modification, even when not listed in the applicable engine specifications, include but not limited to —

(a) Conversion of an aircraft engine from one approved model to another, involving any changes in compression ratio, propeller reduction gear, impeller gear ratios or the substitution of major engine parts which requires extensive rework and testing of the engine.

(b) Changes to the engine by replacing aircraft engine structural parts with parts not supplied by the original manufacturer or parts not specifically approved by the Authority.

(c) Installation of an accessory which is not approved for the engine.

(d) Removal of accessories that are listed as required equipment on the aircraft or engine specification.

(e) Installation of structural parts other than the type of parts approved for the installation.

(f) Conversions of any sort for the purpose of using fuel of a rating or grade other than that listed in the engine specifications.

(3) Propeller Major Modification. Major propeller modification, when not authorised in the applicable propeller specifications, include but not limited to —

(a) Changes in blade design.

(b) Changes in hub design.

(c) Changes in the governor or control design.

(d) Installation of a propeller governor or feathering system.

(e) Installation of propeller de-icing system.

(f) Installation of parts not approved for the propeller.

(4) Appliance Major Modification. Modification of the basic design not made in accordance with recommendations of the appliance manufacturer or in accordance with applicable Airworthiness Directives are appliance major modification. In addition, changes in the basic design of radio communication and navigation equipment approved under type certification or other authorisation that have an effect on frequency stability, noise level, sensitivity, selectivity, distortion, spurious radiation, automated volume

control (AVC) characteristics, or ability to meet environmental test conditions and other changes that have an effect on the performance of the equipment are also major modification.

(5) Minor modification: is a design change that has a negligible, or no appreciable, effect on the mass, balance, structural strength, reliability, operational characteristics, or other characteristics affecting the airworthiness of the aeronautical product. The accomplishment of minor modifications normally involves use of standard or generally accepted practices.

(6) Major Repairs (Definition)

Airframe Major Repairs. Repairs to the following parts of an airframe and repairs of the following types, involving the strengthening, reinforcing, splicing, and manufacturing of primary structural members or their replacement, when replacement is by fabrication such as riveting or welding, are airframe major repairs.

(a) Box beams.

(b) Monocoque or semimonocoque wings or control surfaces

(c) Wing stringers or chord members

(d) Spars.

(e) Spar flanges.

(f) Members of truss-type beams.

(g) Thin sheet webs of beams.

(h) Keel and chine members of boat hulls or floats.

(i) Corrugated sheet compression members which act as flange material of wings or tail surfaces.

(j) Wing main ribs and compression members.

(k) Wing or tail surface brace struts.

(l) Engine mounts.

(m) Fuselage longerons.

(n) Members of the side truss, horizontal truss, or bulkheads.

(o) Main seat support braces and brackets.

(p) Landing gear brace struts.

(q) Axles.

(r) Wheels.

(s) Parts of the control system such as control columns, pedals, shafts, brackets, or horns.

(t) Repairs involving the substitution of material.

(u) The repair of damaged areas in metal or plywood stressed covering exceeding six inches in any direction.

(v) The repair of portions of skin sheets by making additional seams.

(w) The splicing of skin sheets

(x) The repair of three or more adjacent wing or control surface ribs or the leading edge of wings and control surfaces, between such adjacent ribs.

(y) Repair of fabric covering involving an area greater than that required to repair two adjacent ribs.

(z) Replacement of fabric on fabric covered parts such as wings, fuselages, stabilisers, and control surfaces.

(aa) Repairing, including rebottoming, of removable or integral fuel tanks and oil tanks.

(6) Powerplant Major Repairs. Repairs of the following parts of an engine and repairs of the following types, are powerplant major repairs —

(a) Separation or disassembly of a crankcase or crankshaft of a piston engine equipped with an integral supercharger.

(b) Separation or disassembly of a crankcase or crankshaft of a piston engine equipped with other than spur-type propeller reduction gearing.

(c) Special repairs to structural engine parts by welding, plating, metalising, or other methods.

(7) Propeller Major Repairs. Repairs of the following types to a propeller are propeller major repairs—

(a) Any repairs to or straightening of steel blades.

(b) Repairing or machining of steel hubs.

(c) Shortening of blades.

(d) Retipping of wood propellers.

(e) Replacement of outer laminations on fixed pitch wood propellers.

(f) Repairing elongated bolt holes in the hub of fixed pitch wood propellers.

