Description of the General Directions *Examination Procedures*

This proposed General Direction (GD), *Examination Procedures*, is an updated revision of the published 2009 GD of the same name. Changes from the 2009 GD are:

- Re-arranging the various sections in a more logical order;
- Minor wording changes throughout the document for clarification;
- Changes to Part 1 with introduction of the Augmented Medical History in lieu of a GME in specific cases approved by the Director;
- Changes to cross references in Part 1, especially to other GDs that remove the date of the referenced GD and replace this with 'current'. This change is intended to have no effect other than reduce the workload required when other GDs are revised.
- Insertion of a 'proof of identity' provision in Part 1, and removal of the many similar provisions throughout the rest of the document. Again, this is intended simply to reduce the complexity of the document, ensure internal consistency, and make updates and revisions less labour intensive.
- Changes to Section 3 of Schedule 1

  Removal of 'specialist medical physician' and insertion of direct reference to expertise domain required.

  Inserting a reference listing 'normal variant' ECG diagnoses (Schedule 1, Section 3) that do not necessarily require cardiologist reporting.
- Changes to Section 4 of Schedule 1

  Clarification of excessive CVS risk interpretation parameters.

  Adjusting the period of validity for cardiovascular risk estimation.
- Updating of the CVS risk-assessment tool specification and inclusion of a degree of future-proofing into that section.
- Changes to Section 8 of Schedule 1 (now rearranged as Section 6)

  Incorporate HbA1c assay as a legitimate alternative test

  Remove the need to undertake a test while fasting.
- Changes to section 8 of schedule (now rearranged as Section 6) to incorporate the option of point of care testing (POC testing).
- Updating of Sections 11-17 of Schedule 1, to incorporate the Colour Vision Deficiency General Directions Notice
- Insertion of Exercise Stress Electrocardiography section into Schedule 4.
- Insertion of Calcium scoring section into Schedule 4.

Other material

No other material is included in this consultation bundle.

Civil Aviation (Examination Procedures)
General Directions Notice 2020

Pursuant to section 27G of the Civil Aviation Act 1990, the Director, after having consulted the persons, health professionals with aviation medical experience, representative groups within the aviation industry or elsewhere, government departments, and Crown agencies that the Director considers appropriate, gives the following notice.

Contents

Notice

1 Title

This notice is the Civil Aviation (Examination Procedures) General Directions Notice 2020.

2 Commencement

This notice comes into force on **01 February 2021**

Part 1
Purpose and interpretation

3 Purpose

The purpose of this notice is —

(a) to provide for the conduct of examinations of applicants and licence holders, and the reporting of the results of those examinations to the Director; and

(b) to specify the requirements (if any) of examinations or other clinical matters, including-

(i) the medical content of examinations:

(ii) the interpretation and analysis of results of examinations:

(iii) the significance of results of examinations for the purpose of determining whether or not an applicant is eligible for a medical certificate under section 27B of the Act.

4 Interpretation

(1) In this notice, unless the context otherwise requires,—

Act means the Civil Aviation Act 1990

AS/NZS 1269.4 means the current Joint Australian and New Zealand Standard on Occupational noise management – Auditory assessment

Director means the Director of the NZ CAA

ISO 8253 means the current International Organization for Standardization Standard on Acoustics-Audiometric test methods

non-routine examinations means the examinations that an applicant for a class of medical certificate may be required to undertake in addition to any routine examinations;

other applicable routine examinations has the same meaning as in clause 4(1) of the current Civil Aviation (Timetable of Routine Examinations) General Directions Notice

routine examinations has the same meaning as in clause 4(1) of the current Civil Aviation (Timetable of Routine Examinations) General Directions Notice

Rules means the Civil Aviation Rules.

(2) A term or expression that is defined in the Act or the Rules and used, but not defined, in this notice has the same meaning as in the Act or the Rules, as the case may require.

5 Applicant proof of identity

(1) For the purpose of the routine examinations and non-routine examinations described by these General Directions, and where an applicant is required to produce evidence of his or her identity, the following documents are acceptable for that purpose:

(a) a current New Zealand passport;

(b) a current New Zealand driver licence;

(c) a current New Zealand airport identity card.

(2) An equivalent form of photographic identification (e.g. a passport or licence from another State, a photographic credit card, or a firearms licence).

6 Status of examples

(1) An example used in this notice is only illustrative of the provision to which it relates. It does not limit the provision.

(2) If an example and the provision to which it relates are inconsistent, the provision prevails.

Part 2
Examination procedures

7 Routine examinations

Schedule 1 sets out the requirements of the Rules for each of the routine examinations contained in that schedule.

8 Non-routine examinations

Schedules 2 to 13 set out the requirements of the Rules for the non-routine examinations to which each of those schedules applies.

