



WELLINGTON NEW ZEALAND

PURSUANT to Section 28 of the Civil Aviation Act 1990

I, MAURICE WILLIAMSON, Minister of Transport,

HEREBY MAKE the following ordinary rules.

SIGNED AT Wellington

This *18* day of *April* 1995

by **MAURICE WILLIAMSON**

Maurice Williamson
Minister of Transport

Civil Aviation Rules

Part 43

General Maintenance Rules

Docket Nr. 1030

Civil Aviation Rules
Part 43

General Maintenance Rules

RULE OBJECTIVE, EXTENT OF CONSULTATION AND COMMENCEMENT

The objective of Part 43 is to establish, for all aircraft, the minimum standard of maintenance considered necessary to ensure the continued validity of the certificate of airworthiness. The rule will also ensure that all aircraft to which the rule applies are maintained to a standard which assures safe operation.

This is achieved by prescribing—

- the minimum standards for the performance of maintenance; and
- the persons who may certify maintenance; and
- the manner in which maintenance is to be recorded and certified; and
- the annual review of maintenance.

In May 1990 the Air Transport Division of the Ministry of Transport published a notice of intention to carry out a complete review of the aviation regulatory system. This notice, in Civil Aviation Information Circular Air 3, listed the areas in which rules would be made and invited interested parties to register their wish to be part of the consultative process. The Register was identified as the Regulatory Review Consultative Group.

A draft of Part 43 was developed by the rules rewrite team in consultation with members of the consultative group. An informal draft was published and distributed in March 1992 and a period of informal consultation followed. This culminated in the issue of Notice of Proposed Rulemaking 94-1 under Docket 1030 on 25 May 1994.

The publication of this notice was advertised in the daily newspapers in the five main provincial centres on 28 May 1994. The notice was mailed to members of the Regulatory Review Consultative Group and to other parties, including overseas Aviation Authorities and organisations, who were considered likely to have an interest in the proposal.

A period of sixty days was allowed for comment on the proposed rule. A further consultation period of 42 days was granted at the request of the Aviation Industry Association. Meetings were held in 36 locations around New Zealand which were attended by some 150 interested persons. Workshops were held during the annual conferences of the Aviation Industry Association and the Society of Licensed Engineers and Technologists. Meetings were also held with the Aviation Industry Association Maintenance Committee and the Aviation Technicians Association.

The submissions and verbal comments were considered and where appropriate the proposed rules amended to take account of the comments made.

The rules as amended were then referred to and signed by the Minister of Transport.

Part 43 comes into force on 1 June 1995.

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Subpart A — General

43.1 **Applicability**

This Part prescribes rules governing—

- (1) the maintenance of aircraft which are required by Part 91 to have an airworthiness certificate issued under Part 21, Subpart H; and
- (2) the release to service after maintenance of aircraft which are required by Part 91 to have an airworthiness certificate issued under Part 21, Subpart H; and
- (3) the maintenance, and the release to service after maintenance, of components to be fitted to aircraft which are required by Part 91 to have an airworthiness certificate issued under Part 21, Subpart H; and
- (4) the annual review of maintenance.

[Until Part 21, Subpart H comes into force on 1 July 1995, an airworthiness certificate is a certificate of airworthiness issued under regulation 161 of the Civil Aviation Regulations 1953]

[Until Part 91 comes into force, the requirement to have an airworthiness certificate is prescribed in regulation 19 of the Civil Aviation Regulations 1953]

43.3 **Definitions**

In this Part—

Control system means a system by which the flight path, attitude, or propulsive force of an aircraft is changed, including the flight, engine and propeller controls, the related system controls and the associated operating mechanisms.

43.5 **Falsification, Reproduction, or Alteration of Maintenance Documentation**

A person shall not make or cause to be made—

- (1) any fraudulent or intentionally false entry in any record or report that is required to be made, kept, or used to show compliance with any requirement under this Part; or

- (2) any reproduction or alteration, for fraudulent purpose, of any record or report made under this Part.

Subpart B — Maintenance

43.51 *Persons To Perform Maintenance*

(a) Except as provided in paragraphs (b) and (c), a person shall not perform maintenance on an aircraft or aircraft component unless they—

- (1) hold an aircraft maintenance engineer licence with an appropriate type rating, issued under Part 65, Subpart D; or
- (2) perform maintenance under the direct supervision of the holder of an aircraft maintenance engineer licence with an appropriate type rating, issued under Part 65, Subpart D, and the maintenance is within the scope of that licence; or
- (3) are authorised by the holder of an appropriate aircraft maintenance organisation certificate, issued under Part 145, to perform maintenance within the scope of that certificate.

(b) A person who holds a pilot licence with an appropriate type rating issued under Part 61 may perform the maintenance listed in Appendix A if—

- (1) the licence holder is the owner or operator of the aircraft; and
- (2) the aircraft is not used on air transport operations.

(c) A person may perform maintenance on a glider or glider component if they—

- (1) are authorised by a gliding organisation to perform maintenance on a glider or glider component; or
- (2) perform the maintenance under the direct supervision of a person authorised by a gliding organisation to perform maintenance on a glider or glider component.

[Until Part 65, Subpart D comes into force, the licence and rating referred to in paragraph (a) shall be a licence and rating issued under Section L of the New Zealand Civil Airworthiness Requirements]

[The gliding organisation in paragraph (c) is the holder of a recreation organisation certificate issued under Part 149 for gliding. Until Part 149 comes into force, the gliding organisation is the New Zealand Gliding Association (Inc) and a person authorised by a glider organisation to perform maintenance is the holder of a glider engineer approval issued by the Director under regulation 19A of the Civil Aviation Regulations 1953]

43.53 Performance of Maintenance

Each person performing maintenance on an aircraft or aircraft component shall—

- (1) have available adequate housing and facilities for the necessary disassembly, proper inspection and reassembly of the aircraft; and
- (2) use methods, techniques and practices that—
 - (i) are prescribed in the current manufacturer's maintenance manual or Instructions for Continued Airworthiness; or
 - (ii) are acceptable to the Director; and
- (3) use the tools, equipment and test apparatus necessary to ensure completion of the work in accordance with standard practices acceptable to the Director; and
- (4) use any special or test equipment recommended by the manufacturer, or equivalent equipment acceptable to the Director; and
- (5) on completion of the maintenance, ensure that the condition of the aircraft or aircraft component is satisfactory for release to service and is at least equal to its original or properly modified condition with regard to—
 - (i) aerodynamic function; and
 - (ii) structural strength; and
 - (iii) resistance to vibration and deterioration; and
 - (iv) other qualities affecting airworthiness; and
- (6) when performing maintenance on an aircraft operated under an air operator certificate issued under Part 119, perform that maintenance in accordance with the operator's maintenance exposition.

[Until Part 119 comes into force, an air operator certificate is deemed for the purposes of subparagraph (6) to be an air service certificate issued under regulation 136 of the Civil Aviation Regulations 1953]

[Until Part 119 comes into force, an air operator's exposition is deemed for the purposes of subparagraph (6) to be an operator's maintenance manual provided under regulation 146 of the Civil Aviation Regulations 1953]

43.55 Recording of Overhaul

A person shall not state in any maintenance document entry required by any CAR that an aircraft, airframe, engine, propeller, or other aircraft component, has been overhauled unless it has been—

- (1) disassembled, cleaned, inspected and repaired as necessary, and reassembled, using methods and techniques acceptable to the Director; and
- (2) tested in accordance with—
 - (i) current standards and technical data acceptable to the Director, which have been developed and documented by the holder of the type certificate, supplemental type certificate or other production approval, issued under Part 21; or
 - (ii) other standards or technical data approved by the Director.

[Until Part 21, Subpart B comes into force on 1 July 1995, a type certificate is a certificate of type approval issued under regulation 163 of the Civil Aviation Regulations 1953]

43.57 Maintenance for IFR Operations

Each person performing an inspection of an aircraft radio station required by Part 91 on an aircraft to be used on IFR operations shall perform the inspection listed in Appendix B.

[Until Part 91 comes into force, the aircraft radio station inspection requirement is prescribed in Section F.6 of the New Zealand Civil Airworthiness Requirements]

43.59 Progressive Inspections

Each person performing a progressive inspection in accordance with a progressive inspection programme approved under Part 91 shall—

- (1) at the start of the progressive inspection cycle, inspect the aircraft completely; and
- (2) after the initial inspection, conduct routine inspections and detailed inspections in accordance with the progressive inspection programme.

[Until Part 91 comes into force, the progressive inspection programme is approved under Section F.6 of the New Zealand Civil Airworthiness Requirements]

43.61 Annual and 100-hour Inspections

Each person performing an annual or 100-hour inspection required by Part 91 shall perform the tests and inspections listed in Appendix C.

[Until Part 91 comes into force, the annual or 100-hour inspection requirement is prescribed in Section F.6 of the New Zealand Civil Airworthiness Requirements]

43.63 Altimeter System Tests and Inspections

Each person performing the altimeter system tests and inspections required by Part 91 shall—

- (1) perform the tests and inspections listed in Appendix D; and
- (2) for the altimeter tests, record on the altimeter case, the date and maximum altitude to which the altimeter has been tested.

[Until Part 91 comes into force, the altimeter system test and inspection requirement is prescribed in Section F.6 of the New Zealand Civil Airworthiness Requirements]

43.65 ATC Transponder Tests and Inspections

Each person performing the ATC transponder test required by Part 91 shall perform the tests and inspections listed in Appendix E.

[Until Part 91 comes into force, the ATC transponder test and inspection requirement is prescribed in Section F.6 of the New Zealand Civil Airworthiness Requirements]

43.67 Emergency Location Beacon Tests and Inspections

Each person performing the emergency location beacon test and inspection required by Part 91 shall perform the tests and inspections listed in Appendix F.

[Until Part 91 comes into force, the emergency location beacon test and inspection requirement is prescribed in Section F.6 of the New Zealand Civil Airworthiness Requirements]

43.69 Inspection Requirements

Each person performing an inspection required by Part 91 or Part 135 shall—

- (1) perform the inspection so as to determine that the aircraft under inspection, or any component of the aircraft, meets all applicable airworthiness requirements; and

- (2) if performing an annual or 100-hour inspection, use a check-list which includes the scope and detail of the items contained in Appendix C.

[Until Part 91 comes into force, an inspection required by Part 91 shall be an inspection required by Section F.6 of the New Zealand Civil Airworthiness Requirements]

[Until Part 135 comes into force an inspection required by Part 135 shall be an inspection required by Section F.2 of the New Zealand Civil Airworthiness Requirements]

43.71 Non-Destructive Testing

Each person performing maintenance on an aircraft or aircraft component where the applicable maintenance data requires a non-destructive test using fluorescent penetrant, magnetic particle, eddy current, ultrasonic or radiography methods shall—

- (1) hold a certificate issued by the CBIP, appropriate to the technique being used, or an equivalent certificate acceptable to the Director; and
- (2) perform the non-destructive testing using appropriate methods, techniques and practices acceptable to the Director.

43.73 Airworthiness Limitations

Each person performing maintenance specified in the Airworthiness Limitations section of a manufacturer's maintenance manual or Instructions for Continued Airworthiness, shall perform the maintenance in accordance with that section.