(g) Inlay work on wood blades.

(h) Repairs to composition blades.

(i) Replacement of tip fabric.

(j) Replacement of plastic covering.

(k) Repair of propeller governors.

(l) Overhaul of controllable pitch propellers.

(m) Repairs to deep dents, cuts, scars, nicks, etc., and straightening of aluminium blades.

(n) The repair or replacement of internal elements of blades.

(8) Appliance Major Repairs. Repairs of the following types to appliances are appliance major repairs—

(a) Calibration and repair of instruments.

(b) Calibration of avionics or computer equipment.

(c) Rewinding the field coil of an electrical accessory.

(d) Complete disassembly of complex hydraulic power valves.

(e) Overhaul of pressure type carburetors, and pressure type fuel, oil, and hydraulic pumps.

(9) A minor repair involves any repair that does not fall under the major repair category, meaning the repair has a negligible effect on the airworthiness of the affected aeronautical product. The accomplishment of minor repairs normally involves use of standard or generally accepted practices.

43.02.16: TEST FLIGHTS

1. General

(1) The flight testing prescribed by NAMCAR 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. Furthermore, Part 24 prescribes who may carry out the proving flights for the issuing of an authority to fly for a non-type certificated 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 FSS-AIR-FORM 102/11for single-engine fixed wing aircraft;

(ii) Form FSS-AIR-FORM 102/11 for multiple-engine fixed wing aircraft; and

(iii) Form FSS-AIR-FORM100/11 for helicopters.

(iv) Form FSS-AIR-FORM101/11 for balloon.

(b) The forms referred to in subparagraph (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 take-off, the altimeter is to be set to 1 013,2 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 5 (five) 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 Form FSS-AIR-FORM101/11.

(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 FSS-AIR-FORM101/11.

43.02.17: TEMPORARY AND PERMANENT REPAIRS AFTER ACCIDENTS OR INCIDENTS

1. Requirements

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:

(1) 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:
  (a) the aircraft's nationality and registration marks and its location;
  (b) the extent of the reported damage;
  (c) a copy of all proposed repairs obtained from the AMO, AME or approved repair facility concerned prior to commencing the repairs; and
  (d) a detailed schedule of all the repairs to be performed by the AMO, AME or approved repair facility.

(2) 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.

(3) 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 subsections (1) and (2) in addition to the requirements prescribed in subsection (4).

(4) The aircraft maintenance organisation (AMO), approved repair facility, or aircraft maintenance engineer (AME) concerned must –

  (a) submit to the Director –

    (i) the name(s) of valid type-rated AMEs who will be responsible for the carrying out of the repairs;

    (ii) a detailed description of the manner in which the repairs are to be effected; and

    (iii) 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;

  (b) 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;

  (c) ensure that only an appropriately licensed and rated person, as prescribed in NAMCAR 43.04.8, certifies the duplicate inspection on all controls when temporary repairs are made to an aircraft;

  (d) supply the area airworthiness inspector with copies of the documentation, referred to in paragraph (a);

(e) 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 Namibia); and

(f) advise the Director in writing when the flight has been completed.

(5) Those responsible for temporary repairs shall ensure that such repairs are carried out in accordance with standard aviation practices or in a reasonable manner.

43.02.18: AIRCRAFT COMPASS REQUIREMENTS

1. Compass swing requirements

(1) All compasses fitted to Namibian registered aircraft must be swung as follows:

(a) On installation.

(b) At 12 monthly intervals thereafter: Provided that where other independent direction-indicating systems 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 5º, the compass shall be swung.

[Note: Whilst under the most favourable conditions an annual check is sufficient, it is recommended that owners 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 effect 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. 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 10 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:

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

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

* 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 NAM-CATS 66 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 (EDTO)

The additional maintenance requirements for extended- diversion time operations prescribed by NAMCAR 43.02.19 are the following:

1. General

(a) The operator maintenance control system which includes the maintenance control manual (MCM) and the aircraft maintenance programme shall contain the standards, guidance and direction necessary to support the intended EDTO. Maintenance 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.

(b) 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.