Schedule 1 Routine examinations

Section 1: General medical examination

1.1 Definition

A general medical examination (GME) means the general medical examination referred to in rule 67.57(l)(i) of the Rules.

1.2 Conduct of examination

1.2.1 A general medical examination consists of the following examinations:

(a) a clinical examination; and

(b) any applicable routine examination that may be required in accordance with the current Civil Aviation (Timetable of Routine Examinations) General Directions Notice; and

(c) any non-routine examination that may be clinically indicated.

1.2.2 Alternative examination procedures may be approved in exceptional circumstances, provided that:

(a) The Director gives specific case by case approval for such alternative procedures; and

(b) The Director specifies what alternative procedures are acceptable.

1.2.3 Applicable routine and non-routine examinations may be conducted by the personnel specified in the relevant requirements set out in any General Directions.

1.2.4 If clause 1.2.3 does not apply, applicable routine and non-routine examinations may be conducted by a person who is suitably qualified and experienced and who is acceptable and authorised by the Director.

1.3 Interpretation of results

The results of a general medical examination must be interpreted in accordance with Rules Part 67, any General Directions, the guidance contained in the Medical Manual and best medical practice that applies in New Zealand.

1.4 Reporting requirements

A Medical Examiner must ensure that the results of each examination that constitute a general medical examination are —

(a) recorded and reported in accordance with any applicable General Directions; and

(b) included with the report made under section 27D(1) of the Act; or

(c) included in an electronic version of that report, approved by the Director.

1.5 Period of validity of results

The period of validity for each examination shall be as detailed in these General Directions.

Section 2: Clinical examination

2.1 Definition

Clinical examination means the physical and mental medical examination of an applicant by a Medical Examiner.

2.2 Conduct of examination

2.2.1 An applicant who must have a clinical examination must produce evidence of their identity as outlined in Part 1, paragraph 5 (Applicant proof of identity) of these General Directions.

2.2.2 A clinical examination of an applicant must-

(a) record the applicant's history on the basis of information provided by the applicant; and

(b) include a general medical examination of the applicant, including height, weight, pulse, and sitting blood pressure.

(c) include an examination of all the applicant's systems, including —

(i) an examination of the eyes, including distant vision (using 6m charts), intermediate vision when applicable and near vision, without correction, with primary correction, and with standby correction; and

(ii) an examination of visual (fields by confrontation), eye movements, and cover tests; and

(iii) an examination of ears, nose, and throat, and the conducting of a conversational voice test; and

(iv) a general psychiatric screening; and

(v) an examination of the applicant's speech (any element of dysarthria to be documented); and

(vi) documentation of derived parameters (for example, body mass index or cardiovascular risk estimation); and

(vii) any other examinations that may be clinically indicated by the applicant's history or the results of other examinations.

2.3 Interpretation of results

The results of a clinical examination must be interpreted in accordance with the Rules Part 67, any General Directions, the guidance contained in the Medical Manual and best medical practice that applies in New Zealand.

2.4 Reporting requirements

2.4.1 The results of a clinical examination must be documented on the report made under section 27D(l) of the Act (using the current version of CAA form 24067/002 or an electronic version of that form), which must be signed and dated by the Medical Examiner.

2.4.2 If an applicant has any history, symptoms, or signs of any conditions, the appropriate CAA reporting forms must be used. The forms must be signed and dated by the Medical Examiner. The forms that must be used include the following:

- (a) for respiratory conditions, the *Respiratory Examination Report*
- (b) for headaches, the *Headache Investigation Report*
- (c) for hypertension, the *Blood Pressure Examination Report*
- (d) for diabetes mellitus, the *Diabetes Report*
- (e) for applicants older than 70 years, the *Aging Pilot Report*

2.4.3 The document produced by an applicant as evidence of his or her identity must be recorded on the report that under section 27D(l) of the Act (form CAA 24067/002 or an electronic version of that form), records the results of the clinical examination.

2.5 Period of validity of results

The results of a clinical examination are valid for a period of 90 days from the date of the examination, unless otherwise specified in this General Direction.

Section 3: Alternative method to the clinical medical examination

3.1 Definition

Means an alternative method of determining the physical and mental medical condition of an applicant as described in schedule 1 – para 1.2.2 of these General Directions.

3.2 Conduct of the examination

The alternative method must follow any protocol provided case by case by the Director.

3.3 Interpretation of results

The results of the alternative method of examination must be interpreted in accordance with the Rules in Part 67, any General Directions, the guidance contained in the Medical Manual and best medical practice that applies in New Zealand.

3.4 Reporting requirements

The results of an alternative method to the clinical examination must be documented on the report made under section 27D(l) of the Act or an electronic version of that report. The documents must be signed and dated by the Medical Examiner.

3.5 Period of validity of results

The results of an alternative method to a clinical medical examination are valid for a period of 90 days from the date of the examination.