43.75 Maintenance Records

- (a) Each person performing maintenance on an aircraft or aircraft component shall record, on completion of the maintenance—
 - (1) details of the maintenance including, where applicable, the identity of the inspection and any approved data used; and
 - (2) for a progressive inspection, whether a detailed inspection or routine inspection of the particular components or areas of the aircraft was carried out; and
 - (3) the serial numbers, if any, of components removed or fitted; and
 - (4) details of measurements or test results obtained, including the results of any ground or air tests; and

- (5) for the altimeter system test and inspection, the date and maximum altitude to which the altimeter has been tested; and
 - (6) the date of completion; and
 - (7) the name of the person completing the maintenance, if other than the person certifying release to service; and
 - (8) the location and, where applicable, the name of the facility where the maintenance was carried out; and
 - (9) where maintenance has been performed as a consequence of the failure of any part, or damage caused by forced landing or accident, the reasons for performing the maintenance.
- (b) The person performing the maintenance shall—
- (1) record the details required by paragraph (a) in the appropriate logbook or in a maintenance record acceptable to the Director; and
 - (2) record the details legibly and in ink or other permanent material; and
 - (3) where worksheets or other associated maintenance records are used to document the detail of the maintenance task—
 - (i) reference those records in the logbook, or in the maintenance record acceptable to the Director; and
 - (ii) retain the records for the applicable periods specified in Part 91.

[Until Part 91 comes into force, the applicable periods are those prescribed in regulation 197 of the Civil Aviation Regulations 1953]

43.77 Recording of Major Repairs and Modifications

[This rule is suspended until applied by notice in the New Zealand Gazette and will come into force concurrently with Part 65, Subpart F— Inspection Authorisations]

Each person performing a major repair or a major modification shall, in addition to the entry required by 43.75, record the modification or repair, and process the approved form, in the manner prescribed in Appendix G.

Subpart C — Release to Service

43.101 Persons To Certify Release

- (a) Except as provided in paragraph (b), a person shall not certify an aircraft or aircraft component for release to service after maintenance unless they—
- (1) hold an aircraft maintenance engineer licence issued under Part 65, Subpart D, with an appropriate type rating, and, for major repairs or major modifications, an inspection authorisation issued under Part 65, Subpart F; or
 - (2) are authorised by the holder of an appropriate aircraft maintenance organisation certificate issued under Part 145, to certify maintenance within the scope of that certificate; or
 - (3) are approved by the Director to certify an aircraft or aircraft component for release to service; or
 - (4) hold a pilot licence and have performed the maintenance under the conditions prescribed in 43.51(b); or
 - (5) for maintenance performed outside New Zealand, hold a licence issued by a contracting state of ICAO for the type of aircraft or aircraft component.
- (b) A person may certify a glider or glider component for release to service after maintenance if they are authorised to certify maintenance on a glider or glider component by a gliding organisation.

[Until Part 65, Subpart D comes into force a licence or type rating is deemed for the purpose of subparagraph (1) to be a licence or type rating issued under the Civil Aviation Regulations 1953 and Section L of the New Zealand Civil Airworthiness Requirements]

[The gliding organisation in paragraph (b) is the holder of a recreation organisation certificate issued under Part 149 for gliding. Until Part 149 comes into force, the gliding organisation is the New Zealand Gliding Association (Inc) and a person authorised by a glider organisation to perform maintenance is the holder of a glider engineer approval issued by the Director under regulation 19A of the Civil Aviation Regulations 1953]

43.103 Certifying Requirements

A person shall not certify an aircraft or aircraft component for release to service after maintenance unless that maintenance has been performed in accordance with the current CAR and, in respect of that maintenance, the aircraft or aircraft component is fit for release to service.

43.105 Certifying After Maintenance

(a) Each person who certifies an aircraft or aircraft component for release to service after maintenance shall enter in the appropriate logbook or other maintenance record acceptable to the Director—

- (1) the following statement after the recorded details required by 43.75:

The work recorded above has been carried out in accordance with the New Zealand Civil Aviation Rules currently in force and in respect of that work the aircraft is fit for release to service

; and

- (2) beside the statement, their signature, licence or approval number, and the date of entry.

(b) Where components are not installed on, or allocated to an aircraft, the person certifying release to service shall certify the release to service on CAA Form One.

43.107 Certifying After Inspections

Each person who certifies an aircraft or aircraft component for release to service after performing any inspection required by Part 91 or Part 135 shall enter in the appropriate logbook, or other maintenance record acceptable to the Director—

- (1) one of the following statements:

- (i) after a progressive inspection:

I certify that a routine inspection of this [aircraft or aircraft component] and a detailed inspection of this [aircraft component] was performed in accordance with a progressive inspection programme and in accordance with current New Zealand Civil Aviation Rules, and the [aircraft or aircraft component] is fit for release to service

- (ii) after any other inspection:

I certify that this [aircraft or aircraft component] has been inspected in accordance with a [identify inspection] inspection and in accordance with current New Zealand Civil Aviation Rules, and is fit for release to service

; and

- (2) their signature, licence number or authorisation, and the date of the entry.

[Until Part 91 comes into force, an inspection required by Part 91 shall be an inspection required by Section F.6 of the New Zealand Civil Airworthiness Requirements]

[Until Part 135 comes into force, an inspection required by Part 135 shall be an inspection required by Section F.2 of the New Zealand Civil Airworthiness Requirements]

43.109 Discrepancies

Each person performing an inspection required by Part 91 or Part 135 who does not release the aircraft or aircraft component to service shall—

- (1) provide the owner or operator with a signed and dated list of the discrepancies, including any equipment which is placarded *Inoperative* under subparagraph (2) where they find that the aircraft—
 - (i) is unairworthy; or
 - (ii) does not meet the applicable type certificate data, airworthiness directives or other approved data upon which its airworthiness depends;; and
- (2) for those items permitted to be inoperative under Part 91, place a placard on each inoperative instrument and the cockpit controls of each item of inoperative equipment, marking each item *Inoperative*; and
- (3) enter one of the following statements in the appropriate logbook or technical log:
 - (i) after a progressive inspection:

I certify that a routine inspection of this [aircraft or aircraft component] and a detailed inspection of this [aircraft component] was performed in accordance with a progressive inspection programme and the [aircraft or aircraft component] is not released to service. A list of discrepancies and unairworthy items dated [date] has been provided to the aircraft owner or operator
 - (ii) after any other inspection:

I certify that this [aircraft or aircraft component] has been inspected in accordance with a [identify inspection] inspection and is not released to service. A list of

discrepancies and unairworthy items dated [date] has been provided to the owner or operator

; and

- (4) enter their signature, licence number or authorisation, and the date of the entry.

[Until Part 91 comes into force, an inspection required by Part 91 shall be an inspection required by Section F.6 of New Zealand Civil Airworthiness Requirements]

[Until Part 91 comes into force, the items permitted to be inoperative under subparagraph (2) are those prescribed by regulation 109 of the Civil Aviation Regulations 1953]

[Until Part 135 comes into force, an inspection required by Part 135 shall be an inspection required by Section F.2 of New Zealand Civil Airworthiness Requirements]

43.111 Flight Manual Data

Where the approved data for a modification or repair to an aircraft or aircraft component includes changes to the operating limitations or flight data in the aircraft flight manual, the certifying person shall not certify the release to service until the changes have been incorporated into the flight manual.

43.113 Duplicate Inspection of Controls

(a) A person shall not certify an aircraft or aircraft component for release to service after the initial assembly, subsequent disturbance, or adjustment of any part of an aircraft or component control system unless—

- (1) a duplicate safety inspection of the control system has been performed; and
- (2) the duplicate safety inspection is recorded and certified in the appropriate logbook, or other maintenance record acceptable to the Director, in a form and manner acceptable to the Director.

(b) A duplicate safety inspection required by paragraph (a) shall consist of—

- (1) an inspection by a person authorised under 43.101 to certify the release to service of the control system after maintenance; and
- (2) a second inspection carried out by another person who—
 - (i) has adequate training, knowledge and experience to carry out the second inspection; and
 - (ii) is nominated by the person specified in subparagraph (1).

43.115 Ground Running Checks — Reciprocating Engines

A person shall not certify a reciprocating engined aircraft for release to service after an annual or 100-hour inspection unless they ensure that—

- (1) a ground run of the aircraft engine or engines has been performed to determine satisfactory performance, in accordance with the manufacturer's recommendations, for—
 - (i) the power output (static and idle RPM); and
 - (ii) the ignition system or systems; and
 - (iii) the fuel and oil pressure; and
 - (iv) the cylinder or coolant temperature, and oil temperature; and
- (2) the ambient conditions of temperature and atmospheric pressure and the details of the results are recorded—
 - (i) in the appropriate engine or aircraft logbook; or
 - (ii) in a maintenance record acceptable to the Director.

43.117 Ground Running Checks — Turbine Engine

A person shall not certify a turbine engine powered aircraft for release to service after an annual or 100-hour inspection unless they ensure that—

- (1) a ground run of the aircraft engine or engines has been performed to determine satisfactory performance in accordance with the manufacturer's recommendations; and
- (2) the ambient conditions of temperature and atmospheric pressure and the details of the results are recorded in—
 - (i) the appropriate engine or aircraft logbook; or
 - (ii) a maintenance record acceptable to the Director.

43.119 Technical Log Completion

A person shall not certify an aircraft or aircraft component for release to service in an aircraft technical log unless each applicable section of the technical log is completed, including details of any deferred rectification.

Subpart D — Annual Review of Maintenance

[The provisions of Subpart D are suspended until applied by notice in the New Zealand Gazette and will come into force concurrently with Part 65, Subpart F — Inspection Authorisations]

43.151 Persons To Perform Review

(a) Except as provided in paragraph (b), a person shall not perform an annual review of maintenance for an aircraft unless they hold an inspection authorisation issued under Part 65, Subpart F.

(b) A person may perform an annual review of maintenance on a glider or glider component if they are authorised to perform an annual review of maintenance on a glider or glider component by a gliding organisation.

[The gliding organisation in paragraph (b) is the holder of a recreation organisation certificate issued under Part 149 for gliding. Until Part 149 comes into force, the gliding organisation is the New Zealand Gliding Association (Inc) and a person authorised by a glider organisation to perform maintenance is the holder of a glider engineer approval issued by the Director under regulation 19A of the Civil Aviation Regulations 1953]

43.153 Review Requirements

Each person performing an annual review of maintenance for an aircraft shall, before certifying that the review has been carried out, ensure that---

- (1) the aircraft conforms to its type certificate and any approved modifications; and
- (2) all due maintenance specified in the applicable maintenance programme has been completed; and
- (3) all applicable airworthiness directives have been complied with; and
- (4) each discrepancy recorded in the technical log has been actioned certified in accordance with Part 91; and
- (5) all applicable releases to service have been completed and certified in accordance with Subpart C; and
- (6) all components' overhaul and finite lives are within the limits laid down in the applicable maintenance programme.

- (1) the following statement in the aircraft logbook or other approved technical record:

I hereby certify that an annual review of maintenance has been carried out and that the requirements of Part 91 and Part 43 of the New Zealand Civil Aviation Rules have been complied with

; and

- (2) beside the statement required by subparagraph (1), their signature, licence or authorisation number, and the date of the entry; and
- (3) in the appropriate section of the aircraft technical log, the date of the review.