(c) The basic maintenance programme for the aircraft being considered for EDTO should be the continuing airworthiness maintenance programme currently approved for that operator, for the make and model airframe-engine combination. This programme should be reviewed to ensure that it provides an adequate basis for development of EDTO maintenance equirements. These should include maintenance procedures to preclude common cause human failures without proper verification processes or operational testing prior to EDTO. For two engine aeroplanes, the same person should not perform maintenance action on the same element of identical, but separate, maintenance significant systems during the same routine or non-routine visit. If such dual maintenance actions cannot be avoided, the State of the Operator may allow use of adequate ground tests, inspection procedures, a verification flight or other approved maintenance procedures to preclude common cause human failure modes.

(d) If EDTO-related tasks are identified, then these tasks should be included on the operator's routine work forms and related instructions.

(e) EDTO-related procedures, such as involvement of centralized maintenance control, should be clearly defined in the operator's programme.

(f) Log books should be reviewed and documented as appropriate to ensure proper MEL procedures,

(g) deferred items and maintenance checks and those system verification procedures have been performed.

2. EDTO Manual

The operator shall include the following information in existing manuals used by personnel involved in EDTO. This manual need not include, but should at least refer to the maintenance programme and other requirements described by this chapter and clearly indicate where they are located in the operator's manual system. All EDTO requirements,
including supportive programme procedures, duties and responsibilities, should be identified and be subject to revision control.:

(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. A list of EDTO significant parts should be established and the parts are identified as EDTO significant when received and stored.

5. Verification Programme

The operator should develop a verification programme or establish procedures, to ensure the appropriate corrective action is taken following an engine shut-down, primary system failure, adverse trends or any prescribed events. The corrective action taken may include a verification flight. The operator should also establish means to assure their ccomplishment. A clear description of who should initiate verification actions and the section or group responsible for the determination of what action is necessary should be identified in the programme. Primary systems or conditions requiring verification actions should be described in the operator's MCM or EDTO manual

6. Reliability Programme

A reliability programme that focuses on EDTO significant systems shall be developed or the existing reliability programme supplemented to take account of EDTO. 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 and trends detrimental to EDTO flights. This information shall be readily available for use by the operator and the Directorate to help establish that the reliability level is adequate, and to assess the operator's competence and cability to safely continue EDTO. An EDTO reporting programme must be established which ensures that the Director is notified, at least monthly, on the previous month's activities or more often if adverse trends reportable through this programme are identified.

(1) Procedures for the reduction of the EDTO diversion time must be established and implemented if:
a) a significant event is identified on any flight, including non EDTO flights, involving the air operator's EDTO certified aircraft type; or
b) an adverse trend is identified through the reliability programme; or
c) the root cause of an EDTO significant reliability issue is not identified and/or if there are no identified corrective action. The person responsible for maintenance in accordance with Part 121 has the authority to initiate the reduction of the approved EDTO diversion time.

(2) Where reliability data indicate that the propulsion system reliability this chapter is no longer being met, the director must be notified of the corrective measures taken. Where the
"minimum criteria" are no longer being met, the air operator must reduce the EDTO diversion time to that specified level as determined by the Director for the particular in-flight shut down (IFSD) rate noted. An IFSD could be discounted pursuant to conditions such as the:

a) IFSD is not the result of any action or inaction from the part of the air operator; or

b) IFSD is not the result of any action or inaction from the part of the maintenance provider; or

c) IFSD is the result of an operational incident such as a bird strike at low altitude. When discounting of IFSD, the operator and the State of the Operator must have consensus.

(3) Failure of an operator to reduce the maximum diversion time when required constitutes grounds for removal of EDTO approval.

(4) In addition to the items required to be reported to the State of the Operator, the following items should be included in the reporting programme:

(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;

(v) inability to control the engine or obtain desired power; and
(vi) significant events or adverse trends with EDTO significant systems.

(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
(vii) corrective action.

7. 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.

8. 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.

9. Propulsion system monitoring

The operator's assessment of propulsion systems reliability for the EDTO fleet should be made available to the State of the Operator (with the supporting data) on at least a monthly basis to ensure that the approved maintenance programme continues to maintain the level of reliability necessary for the operator's extended diversion time operational authorization. The assessment should include, as a minimum, engine hours flown in the period, in-flight shut-down rate for all causes and engine removal rate computed on a twelve-month rolling average basis. Any adverse sustained trend would require an immediate evaluation to be accomplished by the operator in consultation with the State of the Operator. The evaluation may result in corrective action or operational restriction being applied.

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 of Document NAM-CATS 91 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 (6) 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.