Section 4: 12-1ead ECG

4.1 Definition

12-1ead ECG means a 12-lead electrocardiogram that uses standard techniques to record the electrical activity of an applicant's heart.

4.2 Conduct of examination

An electrocardiogram (ECG) trace must be conducted as follows:

(a) the sensitivity must be set at 10 mm/mV:

(b) the recording speed must be set at 25 mm/s:

(c) the baseline calibration must be shown:

(d) the trace must be displayed in the following order:

Types	Leads required
Bipolar leads	I, II, and III
Unipolar leads	aVR, aVL, and aVF
Precordial leads	V1-6
Rhythm strip	II

4.3 Interpretation of results

4.3.1 Interpretation of a 12-lead ECG may be conducted by a self-reporting ECG machine.

4.3.2 The results of a 12-lead ECG must be interpreted and reported by a cardiologist, or other suitable medical specialist acceptable to the Director[1], if:

(a) The machine-generated report is not normal; or

(b) There is no machine-generated report;

4.3.3 Notwithstanding 4.3.2(a), a 12-lead ECG may be interpreted as normal if the machine-generated report relates to a normal variant acceptable to the Director, and the Medical Examiner is satisfied that the ECG tracing is a normal variant of no aeromedical significance.

4.3.4 The machine-generated ECG findings that are acceptable to the Director as a normal variant are described in the current Medical Manual, Cardiovascular System chapter.

4.4 Reporting requirements

The report made under section 27D(I) of the Act (form CAA 24067/002, or an electronic version of the form) must

(a) include, if applicable, the machine-generated report; and

(b) include, if applicable, the report of the cardiologist or other suitable medical specialist acceptable to the Director[1] who interpreted the results of the 12-lead ECG; and

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[1] The intention of this provision is for non-normal ECGs to be interpreted by specialist medical practitioners with domain expertise in the reading and interpretation of electrocardiograms. If a cardiologist is not available another specialist physician may be an acceptable alternative and the suitability of a particular practitioner should be discussed with the CAA. This might reasonably include some, but not necessarily all, general physicians, internal medicine specialists, anaesthetists, emergency medicine specialists, and critical care / intensive care specialists.

(c) include, if applicable, the report of the Medical Examiner confirming that the 'normal variant' requirements, described in the Medical Manual have been met; and

(d) include the ECG tracing, which, —

(i) if a single-channel recorder is used, must be cut, mounted, and labelled on the report made under section 27D(l) of the Act (form CAA *24067/002);* and

(ii) if a multi-channel recorder is used, must be presented in an A4 format; and

(e) be signed and dated by the Medical Examiner

4.5 Period of validity of results

The results of a 12-1ead ECG are valid for a period of 12 months from the date of the examination.

Section 5: Cardiovascular risk estimation

5.1 Definition

Cardiovascular risk estimation, in relation to an applicant, means the calculation of the applicant's 5-year risk of a cardiovascular event based on medical information.

5.2 Conduct of examination

5.2.1 The 5 year risk must be calculated using the PREDICT-CV risk assessment tool described in the NZ Ministry of Health "Cardiovascular Disease Risk Assessment and Management for Primary Care" published by the NZ Ministry of Health (2018) ISBN 978-1-98-853933-1 (online) HP6747 – or later, or other similar risk assessment tools approved by the Director.

5.2.2 For the purposes of cardiovascular risk estimation, —

(a) the most recent HbA1c and blood lipids estimations, as required under the current Timetable of Routine Examinations General Directions Notice must be used:

(b) a smoker means someone who has smoked tobacco in the last 12 months:

(c) an applicant aged above the age range covered by the cardiovascular risk assessment tool specified in section 5.2.1 is to be considered as having a 5-year risk of greater than 10%.

5.3 Interpretation of results

A 5-year risk of 10% or more must be interpreted as being of aeromedical significance unless the presence of ischaemic heart disease has been excluded.

5.4 Reporting requirements

5.4.1 The results of the cardiovascular risk estimation referred to in section 5.3 must clearly indicate:

(a) the percentage risk range or number over 5 years; and

(b) the values of all the risk factors that were utilised in the calculation.

5.4.2 The results of the cardiovascular risk estimation must be reported in and attached as a printed document to the Medical Examiner's report made under section 27D(1) of the Act (form CAA 24067/002, or an electronic version of the form).

5.5 Period of validity of results

The results of cardiovascular risk estimation are valid until next required under the Timetable of Routine Examinations General Directions Notice unless required earlier for clinical reasons.

Section 6: Blood lipids estimation

6.1 Definition

Blood lipids estimation means the estimation of serum lipids carried out on a sample of blood.

6.2 Conduct of examination

A sample of blood must be used for lipids estimation.