Appendix A—Pilot Maintenance

- (a) Replacement of landing gear tyres or tail skid shoes.
- (b) Greasing and lubrication that does not require disassembly other than removal of access panels.
- (c) Simple, temporary, fabric patch repairs where—
 - (1) the repair is not applied to any flying control surface; and
 - (2) the repair does not require the removal of any control surface or structural parts; and
 - (3) the repair does not involve restringing or rib stitching.
- (d) Restoration of damaged or worn decorative coatings and application of preservative or protective material to components, provided the work does not involve—
 - (1) removal or disassembly of any primary structure; or
 - (2) disturbance of any operating system; or
 - (3) control surface restoration, preservation, or protection.
- (e) Simple, temporary, repairs to fairings or non-structural cover plates.
- (f) Replacing side windows, provided the work does not interfere with the structure or any operating system.
- (g) Replacing fuses and lights.
- (h) Replenishment of hydraulic fluid in hydraulic reservoirs.
- (i) Installation and removal of role equipment if—
 - (1) the installation of the particular equipment has been approved; and
 - (2) the approved aircraft flight manual incorporates the necessary information for safe operation with the equipment installed, including weight and balance data for each configuration.

Appendix B—Aircraft Radio Station Inspection

- (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:
 - (1) VHF Comm:
 - (2) HF Comm (T/R to antenna coupler).

[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) Inspect and test the HF antenna for integrity and insulation resistance.
- (f) Inspect and test the operation of ILS receivers with an approved field test set, including—
 - (1) testing flag warnings for modulation failure, centre line accuracies, sense and course widths; and
 - (2) testing the audio function.
- (g) Inspect and test the operation of VOR with an approved field test set, including—
 - (1) testing flag warnings for modulation failure; and
 - (2) omni-radial resolving, and radio magnetic indicators, accuracy at 30° intervals; and
 - (3) carrying out $\pm 1^\circ$ test for freedom of meter movement, sense and course width; and
 - (4) testing the audio function.
- (h) Inspect and test the operation of marker receiver with an approved field test set including—
 - (1) testing operations of 400, 1300 and 3000 Hz tones and associated lamps; and
 - (2) where fitted, operation of hi/lo sensitivity.
- (i) Inspect and test the operation of DME with an approved field test set, including—

- (1) testing range accuracy and ground speed readings; and
- (2) testing the audio function.

Appendix C—Annual and 100-hour Inspection

General

The aircraft and its components shall first be thoroughly cleaned.

The inspection shall be a thorough functional and visual check of the designated system, component, assembly or installation.

The inspection shall be conducted with all inspection panels, access doors, detachable fairings and fillets, removed.

Adequate lighting and, where necessary, inspection aids such as mirrors, torches, and work stands, shall be used.

Inspections

- (a) All items are to be inspected for general condition which includes, as applicable, the following:
 - (1) correct operation, full and free movement in the correct sense:
 - (2) correct rigging, alignment and tension:
 - (3) appropriate lubrication:
 - (4) correct fluid quantities or levels:
 - (5) correct gaseous pressures:
 - (6) security and cleanliness:
 - (7) wear within acceptable limits:
 - (8) no loose or missing fasteners:
 - (9) vents free from obstruction:
 - (10) correct clearance:
 - (11) bonding straps correctly positioned, undamaged and secure:
 - (12) freedom from excessive—
 - (i) leakage; and
 - (ii) corrosion, or deterioration of protective treatments; and

- (iii) cracks and disbonds; and
- (iv) deformation, scoring, chafing, flat spots and fraying; and
- (v) obstruction or other obvious damage; and
- (vi) burning, arcing or heat damage.

(b) The following items shall be inspected as detailed using the general inspection criteria of paragraph (a):

- (1) the components of the fuselage and hull group including—
 - (i) fabric and skin, for deterioration, distortion, other evidence of failure, and defective or insecure attachment of fittings; and
 - (ii) systems and components, for improper installation, apparent defects, and unsatisfactory operation:
- (2) the components of the cabin and cockpit group including—
 - (i) cabin and cockpit generally, for uncleanliness and loose equipment that might foul the controls; and
 - (ii) seats and safety belts, for poor condition, apparent defects, and security of adjustment devices; and
 - (iii) windows and windshields, for deterioration and breakage; and
 - (iv) instruments, for poor condition, mounting, marking, and, where practicable, improper operation; and
 - (v) flight and engine controls, for improper installation and improper operation; and
 - (vi) batteries, for improper installation and improper charge; and
 - (vii) all systems, for improper installation, poor general condition, apparent and obvious defects, and insecurity of attachment:
- (3) the components of the engine and nacelle group including—
 - (i) engine section, for visual evidence of excessive oil, fuel, or hydraulic leaks, and sources of such leaks; and
 - (ii) studs and nuts, for improper torquing and obvious defects; and

- (iii) internal engine, for metal particles or foreign matter on screens and sump drain plugs. If there is weak cylinder compression, for improper internal condition and improper internal tolerances; and
 - (iv) engine mount(s), for cracks, looseness of mounting, and looseness of engine to mount(s); and
 - (v) flexible vibration dampeners, for poor condition and deterioration; and
 - (vi) engine controls, for defects, improper travel, and improper safety; and
 - (vii) lines, hoses and clamps, for leaks, improper condition and looseness; and
 - (viii) exhaust stacks, for cracks, defects, and improper attachment; and
 - (ix) accessories, for apparent defects and insecurity of mounting; and
 - (x) all systems, for improper installation, poor general condition, defects and insecure attachments; and
 - (xi) cowlings, for cracks and defects:
- (4) the components of the landing gear group including—
- (i) all units, for poor condition and insecurity of attachment; and
 - (ii) linkages, trusses and members, for undue or excessive wear, fatigue and distortion; and
 - (iii) shock absorbing devices, for improper charge; and
 - (iv) retracting and locking mechanism, for improper operation; and
 - (v) hydraulic lines, for leakage; and
 - (vi) the electrical system, for chafing and improper operation of switches; and
 - (vii) wheels, for cracks, defects and condition of bearings; and
 - (viii) tyres for wear and cuts; and
 - (ix) brakes, for improper adjustment; and

- (x) floats and skis, for insecure attachment and, obvious or apparent, defects:
- (5) all components of the wing and centre section assembly, for poor general condition, fabric or skin deterioration, distortion, evidence of failure and insecurity of attachment:
- (6) all components and systems that make up the complete empennage assembly, for poor general condition, fabric or skin deterioration, distortion, evidence of failure, insecure attachment, improper component installation and improper component operation:
- (7) the components of the propeller group including—
 - (i) propeller assembly, for cracks, nicks, binds and oil leakage; and
 - (ii) bolts, for improper torquing and lack of safety; and
 - (iii) anti-icing devices, for improper operations and obvious defects; and
 - (iv) control mechanisms, for improper operation, insecure mounting and restricted travel:
- (8) the components of the radio group including—
 - (i) radio and electronic equipment, for improper installation and insecure mounting; and
 - (ii) wiring and conduits, for improper routing, insecure mounting and obvious defects; and
 - (iii) bonding and shielding, for improper installation and poor condition; and
 - (iv) antenna including trailing antenna, for poor condition, insecure mounting and improper operation:
- (9) each installed miscellaneous item that is not otherwise covered by this listing for improper installation and improper operation.

Appendix D—Altimeter System Tests and Inspections

(a) The static pressure system test:

- (1) ensure freedom from entrapped moisture and restrictions:
- (2) ensure the leakage is within the following established tolerances:
 - (i) for unpressurised aeroplanes, evacuate the static pressure system to a pressure differential of approximately 1 inch of mercury or to a reading, on the altimeter, 1000 feet above the aircraft elevation at the time of the test. Without additional pumping for a period of 1 minute, the loss of indicated altitude must not exceed 100 feet on the altimeter:
 - (ii) for pressurised aeroplanes, evacuate the static pressure system until a pressure differential equivalent to the maximum cabin differential for which the aeroplane is type certificated is achieved. Without additional pumping for a period of 1 minute, 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:
- (3) determine that the static port heater, if installed, is operative:
- (4) ensure that no alterations or deformations of the airframe surface have been made that would affect the relationship between air pressure in the static pressure system and true ambient static air pressure for any flight condition.

(b) The altimeter test:

- (1) Unless otherwise specified each test for performance may be conducted with the instrument subjected to vibration. When tests are conducted with the temperature substantially different from an ambient temperature of approximately 25 degrees Celsius allowance should be made for the variation from the specified condition.
- (2) Altimeter tests shall be carried out by an appropriately rated organisation certificated under Part 145 in accordance with the following:
 - (i) **Scale Error** The altimeter shall, with the barometric pressure scale at 1013.25 millibars, be subjected successively to pressures corresponding to the altitude listed in Table I up to

the maximum normally expected operating altitude of the aircraft in which the altimeter is to be installed.

The reduction in pressure shall be made at a rate not exceeding 20 000 feet per minute to within approximately 2000 feet of the test point.

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

The altimeter shall 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 I:

- (ii) **Hysteresis** The hysteresis test shall 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)(i) and the hysteresis test shall commence while the altimeter is at this pressure.

Pressure shall be increased at a rate simulating a descent in altitude at the rate of 5000 to 20 000 feet per minute until within 3000 feet of the first test point (50 percent of maximum altitude).

The test point shall then be approached at a rate of approximately 3000 feet per minute.

The altimeter shall 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 shall 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 shall 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 shall 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 shall not differ by more than the tolerance specified in Table II from the reading of the altimeter for the corresponding altitude recorded during the scale error test prescribed in subparagraph (2)(i):

- (iii) **After effect** Not more than 5 minutes after the completion of the hysteresis test prescribed in subparagraph (2)(ii), the reading of the altimeter, corrected for any change in atmospheric pressure, shall not differ from the original atmospheric pressure reading by more than the tolerance specified in Table II:
- (iv) **Friction** The altimeter shall be subjected to a steady rate of decrease of pressure approximating 750 feet per minute. At each altitude listed in Table III, the change in reading of the pointers after vibration shall not exceed the corresponding tolerance listed in Table III:
- (v) **Case Leak** The leakage of the altimeter case, when the pressure within it corresponds to an altitude of 18 000 feet, shall not change the altimeter reading by more than the tolerance shown in Table II during an interval of 1 minute:
- (vi) **Barometric Scale Error** At constant atmospheric pressure, the barometric pressure scale shall be set at each of the pressures, falling within its range of adjustment, that are listed in Table IV, and shall cause the pointer to indicate the equivalent altitude shown in Table IV with a tolerance of 25 feet.

- (3) 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 which are acceptable to the Director.

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

- (1) Conduct each test in accordance with paragraph (b):
- (2) 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.

- (3) The difference between the automatic reporting output and the altitude displayed at the altimeter shall not exceed 125 feet.