43.02.21 Aircraft Radio Station Inspection

Any person performing an inspection of an aircraft radio station shall—

(1) examine the maintenance records for service history and compliance with the applicable maintenance rules; and

(2) inspect and test the bonding of mounting racks and shock mounts for a maximum resistance of 0.05 ohms; and

(3) inspect and test the complete radio station for interference between items of equipment; and

(4) inspect and test the audio integration and intercom systems to ensure that— (i) the residual noise level is below -30 dB in the absence of an audio input signal; and

(ii) with input signals of the normal magnitude, the ratio of wanted to unwanted output is not less than 45 dB; and

(5) check that the VSWR of the transmission lines and aerials is less than 3:1 for the following:

(i) VHF Communications:

(ii) HF Communications (T/R to antenna coupler):

(iii) DME; and

(6) check that the system channelling is correct for the following:

(i) VHF Communications:

(ii) HF Communications (T/R to antenna coupler):

(iii) ILS:

(iv) VOR:

(v) DME; and

(7) inspect and test the VHF Communications system to ensure that the performance of the system is acceptable during normal operation; and

(8) inspect and test the HF Communications system to ensure that—

(i) the antenna integrity and insulation resistance is acceptable; and

(ii) the performance of the system is acceptable during normal operation; and

(9) inspect and test the operation of ADF including—

(i) testing the sense antenna for integrity and insulation resistance; and

(ii) testing the audio function; and

(10) inspect and test the operation of ILS receivers with a field test set, including—

(i) testing flag warnings for modulation failure, centre line and glide path accuracies, sense, and course widths; and

(ii) testing the audio function; and

(11) inspect and test the operation of VOR with a field test set, including—

(i) testing flag warnings for modulation failure; and

(ii) omni-radial resolving, and radio magnetic indicators, accuracy at 30° intervals; and

(iii) carrying out ±1° test for freedom of meter movement, sense, and course width; and

(iv) testing the audio function; and

(12) inspect and test the operation of the marker receiver with a field test set including—

(i) testing operations of 400, 1300 and 3000 Hz tones and associated lamps; and

(ii) where fitted, operation of hi/lo sensitivity; and

(13) inspect and test the operation of DME with a field test set, including—

(i) testing range accuracy and ground speed readings; and

(ii) testing the audio function.

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 NAMCAR 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, including the maintenance schedule; 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 referred to in subsection (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 OF MAJOR REPAIRS AND MODIFICATIONS

1. Manner of recording overhaul

The manner in which overhauls, repairs, processes and modifications related to a major repair or overhaul of an aircraft part or component shall be recorded in the applicable aircraft, engine or propeller logbook or on a certificate of release to service as detailed in Annex D.

2. Processing

Copies of the recorded entries, referred to in section 1 above, shall be forwarded to the Director within fourteen days from the completion date of the maintenance in question.

43.03.5 CERTIFYING REVIEW

1. Statement

The statement referred to in CAR 43.03.5(1) (a), is as follows:

I hereby certify that an annual review of maintenance has been carried out and that the requirements of Part 91 (General operating and flight rules) and Part 43 (General maintenance rules) of the Civil Aviation Regulations, 2001, as amended, have been complied with.

43.04.1: CERTIFICATE RELATING TO MAINTENANCE

Annex C

[TS 43.04.1]

CERTIFICATE RELATING TO MAINTENANCE

CERTIFICATE RELATING TO MAINTENANCE
No.
Aircraft type:
Model:
Serial No.
Engine type:
Model:
Serial No.
Propeller type:
Model:
Serial No.
Component type:
Model:
Serial No.
I hereby certify that in carrying out the foregoing specified maintenance, all the requirements prescribed in the Civil Aviation Regulations, 2001 as amended, or appropriate authority which are applicable hereto, have been complied with.
Date: Signature:
LICENCE OR OTHER APPROVAL NO.

CERTIFICATE OF RELEASE TO SERVICE OF AN AIRCRAFT PART OR COMPONENT

USER/INSTALLER RESPONSIBILITIES

[NOTES:

1.

It is important to understand that the existence of this document alone does not automatically constitute authority to install the part/component/assembly.

2.

Where the user/installer works in accordance with the national regulations of an Airworthiness Authority different from the Airworthiness Authority 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 specified in block 1.

3.