TABLE 1— SCALE ERROR

Altitude	Equivalent pressure (millibars)	Tolerance \pm (feet)	Altitude	Equivalent pressure (millibars)	Tolerance \pm (feet)
1000	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
1000	977.15	20	20 000	465.62	130
1500	959.51	25	22 000	427.89	140
2000	942.10	30	25 000	376.01	155
3000	908.10	30	30 000	300.87	180
4000	875.09	35	35 000	238.43	205
6000	811.97	40	40 000	187.53	230
8000	752.61	60	45 000	147.47	255
10 000	696.12	80	50 000	115.98	280
12 000	644.38	90			

TABLE II — TEST TOLERANCES

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

TABLE III — FRICTION

Altitude (feet)	Tolerance ±(feet)
1000	70
2000	70
3000	70
5000	70
10 000	80
15 000	90
20 000	100
25 000	120
30 000	140
35 000	160
40 000	180
50 000	250

**TABLE IV — PRESSURE
ALTITUDE**

Pressure in Millibars	Altitude (feet)
951.55	-1727
965.10	-1340
982.03	-863
998.96	-392
1013.25	0
1032.82	+531
1046.37	+893
1049.41	+974

Appendix E—ATC Transponder Tests and Inspections

The ATC transponder tests may be conducted using a bench check or portable test equipment.

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.

For Mode S, operate the test equipment at a nominal rate of 50 Mode S interrogations per second.

An additional 3 dB loss is allowed to compensate for antenna coupling errors during receiver sensitivity measurements conducted in accordance with paragraph (c)(2) below when using portable test equipment.

(a) Radio Reply Frequency Test:

- (1) for all classes of ATCRBS transponders, interrogate the transponder and verify that the reply frequency is 1090 ± 3 MHz:
- (2) for classes 1B, 2B and 3B Mode S transponders, interrogate the transponder and verify that the reply frequency is 1090 ± 3 MHz:
- (3) for classes 1B, 2B and 3B Mode S transponders that incorporate the optional 1090 ± 1 MHz reply frequency, interrogate the transponder and verify that the reply frequency is correct:
- (4) for classes 1A, 2A, 3A and 4 Mode S transponders, interrogate the transponder and verify that the reply frequency is 1090 ± 1 MHz:

(b) 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 1000 Mode 3/A interrogations per second or when Classes 1A and 2A ATCRBS Transponders, or Classes 1B, 2A, 3A and 4 Mode S transponders are interrogated at a rate between 230 and 1200 Mode 3/A interrogations per second—

- (i) 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
- (ii) 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:

(c) **Receiver Sensitivity Test:**

- (1) 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:
- (2) 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:

(d) **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 paragraph (c)(1):

- (i) for class 1A and 2A ATCRBS transponders, the minimum RF peak output power is at least 21.0 dbw (125 watts):
- (ii) for class 1B and 2B ATCRBS transponders, the minimum RF peak output power is at least 18.5 dbw (70 watts):
- (iii) for class 1A, 2A, 3A and 4 and those Class 1B, 2B and 3B Mode S transponders that include the optional high RF peak output power, the minimum RF peak output power is at least 21.0 dbw (125 watts):
- (iv) for class 1B, 2B and 3B Mode S transponders, the minimum RF peak output power is at least 18.5 dbw (70 watts):
- (v) 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):

(e) **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:

(f) **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:

(g) **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:

(h) **Mode S All-Call Interrogations Test:**

interrogate the Mode S transponder with the Mode S-only all-call format UF=11, and the ATCRBS/Mode S all-call formats (1.6 microsecond P₄ pulse) and verify that the correct address and capability are reported in the replies (downlink format DF=11):

(i) **ATCRBS-Only All-Call Interrogation Test:**

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

(j) **Squitter Test:**

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

[The tests in paragraphs (e) through (j) apply only to Mode S transponders]

Appendix F—Emergency Location Beacon Tests and Inspections

- (a) Inspect the beacon and mountings for general condition particularly for corrosion or corrosion deposits.
- (b) Test the impact switch for correct operation.
- (c) Test the transmitter output, using an appropriate test set, to ensure that the output meets the manufacturer's specification.
- (d) Replace the battery if it has exceeded its expiry date or the transmitter has been in use for more than one cumulative hour.

Appendix G—[Reserved]

CONSULTATION DETAILS

(This statement does not form part of the rules contained in Part 43.
It provides details of the consultation undertaken in making the rules.)

Background to the Rules

In April 1988 the Swedavia - McGregor Report on Civil Aviation Regulation in New Zealand was completed. This report concluded that aviation safety should be a joint responsibility of both the Authority and the participants in the civil aviation system. There was widespread agreement that a complete overhaul of the civil aviation regulatory system was necessary. As a result, the Government enacted the Civil Aviation Act 1990 to implement the first stage of the report's recommendations. To implement the remaining recommendations of the report the Air Transport Division of the Ministry of Transport is undertaking a complete review and rewrite of all existing civil aviation legislation.

Considerable research was carried out to decide the format for the new legislation. The Authority decided that the most suitable legislative framework should incorporate the best features from the existing United States of America Federal Aviation Administration (FAA) regulatory system and from the system being developed by the European Joint Aviation Authorities (JAA). The European Joint Aviation Requirements (JAR) are being structured similarly to the Federal Aviation Regulations (FAR) of the FAA and aim to achieve maximum harmonisation while allowing for national variations. It is also essential in the present trans Tasman open skies environment that our new legislation is compatible with that of Australia.

New Zealand's revised legislation will be published as Civil Aviation Rules (CAR) divided into Parts. Each Part will set out a series of individual rules that relate to a particular aviation activity.

Accompanying each Part of the CAR will be at least one associated Advisory Circular (AC). These will expand, in an informative way, specific requirements of the CAR Part and show an acceptable means of compliance. For example, an AC will contain the minimum acceptable practice or practices that will be necessary to meet the rules.

The CAR numbering system is based on the FAR Part numbering system. As a general principle the subject matter of a CAR Part will harmonise with the FAR, although the title may differ to suit New Zealand terminology. Where a proposed CAR Part does not readily equate with a FAR number code, a number has been selected that does not conflict with any existing FAR Part.

The FAR has been used as the start point for the development of many CAR, but there are likely to be differences in the content of each Part of the Rules. The structure and content of Part 43 generally follows the content of the FAR. Changes have been made to conform to New Zealand legal practices and terminology.

The objective of the new rules system is to strike a balance of responsibility between the state authority and those who provide services and exercise privileges in the civil aviation system. This balance must enable the state authority to maintain continuing regulatory control and supervision while providing the maximum flexibility for participants to develop their own means of compliance.

Section 30 of the Civil Aviation Act 1990 (the Act) allows the Minister to make rules setting standards for the maintenance of aircraft and aircraft components. Section 12 of the Act requires the holders of documents to carry out their activities safely and in accordance with the relevant prescribed safety standards and practices.

Notice of Proposed Rule Making

To provide public notice of, and opportunity for comment on, the proposed new rules, the Authority issued Notice of Proposed Rule Making 94-1 under Docket Number 1030. This Notice proposed the introduction of Civil Aviation Rules Part 43 to provide the minimum standard of maintenance for aircraft.

Supplementary Information

All comments made on the Notice of Proposed Rule Making are available in the rules docket for examination by interested persons. A report summarising each substantive contact with the Civil Aviation Authority contact person concerning this rule making has been filed in the docket.

Availability of the Document

Any person may view a copy of these rules at Aviation House, 1 Market Grove, Lower Hutt. Copies may be obtained from Publishing Solutions Ltd, PO Box 983, Wellington 6015, Telephone 0800 800 359.

Summary of Comments on Docket Number 1030 NPRM

1. General Comments on the NPRM

Meetings were held at 36 locations around New Zealand during the consultation period and some 150 interested persons attended. Twenty six written responses to the NPRM were received. Meetings were also held with The Society of Licensed Engineers and Technologists (SLAET), the Aviation Industry Association (AIA) and the Aviation Technicians Association. A presentation was made to the Aviation Industry Association Annual Conference. This summary addresses both written comments and significant comments raised at the consultative meetings.

1.1 General positive comments

1.1.1 One commenter stated that the NPRM was well presented with a good summary and background.

1.1.2 One commenter stated that overall the rule looks good.

1.1.3 The Guild of Air Pilots and Navigators acknowledged receipt of the NPRM but did not wish to comment.

1.1.4 The Aircraft Owners and Pilots Association considered that overall the proposed Part 43 is workable and will benefit private owners and operators.

1.1.5 Airwork New Zealand considered that Part 43 was a well presented and workable rule.

1.1.6 Mount Cook Airline supported the principles and concept of the proposed Part 43 but emphasised that the rule must be appropriate for New Zealand.

1.1.7 Two commenters supported the proposal to introduce a Technical log for all aircraft.

1.2 General cautionary comments

1.2.1 One commenter expressed disappointment with the document.

1.2.2 One commenter was concerned that the rule should be kept as simple as possible but gave no specific examples of how this should be done.

1.2.3 Five of the written comments stated that it was somewhat difficult to fully assess the proposal without having in place Parts 65, 91 and 135 which interlink with Part 43. This view was also expressed by the Aviation Industry Association and The Society of Licensed Aircraft Engineers and Technologists.

CAA response: The CAA agrees that assessment of the working relationship between Part 43 and Parts 65 and 91 is made more difficult by the fact that the latter two rules have not yet been published. In the case of Part 91, relevant extracts from the draft of the proposed rule were provided in the NPRM to help address this problem. Also, in addressing the various consultation meetings some time has been spent on explaining these relationships.

It is possible to put Part 43 into operation without Part 65 and 91 also being in place, but this requires adequate notes and cross references to the existing requirements. Notes have been added to Part 43 as necessary.

The section of the rule relating to the annual review of maintenance will be suspended until such time as the Inspection Authorisation is introduced by Part 65, Subpart F. If any incompatibilities become apparent during the development and consultation of Part 65, Subpart D and F, or Part 91 then any necessary amendments will be introduced to Part 43 at that time.

1.2.4 Some members of the AIA Engineering Committee and the SLAET expressed concern that the removal of the requirement for organisational certification for companies or individuals carrying out maintenance under Part 43 would lead to a degradation in standards of maintenance. References have been made to "palm tree" maintenance and "car boot" maintenance as being activities likely to occur under these proposals.

1.2.5 One commenter asked why it was not proposed to issue a minor repair station approval under Part 43.

CAA response: The CAA does not share these concerns. Part of the intent of the new rules system is to return responsibility to industry participants where this can be safely achieved. The present system of certification of small maintenance organisations has not been regarded as successful by industry or the CAA. The requirement for these small "organisations", which in many cases consist of one or two individuals, to produce and work to a manual has not had any significant safety benefit. At the same time it has cost industry a considerable sum to maintain this approval system both directly and through CAA charges.

The CAA considers that in these circumstances, where relatively small "organisations" are maintaining relatively simple aircraft, little scope exists for variations in procedures which justify individual organisational manuals. Part 43 provides a set of minimum conditions under which the qualified, licensed aircraft maintenance engineer can safely carry out maintenance. Part 43, together with its associated Advisory Circulars, effectively replaces the Engineering Procedures Manual which these small firms struggled to produce and comply with. Part 43 provides specific requirements for particular

maintenance activities and the associated Advisory Circulars provide acceptable practices which will satisfy the rule.

Part 43 also introduces the annual review of maintenance, requiring each aircraft to be inspected annually for conformity and compliance with the general requirements of the CAA Rules by a person holding an inspection authorisation. The CAA considers that this requirement will provide a far more effective quality assurance function than that presently provided by the CAA.

Under the present regulations licensed aircraft maintenance engineers are able to exercise the privileges of their licence in maintaining private aircraft without any further CAA approval. They are required by the present regulations to carry out maintenance under "approved conditions". The CAA considers that the requirements of 43.53, setting standards for performance of maintenance, provide a more precise requirement than presently exists. However it is accepted that, as in FAR Part 43, there is no reference to the need to have acceptable working conditions. The CAA agrees that this is necessary and a further paragraph has been added to 43.53 requiring adequate housing and facilities. An Advisory Circular will address what are acceptable conditions.

1.2.6 One commenter was concerned that some confusion could occur as a result of the revocation of regulations and the transfer of requirements from the regulations to the Rules.

CAA response: It is inevitable that there will be some difficulty during the implementation of the new rules, at least until the new system is fully in place and all regulations are revoked. The only way to ease this is to maintain open lines of communication between the aviation industry and the CAA. The revocation of regulations and transfer of requirements is dealt with in the transitional provisions attached to the Final Rule. It is important that all persons affected by the rules read and understand the transitional arrangements and, if in doubt about a particular point, that they ask advice from the CAA.

1.2.7 One commenter expressed concern that deviation from the base FAR document may affect the application and context of some rules although it was considered that this may be taken care of with the publication of Parts 91, 135 and 121.

CAA response: The CAA agrees that where a foreign document, such as FAR Part 43, is used as the basis for a New Zealand rule it is important to ensure that the original context is maintained. It is essential that where changes are made a full understanding is gained of the original document. Every effort has been made in Part 43 to retain the intent of the original document.

1.2.8 *Three commenters considered that aircraft eligible to be maintained under Part 43 should be fully maintained under Part 43, including the overhaul of simple engines and components presently required to be carried out under Part 145.*

CAA response: This proposal has been widely canvassed in the industry consultation of Part 43 but does not have widespread industry support. It would be a significant departure from the present situation to allow overhaul functions to be performed outside of a certificated organisation. The CAA accepts that this view has some merit and would align with the US situation. However it is considered that the recent relaxation in requirements for component overhaul of non air transport aircraft and the removal of the certification requirements under Part 43 will need to be assessed over a period of time before further relaxation is made.

1.2.9 *One commenter considered that confusion still existed regarding the demarcations of minor and major maintenance.*

CAA response: The demarcation between major and minor maintenance has long been a subject of discord between industry and the CAA. The application of the terms has been a matter of subjective judgement by all involved. In developing the new maintenance rules a decision was made that the best way to deal with this conflict was to stop applying those terms to maintenance.

The demarcation is now effected by using the applicability requirements of Part 145. In future, maintenance will be either maintenance performed under Part 145 or maintenance performed under Part 43. All maintenance which comes within the applicability of Part 145 will be carried out in a Part 145 facility.

In the case of modifications and repairs, where a more specific and accepted definition exists, the terms major and minor will continue to be used. The definitions originate in Part 21 and will be included in Part 1. Where modifications or repairs are classified as major they will need to be released to service by the holder of an inspection authorisation or an authorised signatory within a certificated maintenance organisation. These requirements have been covered in 43.77 and 43.101.

1.2.10 *One commenter considered that there needed to be a rule to cover the accomplishment and certification of major repairs and modifications.*

CAA response: The CAA agrees that this is a necessary component of Part 43. The subject was omitted from the original draft as the content of Part 65, with which it needed to align, had not been fully developed. Sufficient discussion has now taken place with the industry regarding the proposals for Part 65 to allow this requirement to be included as 43.77. Provision for the certification of major repairs and major modifications has been added to 43.101.

1.2.11 *One commenter asked how Duplicate Inspections are to be dealt with and this question was raised a number of times during consultation.*

CAA response: Duplicate inspections do not appear in FAR 43 and for this reason were not included in the NPRM. The CAA considers that in the airline environment the need for duplicate inspections of critical points should be addressed by the operator and form a part of the maintenance programme. However, the CAA accepts that this is not a practical option in the area of maintenance covered by Part 43. The scope for variations in the application of these inspections is also limited. It would seem that industry generally would prefer the CAA to mandate and specify the safety checks required. A new rule, 43.113, has been raised to cover the requirement. The Advisory Circular provides more detailed means of compliance.

1.2.12 *One commenter considered that quality systems should be encouraged for maintainers using Part 43.*

CAA response: The CAA agrees that a quality systems approach should be encouraged for all participants in aviation. However for small organisation such as those covered by Part 43 a fully documented quality system and audit programme is not considered to be cost effective. In this environment quality rests almost entirely with individuals who should be encouraged to provide whatever sort of quality system is appropriate for their work.

2. Specific Comments on the Proposed Rules

2.1 43.1 Applicability

2.1.1 *One commenter suggested that some amendments could be made to the wording of 43.1(a) and 43.1(b) to improve readability and understanding.*

CAA response: The CAA agrees and amendments have been made.

2.2 43.3 Definitions

2.2. *One commenter considered that a definition was required for the terms "major repair" and "major modification".*

CAA response:-The CAA agrees and has introduced into Part 1, Definitions and Abbreviations, the definitions contained in the FAR for these terms.

2.2.3 *One commenter considered that a definition of "airworthy" should be included.*

CAA response: The CAA agrees that it is necessary that there should be a clear understanding of what constitutes an airworthy aircraft or component, but does not consider that a definition is the best way to achieve this. The issue will be addressed in the Advisory Circular in order to provide clarification.

2.2.4 *One commenter proposed that there should be a definition for the "technical log"*

CAA response: The Civil Aviation Authority does not wish to define the technical log. It is preferred that a clear indication is given of the details which must be recorded in the technical log. These details have been proposed in the informal draft of Part 91 as a requirement placed on the aircraft operator. The technical log will be introduced as an amendment to NZCAR F6 and further refined during the consultation process of Part 91.

2.2.5 *One commenter considered that the reference to "overhaul" in the definition of "detailed inspection" is confusing.*

CAA response: The CAA agrees that the wording of this definition could be misinterpreted. The wording is the same as that used in the FAR. The definition has been amended to remove the reference to overhaul and an explanation will be given in the Advisory Circular with regard to maintenance operations which can be classed as a "detailed inspection".

2.3 43.5 Falsification, Reproduction, or Alteration of Maintenance Documentation

This is a new rule introduced to cover falsification or alteration of maintenance documents. This provision appears in the FAR. When Part 43 was drafted the CAA believed that Section 52 of the Civil Aviation Act made adequate provision for this. The CAA now considers that it is necessary to have a specific provision in the rule where there is a requirement to provide records.

2.4 43.51 Persons To Perform Maintenance

2.4.1 *One commenter suggested that the wording of 43.51(2) was confusing. It was suggested that the wording could be interpreted as meaning that a certificated maintenance organisation could approve any staff member to perform any maintenance whether or not it was within the scope of its certificate.*

CAA response: The wording has been modified to ensure that the intent is clear, that an organisation may only authorise its staff within the scope of its certificate.

2.4.2 *Four commenters suggested that the scope of work allowed to be completed and certified by pilots under 43.51(4) was too restrictive. Other commenters suggested that the privileges could be extended to pilots working on Air Transport aircraft*

CAA response: The privileges granted to pilots under 43.51(4) follow to a large extent the privileges granted to pilots by FAR 43. A study of the legislation of a number of other countries has shown similar approaches to the issue. The CAA will consider publishing a consultative document once Part 43 is published to discuss expanding the provisions of Appendix A.

The nomination of persons to work on Air Transport aircraft is a privilege of the certificated operator through its controller of maintenance. An operator can nominate a pilot to carry out and certify maintenance provided that it can show in its exposition that it has a means to ensure that the pilot is competent to carry out the task.

2.5 43.53 Performance of Maintenance

2.5.1 *Although there were no written comments to this effect, a number of verbal commenters were concerned that in the absence of "approved" organisations under Part 43, the environmental conditions under which maintenance is carried out could deteriorate. There is no equivalent provision in Part 43 to that in regulation 174 of the Civil Aviation Regulations 1953, for work to be carried out under "approved conditions".*

CAA response: The CAA agrees and provision been made in 43.53 that persons performing maintenance should have available adequate housing and facilities for the work to be carried out. Further guidance on acceptable means of meeting this requirement will be given in the Advisory Circular.

2.5.2 *One commenter proposed that wording be added to 43.53(4) so that the person performing the maintenance must consider whether the aircraft or component is fit for release to service.*

CAA response: The CAA agrees that this is a reasonable expectation of a person performing maintenance and the rule has been amended to require this.

2.5.3 *One commenter suggested that 43.53(4) is redundant if 43.52(1) is complied with.*

CAA response: The CAA does not agree. The two paragraphs address different issues. Rule 43.53(1) requires adherence to acceptable techniques and practices whereas 43.53(4) requires that the finished product meets its original approved specification.

2.6 43.55 Maintenance of Rotorcraft

2.6.1 *Two commenters considered that this requirement would be more appropriately place in Appendix C. Similar comments were received during the informal consultation of the rule.*

CAA response: The CAA agrees and the content of the rule has been transferred to Appendix C.

2.6.2 *One commenter suggested that additional words be added to this rule to the effect that "All work should be in conformity with the conditions and specifications prescribed in the manufacturers documentation"*

CAA response: The CAA believes that this requirement is fully covered by 43.53(2).

2.7 43.55 Recording of Overhaul

FAR Part 43 has a provision regarding the requirements to be met before certification of overhaul can be given. During the drafting of Part 43 it was thought that this rule was not relevant to the New Zealand situation. During the consultation process it has become apparent that, with the change to "on condition" maintenance for privately operated aircraft, there was considerable misunderstanding of the conditions governing overhaul. This rule has been drafted to overcome this situation and clarify the conditions which must be met in carrying out an overhaul. Information has been included in the Advisory Circular, based on NZCAR F18 and F19 plus various relevant FAA Advisory Circulars, to provide acceptable practices meeting the requirement of the rule.

2.8 43.57 Maintenance for IFR Operations

2.8.1 *One commenter asked if this rule implied that radios used on VFR operations could be maintained "on condition".*

CAA response: The maintenance of all equipment fitted to an aircraft is governed by the requirements of Part 91 and Part 43, Appendix C. All aircraft must have as a minimum a 100-hour or annual inspection each twelve months. Appendix C prescribes the minimum level of inspection which must be carried out. All equipment fitted to the aircraft must be inspected for security, condition and correct operation. This means in the case of a radio that it must operate in accordance with the manufacturer's specification.

The CAA considers that all equipment in an aircraft is maintained "on condition", it is only the means used to establish that condition which varies. The information recently published on this subject in AIC AIR 3 is included in the Advisory Circular.

2.8.2 *One commenter suggested that the wording of this rule be changed from "to be used on IFR operations" to "equipped for IFR operations"*

CAA response: The CAA disagrees with this proposal. Part 91 places the responsibility on the aircraft operator to ensure that the aircraft only carries out operations for which it is equipped. It also places the responsibility on the aircraft operator to ensure that the aircraft is not used on specific operations unless certain maintenance has been carried out. An aircraft does not need to be maintained to an IFR standard unless the operator intends to use it for IFR operations.

2.8.3 *One commenter stated that Appendix B should contain a requirement for all installed avionic equipment to be checked annually if the aircraft is to operate IFR.*

CAA response: Appendix B only provides additional in depth testing of the navigational equipment of aircraft to be used on IFR. It is complementary to Appendix C which requires that all of the avionic equipment is checked for correct operation each 100 hours or twelve months. Appendix C applies to the whole aircraft under any operating circumstances and Appendices B and D are additional to Appendix C under specific circumstances.