Statement 14 does not constitute installation certification. In all cases the aircraft maintenance record must contain an installation certification issued in accordance with the national regulations by the user/installer before the aircraft may be flown.]

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 regulation 43.04.4, is the following:

(1) After a progressive inspection:

"I certify that Phase …… of the progressive inspection programme of (*aircraft) (*component) …… (description) was performed in accordance with its progressive inspection programme and in accordance with the Namibian Civil Aviation Regulations 2001 as amended, and is fit for release 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 continuos airworthiness records."

* *delete as applicable*

or

(2) After any other inspection:

"I certify that (*aircraft) (*component) …… (description) has been inspected in accordance with a …… (identify inspection) inspection and in accordance with the Civil Aviation Regulations, and is fit for release to service."

* *delete as applicable*

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 NAMCAR 43.04.5, is the following:

"The work recorded above has been carried out in accordance with the Namibian Civil Aviation Regulations Part 43, as amended and in respect of that work the (*aircraft) (*component) is fit for release to service.

* *delete as applicable*

"Signature:

"Licence / authorisation number:

"Date of entry:

2. Form of certificate of release to service

The forms referred to in NAMCAR 43.04.5, in which the release to certificate an aircraft or aircraft component is certified, are the forms contained in the in Annexes B1 and B2 or can be obtained from the DCA

43.04.6: DISCREPANCIES

1. Statement

The statement to be entered in the appropriate logbook or flight folio, as prescribed in NAMCAR 43.04.6, is the following:

(1) 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 continuos airworthiness records.";

or

(2) 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 oroperator."

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 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.

(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

Appendix 2

INSPECTION REMINDER

Aircraft registration mark:		
Next inspection due on:	(Date:) or	(Hours:)

Annex B1

[Annexure A]

CERTIFICATE OF RELEASE TO SERVICE

CERTIFICATE OF RELEASE TO SERVICE
FOR
AEROPLANES NOT EXCEEDING MCM OF 5 700
OR
HELICOPTERS NOT EXCEEDING 3 175 KG
OR
GLIDERS
OR
MANNED BALLOONS

Nationality and registration marks

Aircraft type Serial No.

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 of 2001 as amended and the aircraft's Approved Maintenance Programme.

This certificate lapses at a total of

hours of flight time or on
(date), whichever occurs first, unless the aircraft is involved in an accident or becomes unserviceable, in which case the certificate is invalid for the duration of the period.

Signed Licence No.

* (Aircraft maintenance engineer/organisation)

Date Time

* Delete whichever is not applicable

Annex B2

[Annexure A]

(AMO NAME) (AMO NO.) CERTIFICATE OF RELEASE TO SERVICE FOR AEROPLANES ABOVE 5 700 KG AND HELICOPTERS ABOVE 3 175 KG Aircraft Registration V5- …… Type …… Serial No. …… Total Aircraft Hrs. …… Total Cycles ……			
CATEGORY "W" ELECTRICAL	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 2001, as amended and its approved maintenance schedule	TIME DATE	SIGNATURE APPROVAL NO
CATEGORY "W" INSTRUMENTS	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 2001, as amended and its approved maintenance schedule	TIME DATE	SIGNATURE APPROVAL NO
CATEGORY "W" RADIO	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 2001, as amended and its approved maintenance schedule	TIME DATE	SIGNATURE APPROVAL NO
CATEGORY "C" ENGINES	I hereby certify that I am satisfied that all the 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 2001,	TIME DATE	SIGNATURE APPROVAL NO

	as amended and its approved maintenance schedule			
CATEGORY “A” AIRCRAFT	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 2001, as amended and its approved maintenance schedule. NOTE*: This last item must not be signed as finally releasing the aircraft until all the above items have been signed*.	TIME DATE	SIGNATURE APPROVAL NO	
This certificate lapses at a total of …… hours of flight time when check …… will be due or on …… (date), whichever comes first, unless the aircraft is involved in an accident or becomes unserviceable, in which case the certificate is invalid for the duration of the period.				
Extension	This Certificate will now lapse at a total of …… Airframe hours Check …… will be carried out.	Time Date	Signature	Identification Stamp

Annex C

[TS 43.04.5]

CERTIFICATE RELATING TO MAINTENANCE

CERTIFICATE RELATING TO MAINTENANCE		
		No.
Aircraft type:	Model:	Serial No.
Engine type:	Model:	Serial No.
Propeller type:	Model:	Serial No.
Component type:	Model:	Serial No.