2.8.4 *One commenter considered that 43.59(2) should have added words to make it clear that the routine and detailed inspections only commenced after the initial inspection.*

CAA response: The rule has been amended to clarify this.

2.9 43.61 Annual and 100 hour Inspections

2.9.1 *Three commenters considered that the rule was not sufficiently clear that Appendix C is the minimum maintenance that is acceptable. As presently written it prevents the application of a higher standard.*

CAA response: The CAA did not intend the rule to preclude persons choosing to maintain their aircraft to a higher standard than that prescribed in Appendix C. The terminology used is similar to that of FAR Part 43 but on further examination it is considered that it could be more clearly worded.

Part 91 General Operating and Flight Rules will detail aircraft operator responsibilities for maintenance. Part 91 will require the operator to have a maintenance programme detailing an aircraft's maintenance. Part 91 will also require that an aircraft is not flown unless within the previous twelve months it has been inspected to the standard detailed in Appendix C.

Most manufacturers' recommended maintenance programmes meet the minimum requirement of Appendix C and in most cases provide a greater level of detail and type specific information. Only where the manufacturer does not provide a maintenance programme, or where the programme provided is inadequate, will the minimum standard of Appendix C be utilised.

The requirement to use a checklist containing the items listed in Appendix C, is now transferred to 43.69 Inspection Requirements as this is considered a more appropriate place.

2.10 43.63 Altimeter Test and Inspections

2.10.1 *One commenter considered that there was little value in marking the test data on the instrument. In their opinion the markings would not remain in place until the next inspection.*

CAA response: The marking on the instrument is related to the maximum altitude to which the altimeter has been tested and the date of test. This is provided so that the person fitting the instrument can record that information in the aircraft log book. Part 91 will require that an aircraft shall not be flown on IFR unless the altimeter has been tested within the previous two years and shall not be flown beyond the altitude at which the altimeter has been tested. Unless this information is put in the log book the operator will not know the limitations placed on the operation of the aircraft. We may require, under Part 91, that this information to be put into the technical log.

2.11 43.65 ATC Transponder Tests and Inspections

2.11.1 *One commenter suggested that the requirement should also call up inspection to Appendix D paragraph (c) relating to Automatic Pressure Altitude Reporting Equipment. This inspection is presently required under the Altimeter System Inspection.*

CAA response: The CAA considers that these inspections in Part 43 are adequate and appropriate.

There are a number of requirements in Part 91 which prescribe compliance with the Appendices of Part 43.

Appendices D and E are required to be applied in full each two years. In this case presumably the two inspections will be performed at the same time and there is an interface between the two in respect of the integration test.

Paragraph (a) of Appendix D (system leak check) and paragraph (a) of Appendix E (transponder radio reply frequency tests) are required to be carried out whenever the static pressure system is disturbed.

Paragraph (c) of Appendix D (Automatic Pressure Altitude Reporting Equipment and ATC Transponder System Integration Test) is required to be carried out following installation or maintenance on the automatic pressure altitude reporting system of the ATC transponder where data correspondence error could be introduced.

Appendix C (Annual or 100-hour inspection) also requires that the transponder system, as with all systems on the aircraft, be inspected for condition and correct operation.

2.11.2 One commenter suggested that ATC transponders should be maintained on condition and that Air Traffic Control would inform the operator that his system was deficient and deny entry to controlled airspace.

CAA response: The CAA does not consider that a simple operational check is a satisfactory way to deal with equipment that is considered vital for the safe use of airspace. If the equipment transmits incorrect or spurious signals this can affect the safety of other airspace users. It is essential that the transponder continues to operate within the specifications to which it was originally certificated. This overall condition and performance can only be checked using approved test equipment and to an appropriate schedule.

The CAA has received correspondence from Airways Corporation expressing concern at the number of transponder malfunctions which they currently have to deal with. They proposed that the test schedule be tightened. The CAA considers that the test schedule is adequate but that the application of the tests may need to be more rigidly adhered to.

2.12 43.67 Emergency Location Beacon Tests and Inspections

2.12.1 One commenter asked if the inspection period for ELB's could be extended to 24 months to align with the other required avionic checks.

CAA response: This period is presently set in Section F 6 of New Zealand Civil Airworthiness Requirements. When the requirement is transferred to Part 91 this issue will be canvassed in the consultation process.

2.13 43.69 Non Destructive Testing

2.13.1 A number of commenters considered that the requirement for NDT to be performed only in a Part 145 organisation was unduly restrictive. It was considered that a qualified operator with adequate equipment and using acceptable techniques was fully capable of producing work to a high standard. Other suggested that the wording of the rule could be improved to allow the Director more flexibility.

CAA response: The CAA agrees that the requirement perform NDT only under a Part 145 Certificate is unnecessarily restrictive. The rule has been reworded to allow the work to be done by a qualified (CBIP) practitioner using methods techniques and practices acceptable to the Director. The Advisory Circular contains information as to what constitutes an acceptable means of compliance. The rule is now numbered 43.71

2.14 43.73 Documentation

2.14.1 *One commenter considered that there was inconsistency in the use of the terms maintenance programme , inspection programme and inspection schedule.*

2.14.2 *One commenter suggested that the terminology of the wording was restrictive and should be changed to allow the use of other types of maintenance record.*

2.14.3 *One commenter stated that the rule seemed to be totally focused on inspections and did not consider non routine work and rectification.*

CAA response: The CAA has re examined the source document FAR Part 43 and considers that the rule in the NPRM did not have the same effect. The requirement relating to documentation is relevant only to inspections. The requirements for recording the details of unscheduled maintenance are found in 43.75. The requirement has been moved into 43.69 , a new rule headed Inspection Requirements. The word "checklist" is retained as it is considered that in this context it is correct. It is intended to mean a list of the items to be inspected with provision for the person doing the work to indicate that it has been done. Any document which provides this can be considered to be a "checklist" and this is explained in the Advisory Circular.

2.15 43.75 Records-Logbooks

The rule is now retitled "Maintenance Records".

2.15.1 *One commenter questioned the necessity of recording measurements and test results as required in 43.75(a)(4).*

CAA response: The CAA considers it essential that where tests and inspections require some sort of measurement, or comparison of data obtained from a test against a standard, the results should be recorded. This is necessary both as a check that the inspection was satisfactory and for a future reference when the check is repeated. This is particularly important where 'on condition' maintenance methods are employed.

2.15.2 *One commenter considered that there should be a requirement to record all defects and discrepancies.*

CAA response: 43.75(a)(1) requires that the details of all maintenance must be entered in the logbook. Under the circumstances where a defect or discrepancy is found and rectified, a log book entry is required. Where the deficiency is not rectified 43.109 provides the action to be taken to record the deficiency and notify the operator.

2.15.3 *One commenter considered that 43.75(a)(2) was unnecessary as the requirement is covered in (a)(1).*

CAA response: The CAA believes that this paragraph is specific to progressive inspections and therefore needs to be retained.

2.15.4 *Two commenters suggested that the statement in 43.75 (c) was unduly onerous and needed to be reworded or clarified.*

CAA response: The CAA has amended this rule to make its intent clearer.

2.16 43.77 Recording of Major Repairs and Modifications

2.16.1 *One commenter considered that there was inadequate provision for major repair and modification.*

CAA response: This rule has been added to provide requirements for the recording of major repairs and modifications. As stated in the NPRM it is intended to adopt the Form 337 system as used in the FAR and a new Appendix G will provide the detailed operating conditions.

2.17 43.101 Persons to Certify Release

2.17.1 *One commenter considered that it was possible to interpret 43.101(6) as meaning that certification for work done out side of New Zealand could not be made by a person holding a New Zealand document.*

CAA response: The CAA considers that each subparagraph provides a separate means of certification. Subparagraph (6) merely provides an alternative means of certification to subparagraph (1) but does not override the authority of subparagraph (1). A person meeting the requirements of subparagraph (1) can certify the aircraft under any circumstances whether inside or outside of New Zealand.

2.17.2 *One commenter suggested that paragraph 43.101(5) should be amended to read "...the holder of a licence or authorisation issued by ...".*

2.17.3 *One commenter asked if 43.101(5) was intended to cover only a complete aircraft used on private operations.*

CAA response: The CAA does not agree with the first comment. This provision is only intended to allow the use of documents which follow the ICAO format. The CAA has no means to authenticate other forms of authorisation. The provision will apply only in the case of privately operated aircraft and would cover any certification privileges of the foreign licence, whether for the complete aircraft or a component. Rule 43.101(5) is not intended to apply to circumstances where an air transport operator is obtaining maintenance services from an overseas contractor. In this case any authorisation to certify should be issued by the New Zealand organisation contracting out the work. In these circumstances, the foreign licence or authorisation may form the basis for issuing the New Zealand authorisation but this process would need to be agreed by the CAA and included in the New Zealand organisation's exposition.

2.17.4 Two commenters pointed out that as drafted 43.101(3) did not make sense.

CAA response: The CAA agrees. A typographical error caused some words to be omitted from this paragraph and this has been corrected.

2.17.5 One commenter asked what provision is made for aircraft or components sent overseas for maintenance. Another commenter suggested that the rule should allow certification by the manufacture or a foreign Part 145 equivalent organisation.

CAA response: The sourcing of components, where there is a requirement for the component to be maintained under Part 145, should be under the control of a Part 145 organisation. The Part 145 organisation must satisfy itself that the subcontractor or supplier meets the standards of Part 145.

Advisory Circular 145-01 contains guidance as to how this can be achieved. The FAA and the JAA have standardised, as far as they are able, their release documents FAA 8130-3 and JAA Form One. These documents are becoming the worldwide standard for the acceptance of components. Manufacturers and organisations certificated under FAR Part 145 or JAR 145 use these forms, and components released on them are acceptable to the CAA.

The proposed CAA Form One is based upon these forms. The CAA is reviewing the existing release requirements of NZCAR E5 and an Advisory Circular will be developed for Part 43/145 to address this issue.

2.17.6 One commenter was concerned that the changes to the requirements for release to service certification will require changes in the AME licensing structure and privileges.

CAA response: The CAA agrees that some changes are necessary but these issues are being debated in the consultation process of Part 65 Subpart D. The CAA considers that issues relating to any changes required by Part 43 have been well debated and have gained general acceptance.

2.18 43.103 Form and Content of Certification

This rule has now been split into three rules to distinguish between general certification requirements, and the certification requirements after maintenance and after inspections. The titles of these new rules are

43.103 Certifying Requirements

43.105 Certifying after Maintenance

43.107 Certifying after Inspections

2.18.1 *Three commenters proposed changes to the wording of the certificate of release to service. They considered that the statement should certify to meeting all current rules and requirements.*

CAA response: The CAA agrees and the wording has been incorporated into 43.103 and 43.105.

2.18.2 *Four commenters considered that an alternative means of giving the certificate of release to service should be provided. This could be similar to the present provision of regulation 199 that a signature, licence number and the date entered alongside a log entry constitutes a certificate.*

CAA response: The CAA considers it is important for certifying engineers to be fully aware of their legal obligations when certifying the release to service of an aircraft or aircraft component. The act of entering the release statement prior to signing the release to service provides a timely reminder. The statement need not be handwritten but can be in the form of a stamp or be preprinted on to loose leaf pages. The statement can also cover a number of maintenance operations performed at the same time provided it is made clear what maintenance is actually covered by the release.