I hereby certify that in carrying out the foregoing specified maintenance, all the requirements prescribed in the Civil Aviation Regulations, 2001 as amended , or appropriate authority which are applicable hereto, have been complied with.

Date:

Signature:

LICENCE OR OTHER APPROVAL NO.

CERTIFICATE OF RELEASE TO SERVICE OF AN AIRCRAFT PART OR COMPONENT

USER/INSTALLER RESPONSIBILITIES

[NOTES:

1. ***It is important to understand that the existence of this document alone does not automatically constitute authority to install the part/component/assembly.***

2. ***Where the user/installer works in accordance with the national regulations of an Airworthiness Authority different from the Airworthiness Authority 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 specified in block 1.***

3. ***Statement 14 does not constitute installation certification. In all cases the aircraft maintenance record must contain an installation certification issued in accordance with the national regulations by the user/installer before the aircraft may be flown.]***

Annex D

[Annexure A]

1. Directorate logo	2. CERTIFICATE OF RELEASE TO SERVICE OF AN AIRCRAFT PART OR COMPONENT ISSUED BY AN APPROVED AIRCRAFT MAINTENANCE ORGANISATION				3. Certificate Ref. No.	
4.Organisation approved by Block 1 Authority to issue this Form:					5.Work Order/ Contract/Invoice	
6.Item	7.Description	8.Part No.	9.Eligibility*	10.Quantity	11.Serial/ Batch No.	12.Stat Worl
Remarks						
Limited life parts will normally be accompanied by maintenance history including life used.						
14. ☐CAR 43.03.3 Release to Service ☐CAR 43.03.3 Release to Service The organisation, referred to in block 4, hereby certifies that the work specified above, except as otherwise specified in block 13, was carried out in accordance with Part 43 of the NAM-CAR and in respect to that work, the part(s) or component(s) is(are) considered ready for release to service. (See over)						
15. Signature 16. Stamp			17. Approval Reference Number			
18. Name			19. Date (d/m/y)			

* Installer must cross-check eligibility with applicable technical data

CERTIFICATE OF RELEASE TO SERVICE OF AN AIRCRAFT PART OR COMPONENT

USER/INSTALLER RESPONSIBILITIES

[NOTES:

1. ***It is important to understand that the existence of this document alone does not automatically constitute authority to install the part/component/assembly.***
2. ***Where the user/installer works in accordance with the national regulations of an Airworthiness Authority different from the Airworthiness Authority 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 specified in block 1.***
3. ***Statement 14 does not constitute installation certification. In all cases the aircraft maintenance record must contain an installation certification issued in accordance with the national regulations by the user/installer before the aircraft may be flown.]***

Annex E

[Annexure E]

Acceptable Technical Data

(1) Subject to paragraph (2), the following are acceptable technical data:

(1) a type certificate data sheet:
(2) a foreign type certificate data sheet used for the issue of a type acceptance certificate:
(3) type design data for a type certificated product:
(4) design change data that supports a design change approved by the means specified below:

(a) A design change may be approved by—

(i) including it in an Airworthiness Directive; or
(ii) the approval of a modification; or
(iii) the approval of a change to the type certificate or type acceptance certificate under Subpart D; or
(iv) the acceptance of a supplemental type certificate .

(c) Design changes are acceptable to the Director if they are—

(i) described by technical data listed in this appendix; or
(ii) accepted by the issue of an airworthiness certificate.

(5) data approved by the Director under rule 21.505:
(6) data provided by the Director in an Advisory Circular or Pamphlet:
(7) an airworthiness directive that gives a specific instruction for modification or repair:
(8) 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:
(iii) Transport Canada:
(9) supplemental type approvals issued by Transport Canada:
(10) data giving a specific instruction for modification or repair contained in a maintenance manual, repair manual, overhaul manual, instruction for continued airworthiness, service bulletin, or an equivalent 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:
(11) AC43.13-1B, issued by the Federal Aviation Administration of the United States of America:
(12) data included in and specific to the category of an airworthiness certificate.

(b) The technical data listed in paragraph (a) are acceptable if—

(1) the data is appropriate to the product, component, or appliance, and is directly applicable to the work being carried out; and
(2) 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 is 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
(3) the installer has the written permission of the holder of the supplemental type certificate or supplemental type approval to install the STC; and
(4) 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.