2.18.3 *Two commenters considered that it was unnecessary, when certifying maintenance, to require the name of the person certifying as well as the signature and licence number. It was considered that the licence or authorisation number was adequate for identification purposes.*

CAA response: The CAA agrees and the rule has been amended.

2.18.4 *Two commenters considered that the form number referenced in 43.103 (d) was inappropriate and should be simplified. They also commented that the number did not align with any other national authority form.*

CAA response: The CAA agrees with these comments. The form will be re-identified as CAA Form One. This aligns with the designation of the JAA form on which the CAA form is based and will allow easier acceptance of the form by overseas authorities.

2.18.5 One commenter considered that the technical log was not an appropriate place to make a certificate of release to service.

CAA response: The technical log, which will be introduced in Part 91, is intended to make provision for the entry and clearance of defects arising while the aircraft is away from the place where the logbooks are kept. If defects are cleared or other maintenance carried out under these circumstances then the CAA considers that the technical log is the appropriate place for the required maintenance entry and release to service.

2.18.6 One commenter considered that insufficient supporting information is provided relating to the changes from certificate of compliance/maintenance release to the certificate of release to service.

CAA response: It is considered that the redrafting of 43.103 into three separate rules has increased the clarity of the rules with respect to certificates of release to service. The advisory circular has been expanded to ensure that a better understanding of this issue is provided.

2.18.7 One commenter questioned why changes to the aircraft maintenance manual were not included in 43.103(d).

CAA response: Any changes to an aircraft or component maintenance manual which are brought about by a modification should be addressed during the design change approval process. If a change to a maintenance manual is required and approved during this process then the only action required of the engineer is to ensure that the maintenance manual being used incorporates that change. It is required by 43.53 that a person performing maintenance uses only current data, which means amended to the latest revision status. The CAA does not consider that this requirement needs to be included in this rule.

2.18.8 Another commenter suggested that the wording of 43.103(d) did not really align with the intent of the FAR.

The CAA has reviewed the requirements of the FAR and agrees that some change in context has occurred. The content of 43.103(d) has been transferred into a new rule 43.111, headed Flight Manual Data. The wording of the requirement has been changed so that the certifying person is now required, before certifying, to ensure that such changes are incorporated into the flight manual rather than being required to make the changes.

2.19 43.109 Discrepancies

The content of this rule was previously in 43.105 in the NPRM and titled Non Release to Service.

2.19.1 One commenter agreed with the objective of the rule but considered that it should apply only when carrying out inspections.

2.19.2 One commenter considered that the rule was different from the FAR.

CAA response: The CAA agrees, on review of the rule, that the original intent of FAR Part 43 was not met. The rule has been amended to apply only to inspections.

2.19.3 One commenter suggested that a copy of any deficiency list issued to the owner should be sent to the CAA.

CAA response: The CAA considers that it is sufficient for the certifying person to make the required entry in the log book and give a list of the deficiencies to the owner. As the list of deficiencies will be raised as the result of an inspection, it is expected that the deficiencies will also be recorded in the worksheets for the inspection. The CAA does not wish to receive a copy of each discrepancy list raised.

2.19.4 One commenter suggested that the rule should be deleted entirely. Their reasoning for this being that if the aircraft is unairworthy then, in terms of 43.53(4), no certification can be made.

CAA response: The CAA agrees that 43.53 prevents release to service when an aircraft or component is unairworthy. However it was at industry request that this provision of FAR 43 was included. The argument advanced was that it would deter operators from "hawking" their aircraft around a number of maintainers to find one who would return the aircraft to service with the minimum amount of work.

The CAA believes that the main objective of the rule is to allow it to assess the standard to which operators are maintaining their aircraft. The CAA believes that this objective will be achieved and safety will be enhanced by the rule. The rule has now been amended so that it is only effective when discrepancies are not rectified following an inspection. It is not expected that this provision will be used frequently as the majority of operators adequately maintain their aircraft and are comfortable to accept the advice of their maintenance contractor as to the work required to maintain their aircraft.

2.19.5 One commenter suggested that the certificate of Non Release should be optional.

CAA response: The CAA does not consider that it is practical to make this an optional provision.

2.19.6 *One commenter considered that it was not practicable to make this statement in the log book because;*

- *It would upset the owner*
- *It would affect resale of the aircraft*
- *It is effectively saying that the aircraft is unairworthy*
- *The defect would need to be repaired*

CAA response: The CAA agrees that it is possible that all of these things may occur. It is essential that any deficiencies are identified and rectified, if they are not rectified then clearly the aircraft is unairworthy. The CAA would not expect operators to become upset when a deficiency affecting the safe operation of their aircraft is identified. Provided the deficiency is rectified this should have no bearing on the resale value of the aircraft. The CAA believes that subject to the amendment to confine the applicability to required inspections the rule should be retained.

2.20 43.111 Flight Manual Data

As discussed under paragraph 2.18.6 this new requirement has been drafted using the content of rule 43.103(d) of the NPRM.

2.21. 43.113 Duplicate Inspection of Controls

This rule is introduced as discussed in the General Comments section to preserve the present requirements of Section F.16 of New Zealand Civil Airworthiness Requirements.

2.22 43.115 Ground Running Checks-Reciprocating Engines

This rule was previously numbered 43.107.

2.22.1 *One commenter considered that the parameters for ground runs were ill defined and possibly inappropriate. It was considered that, for instance, the recording of cylinder leak down checks would be more meaningful.*

2.22.2 *One commenter considered the rule was unnecessary as the provision for recording these parameters was already in 43.75(a)(4)*

CAA response: The CAA notes that the parameters used are those used in the FAR. They are general parameters which are considered to cover a broad range of engines and provide the essential parameters necessary for safe engine operation. The parameters also reflect the requirements of the design standards

for reciprocating engine powered aircraft and address only those instruments which are required to be fitted. Some engine and aircraft manufacturers provide instrumentation to measure other parameters and of course these should be noted when carrying out ground runs as they provide additional indications as to the condition of the engine.

Cylinder leak down checks are normally a part of the inspection programme not a part of the ground run schedule. The results should be recorded as required by 43.75(a)(4). Although it is a requirement of 43.75(a)(4) to record the results of all measurements obtained during maintenance, The CAA considered it necessary to make a specific rule relating to ground runs carried out as part of a required inspection.

The rule has been amended so that rather than requiring the certifying person to carry out the ground run they are now required to ensure that the run is carried out.

2.22.3 One commenter proposed that the term "magneto" should be replaced with the term "ignition system" to provide a broader application and to allow for technology changes.

CAA response: The CAA agrees with this proposal and the rule has been amended accordingly.

2.22.4 One commenter considered that, in order to make data recorded during ground runs meaningful, it is necessary to also record the ambient atmospheric conditions.

CAA response: The CAA agrees and the rule has been amended.

2.23 43.117 Ground Running Checks Turbine Engines

2.23.1 One commenter considered that it is necessary to make provision for the data to be recorded in some other acceptable form of record, not solely the log book.

CAA response: The CAA agrees and, as in other rules requiring maintenance of records, provision has been made for other acceptable forms of records to be used.

2.24 43.119 Technical Log

This rule was previously numbered 43.111.

2.24.1 Three commenters asked that the requirements for the technical log be developed and published.

2.24.2 Three commenters considered that it was important to develop a suitable and practical flight or technical log and made suggestions as to what its format should be.

2.24. One commenter requested that the technical log should be a compact and simple document.

CAA response: The CAA agrees that it is important that the requirements for the technical log should be known. An informal draft of Part 91 General Operating and Flight Rules has been issued containing the requirement for an operator to provide a technical log for each aircraft. The required contents of the technical log are included in Part 91 and will be consulted in the Docket for Part 91. In the meantime the technical log is being introduced as an amendment to NZCAR F.6. An explanation and draft of the proposed technical log content will be placed in Advisory Circular 43. In setting the requirements the commenters suggestions have been taken into account.

2.24.4 One commenter suggested that the rule was unnecessary as the provisions were covered by 43.75 and 43.103.

2.24.5 One commenter considered that rule was ambiguous and that it inferred that entries in the technical log can only be cleared away from base.

CAA response: There is no provision, in the rules quoted, for the recording of maintenance other than in the logbook. It is intended that the technical log, as well as making provision for the entry and clearance of defects when the aircraft is away from base, will replace the present maintenance release in recording the aircraft's maintenance status. The technical log is not intended to be used when the log book is available. Any deferred maintenance would be transferred into the logbook once the aircraft returned to base. There would be no occasion to clear entries in the technical log when the aircraft was at base.

2.24.6 One commenter considered that the certificate of maintenance review should be entered in the logbook and not in the technical log.

CAA response: The CAA intended, by requiring the certificate to be in the technical log, to provide that essential information to the operator and pilot, who may not have the logbook. However the CAA agrees that the certificate need only be given in the logbook and provision will be made for the certifying engineer to record the accomplishment of the annual review of maintenance in the technical log.

2.25 43.151 Persons to Perform Review

2.25.1 One commenter asked how the "independence" of the Authorised Inspector could be assured.

CAA response: The “independence” of the Authorised Inspector is achieved by ensuring that they fully understand their functions and responsibilities. Persons holding Inspection Authorisations will be senior experienced licensed aircraft maintenance engineers. They will be required to undergo a course of training which will ensure that they fully understand the specific responsibilities of the Inspection Authorisation. The Authorised Inspector is effectively carrying out an audit of the maintenance practices of the aircraft operator.

2.25.2 One commenter asked if an aircraft would be required to go to a second maintenance facility to have its annual review of maintenance.

2.25.3 One commenter considered that requiring the additional annual review would increase the cost of maintenance to the operator.

It is not necessary for the Authorised Inspector to be in a separate facility from that carrying out the maintenance. The person carrying out the maintenance and the person carrying out the annual review may be one and the same. Authorised Inspectors must be clear that they are performing an independent function when certifying the annual review of maintenance. The performance of Authorised Inspectors will be monitored by the CAA both through the operator audit programme and through spot checks of both aircraft documents, and companies and individuals offering maintenance services. Where an Authorised inspector is found to be not performing to the expected standard the Director has the power to suspend or revoke the authorisation.

The CAA considers that overall the cost of maintenance will be reduced. Once a person is granted an Inspection Authorisation there will be little additional cost to maintain it. There may be some additional cost to the operator in having the review carried out but this will be offset by the removal of certification and audit costs to the maintenance facility which should reduce its overhead.

2.25.4 One commenter considered that the annual review of maintenance was unnecessary and that a periodic CAA audit was all that is necessary to ensure standards are maintained.

CAA response: One of the objectives of the new rules and particularly of Part 43 is to reduce the CAA’s day to day intervention in the industry’s activities. One way to do this is to allow the industry to do more of the things that the CAA does at present.

In the past the CAA provided a quality control system for the aviation industry by carrying out inspections of aircraft, facilities and documents. One of the things which the CAA did was to carry out inspections for the renewal of Certificates of Airworthiness. At one time the certificates were renewed annually, later at two and four yearly intervals and now not at all as the Certificate of Airworthiness is generally non terminating.

The CAA has noted, when spot checks are carried out, that the general conformity of aircraft to type certificate standards has declined and this is considered to be as a result of this reduction in CAA activity. In order to reverse this situation it is considered essential that the conformity of aircraft is assessed at regular intervals. The CAA believes that the introduction of the annual review of maintenance, to be carried out by an authorised inspector, is the best means to achieve these objectives.

2.25.5 One commenter asked if the annual review of maintenance will apply to other than standard category aircraft for example restricted category or experimental.

2.25.6 One commenter asked whether the rule would apply to aircraft used on air transport operations.

CAA response: The annual review of maintenance will apply to other airworthiness certificate categories if the certificate is issued for a period longer than twelve months.

The annual review of maintenance will apply to air transport aircraft of not more than 5700kg or certificated for not more than nine passenger seats. Aircraft above this weight or seating capacity will have to comply with a similar requirement under Part 135 or Part 121. The content and periodicity of this review will be agreed as part of the approval of the operator's exposition and will be dependant on the type of aircraft and operation.

2.25.7 One commenter considered that while the CAA was proposing to shift more responsibility to the individual, the requirement for an annual review seems to suggest that this is not so.

CAA response: The person performing the annual review will be an "individual" Licensed Aircraft Maintenance Engineer, but with the "added value" of being trained and qualified as an authorised inspector. It is still considered essential that an independent review be carried out to provide a measure of quality assurance. The CAA is placing this quality assurance function back with the industry, thus giving it responsibility for some of the tasks presently carried out by the CAA.

2.26 43.153 Persons to Perform Review

2.26.1 One commenter considered that the lead in paragraph in this rule did not read well and the language could be improved.

CAA response: The CAA agrees and the paragraph has been amended.

2.26. One commenter considered that the rule could be taken to intend that rectification need only take place annually.

CAA response: Under the present regulations, and in future under Part 91, the aircraft operator is responsible for ensuring that an aircraft is maintained in an airworthy condition. Part 91 will require that all inspections are carried out and that between inspections any discrepancies are rectified.

2.26.3 *One commenter proposed that the first word in 43.153(2) should be "all" rather than "any".*

CAA response: The CAA agrees and the rule has been amended.

2.27 43.155 Certifying Review

2.27.1 *One commenter considered that it was unnecessary for the annual review of maintenance to be recorded in the aircraft technical log.*

2.27.2 *One commenter considered that the Review statement should contain similar wording to that found at the end of US manufacturer's maintenance schedules relating to general rule compliance.*

CAA response: The CAA considers that it essential that the operator or pilot should have the information relating to the date of next maintenance review available each time the aircraft is flown. This is presently provided in the maintenance release but in future will be in the technical log. The wording of the rule has been amended so that the certifying engineer completing the annual review is required to enter the date of the reviews in the technical log rather than recertifying. The technical log will make provision for this entry.

The CAA considers that the review statement is adequate to ensure compliance with the intent of the rule.

2.28 43.157 Certifying Record

The Civil Aviation Authority has determined that this rule would be more appropriately placed in Part 65. Rule 43.157 has therefore been deleted from this part.

2.29 Appendix B Aircraft Radio Station Inspection

2.29 1 *One commenter made a number of comments about the content of this Appendix.*

- (a) *The inspection does not address operation of the VHF, HF and ADF equipment.*
- (b) *Cellphones and GPS systems need to be addressed.*
- (c) *Add a requirement for checking aircraft bonding, and static wicks.*

(d) *Add a requirement for checking antenna mounts for corrosion.*

2.29.2 One commenter proposed that the inspection should include testing ADF operation.

CAA response: Appendix B is only applicable to aircraft being use on IFR operations. The inspections and tests are additional to those required by Appendix C and specifically require the use of an approved test set. All aircraft radio station equipment, whether used for IFR or VFR operations, is required to be inspected under Appendix C each 100 hours or annually. This includes checking all installed equipment for correct operation and includes cellphones and GPS equipment if these are part of the aircraft radio station.

Appendix C, subparagraph (c)(8), addresses the inspection of all installed radio equipment. It contains reference to checking equipment for bonding, for inspecting antenna for condition and corrosion. Static discharge wicks are not specifically mentioned but the wings and empennage must be inspected for general condition of all components. If using the manufacturer's maintenance manual and schedule this will certainly refer to static wicks where fitted.

2.29.3 *One commenter suggested that there should be an overall check of avionic systems, including the transponder and ELT systems.*

CAA response: Whereas the Appendices B and D requirements only apply to IFR operations Appendix E applies to all aircraft operating in transponder mandatory airspace. Appendix F applies to most aircraft under all operating conditions. Therefore it is not possible to combine the appendices and still achieve different applicability.

2.30 Appendix C-Annual and 100 Hour Inspection

2.30.1 *One commenter considered that Appendix C should only be considered when the aircraft manufacturer does not provide a suitable maintenance programme.*

2.30.2 *One commenter considered that it should be emphasised that the standard in Appendix C is the minimum acceptable and that the wording of the first paragraph suggests that this is what must be done.*

CAA response: The CAA agrees. This is already a provision of Section F.6 of New Zealand Civil Airworthiness Requirements and will be transferred into Part 91. Appendix C only provides the minimum items which must be checked when completing a 100 hour or annual inspection. The wording of the first paragraph has been amended to state that this is the minimum requirement to meet 43.61 and does not preclude a higher standard being applied.

Most manufacturers' recommended maintenance programmes meet and exceed this requirement. It is intended that the maintenance programme which is nominated for the aircraft at airworthiness certificate issue will be entered into the technical log for the aircraft.

2.30.3 One commenter was concerned at the use of negative terms in the inspection requirements. For instance "batteries for improper installation" or "instruments for poor condition".

CAA response: When carrying out an inspection, the inspector is looking for things which are incorrect or defective. The schedule naturally requires the inspector to look for "oil leaks", "cracks" "distortion" or "deterioration". The Appendix is consistent in using this form of terminology. The attention of the inspector is being drawn to what are the undesirable conditions which he must look for. This terminology is consistent with the wording in the relevant Appendix in FAR Part 43, and the CAA considers that it is appropriate for Part 43.

2.31 Appendix D Altimeter Tests and Inspections

2.31.1 One commenter considered that the pitot system was as important as the static system and should also have regular checks.

CAA response: The altimeter is considered to be the most critical item of equipment in an IFR aircraft, in terms of the effect on other airspace users if it is misreading. The pitot system should be checked for leaks following any work on the system or following any pilot reported Air Speed Indicator problem. This is an industry standard practice and will be referenced in Advisory Circular 43

2.31.2 One commenter considered that the system leak check parameters applied to unpressurised aircraft were too severe and that many unpressurised aircraft would be unable to meet them.

CAA response: The parameters of paragraph (a) are identical to those provided in FAR Part 43 and those contained in FAA AC43-13-1A which is considered to be an acceptable industry standard practice. Airways Corporation has written to the CAA with regard to misreading transponders suggesting that maintenance practices may need review. The CAA considers that these parameters are appropriate and that it essential that all aircraft, but particularly those which are fitted with encoding altimeters, meet these static system leak down requirements.

2.31.3 One commenter considered that the altimeter calibration parameters were too severe.

CAA response: The test parameters which are provided in paragraph (b) are not intended to be achieved when the instrument is installed in the aircraft. These are design specifications which can normally only be achieved on the test bench. Again these are considered to be appropriate criteria and altimeters which fail to achieve them are no longer meeting the requirements under which they were certificated. Part 91 will require this test to be carried out by an appropriately rated Part 145 organisation.

2.31.4 *One commenter suggested that it would be necessary to carry out wind tunnel tests to meet the requirements of paragraph (a)(4) in respect of airflow disturbance.*

CAA response: The CAA considers that this requirement intends to make the inspector aware that any changes to the static port or to the surrounding structure may cause airflow disturbance and thus incorrect readings. Changes could be caused by damage repairs to the skin or localised deformation of the structure changing the relationship of the static port to the airflow. It is not considered necessary to carry out in depth investigation of the airflow.

2.31.5 *One commenter considered that paragraph (c)(Integration Test) of the inspection requirements should be transferred to Appendix E Transponder Inspections.*

CAA response: The Automatic Pressure Altitude Reporting Equipment and ATC Transponder System Integration Test is required to be carried out under two different sets of circumstances. The test is carried out routinely each twelve months, together with the rest of the requirements of the Appendix. It is also carried out following installation or maintenance on the automatic pressure altitude reporting system of the ATC transponder, where data correspondence error could be introduced.

The CAA expects that the biennial inspection of the altimeter system and the transponder system would occur at the same time. The requirements of Appendix D and E would then be accomplished together. The placing of the integration test in Appendix D follows the arrangement in the appropriate appendix to FAR Part 43 and the CAA considers that this remains appropriate for New Zealand.

2.32 Appendix E Transponder Tests and Inspections

2.32.1 *One commenter stated that the Appendix was rubbish and not appropriate to New Zealand aircraft.*

CAA response: Both Mode A and C, and Mode S transponders are fitted to New Zealand aircraft although only Mode A and C is used within New Zealand. The Appendix provides the testing requirement for all Modes and it is clear that the Mode S requirements are not applicable to the majority of aircraft which

operate only within New Zealand. This does not detract from the validity of the information provided. The various sections of the Appendix should be used for testing the equipment to which they apply. The CAA considers that when applied as intended the Appendix is appropriate for use in maintaining New Zealand aircraft.

2.32.2 *One commenter asked for clarification of what facility was required to carry out the Appendix E Tests and Inspections.*

CAA response: Part 91 will require that the inspections and tests are carried out by a Part 145 certificated organisation with an appropriate rating.

2.32.3 *One commenter considered that the Transponder Test could be carried out by ATC and certified in the aircraft log book by the pilot. Verification could be gained through the ATC traffic log.*

CAA response: The CAA considers that this proposal has some merit but would want more detailed proposals. While the fact that at a given time ATC obtained the required signal and signal strength from the transponder this only verifies the transponder performance under the particular conditions at that time. The transponder test and inspection assesses the transponder performance against its design specification and gives an assurance that it will be effective at all times and under all conditions. The CAA will publish a discussion document at a later stage to assess opinion on the issue.

2.32.4 *One commenter suggested that the altitude encoder and system should be included in this Appendix.*

CAA response: The testing of the altitude encoding system is included in Appendix D and the reasoning behind this is given in subparagraph 2.31.5.

2.32.5 *Airways Corporation commented, not directly in response to this NPRM but against NZCAR F6 which has the same inspection requirement, that the alternative means of checking receiver sensitivity given in paragraph (c)(1)(ii) is inappropriate. The Corporation considers that this method of testing fails to reveal poor connections between transmission cable and antenna. Thus while the transponder gives every indication of operating satisfactorily transmission failure occurs as a result of the poor connection. The Corporation considers that the only reliable means of verifying transponder system operation is with a test set connected to the antenna end of the transmission line.*

CAA response: The inspection option provide by subparagraph (c)(1)(ii) is one provided in the FAR Part 43 schedule. The CAA considers that in the short term it should remain in the schedule, but a discussion document will be circulated at a later date.

2.33 Appendix F Emergency Location Beacon Inspections and Tests

2.33.1 *Two commenters considered that the inspection period for ELB's should be changed to two yearly to align with other avionics equipment such as the radio station, altimeters and transponders.*

CAA response: The period for inspection of ELB's is set in Section F.6 of New Zealand Civil Airworthiness Requirements. This requirement will be transferred to Part 91 which is presently being drafted. The issue of the periodicity of this check will be consulted in Part 91.