The blood sample must be analysed by:

(a) An accredited laboratory; or

(b) A Point of Care (POC) analyser, if approved by the Director

6.3 Interpretation of results

The results of blood lipids estimation must be interpreted in accordance with the current version of the Cardiovascular Disease Risk Assessment and Management for Primary Care document published by the NZ Ministry of Health.

6.4 Reporting requirements

The laboratory or POC printed reports must be attached to the examination report made under section 27D(l) of the Act (form CAA 24067/002, or an electronic version of the form).

6.5 Period of validity of results

For the purpose of cardiovascular risk estimation, the results of blood lipids estimation are valid for a period of 12 months from the date of the examination.

Section 7: Blood sugar estimation

7.1 Definition

Blood glucose estimation means the estimation of an HbA1c carried out on a blood sample or alternatively a glucose estimation carried out on a fasting sample of blood where an HbA1c is not practicable.

7.2 Conduct of examination

A sample of blood must be used for glucose estimation. The blood sample must be analysed by:

(a) An accredited laboratory; or

(b) A POC analyser, if approved by the Director;

7.3 Interpretation of results

The results of blood glucose estimation must be interpreted in accordance with the current version of the Cardiovascular Disease Risk Assessment and Management for Primary Care document published by the NZ Ministry of Health.

7.4 Reporting requirements

The laboratory or POC printed reports must be attached to the examination report made under section 27D(l) of the Act (form CAA 24067/002 or an electronic version of that form).

7.5 Period of validity of results

For the purpose of cardiovascular risk estimation, the results of blood glucose estimation are valid for a period of 12 months from the date of the examination.

Section 8: Chest X-ray

8.1 Definition

Chest X-ray means a radiographic examination of the lungs, heart, and other tissues and organs of the chest and upper abdomen.

8.2 Conduct of examination

8.2.1 An applicant who must have a chest X-ray must produce evidence of their identity as outlined in Part 1, paragraph 5 (Applicant proof of identity) of these General Directions.

8.2.2 A chest X-ray must be conducted by a suitably qualified and experienced radiography technician, radiologist, or other medical practitioner using standard published methodologies.

8.2.3 The chest X-ray required is a postero-anterior view in full inspiration.

8.3 Interpretation of results

A chest X-ray must be interpreted by a qualified radiologist.

8.4 Reporting requirements

8.4.1 The report of the chest X-ray must identify the facility used and the reporting radiologist.

8.4.2 The report format used by the reporting radiologist is acceptable.

8.4.3 The report of the chest X-ray, but not the X-ray plates, must be included in or accompany the report made under section 27D(l) of the Act (form CAA24067/002 or an electronic version of the form).

8.4.4 The document produced by an applicant as evidence of his or her identity must be recorded on the report made under section 27D(1) of the Act recording the results of the chest X-ray.

8.5 Period of validity of results

The results of a chest X-ray are valid for a period of 12 months from the date of the examination.

Section 9: Spirometry

9.1 Definition

Spirometry means the examination and measurement of breathing performance and lung volume.

9.2 Conduct of examination

9.2.1 An applicant who must have spirometry must produce evidence of their identity as outlined in Part 1, paragraph 5 (Applicant proof of identity) of these General Directions.

9.2.2 Spirometry is to be performed —

(a) in the manner described by the manufacturer of the spirometer; or

(b) in accordance with published procedures or codes of practice acceptable to the Director.

9.2.3 Spirometry must include the following measurements:

(a) FVC (forced vital capacity):

(b) FEV_1 (forced expired volume in 1 second):

(c) FEV_1/VC, which is the FEV_1 expressed as the percentage of the VC or FVC (whichever volume is larger):

(d) PEF (peak expiratory flow):

(e) FEF25-75% (average expired flow over the middle half of the FVC manoeuvre) is to be recorded if available

(f) a spirogram or a flow volume graph.

9.2.4 If there is a history of respiratory disease, or if the FEV1 is less than 80% of predicted, the readings must be repeated after a bronchodilator.

9.2.5 All indices of ventilatory function should be reported at body temperature and pressure saturated with water vapour (BTPS).

9.3 Interpretation of results

If there is no history of respiratory disease and all parameters are within the published normal range for the applicant's biological characteristics, the spirometry results may be interpreted as not being of aeromedical significance.

9.4 Reporting requirements

9.4.1 The report made under section 27D(I) of the Act (form CAA 24067/002, or an electronic version of the form) must-

(a) be conducted using an appropriately calibrated device;

(b) include the measurements referred to in section 9.2.3 reported as a table. This must also include the predicted values and the percentage of the predicted values; and

(c) state whether the results of spirometry are normal, or show some degree of restriction or obstruction; and

(d) include either of the following graphic methods:

(i) a maximal expiratory flow-volume curve; or

(ii) (ii) a maximal expiratory spirogram; and

(e) be signed and dated by the person who conducted the examination, if the examination has not been carried out by a Medical Examiner.

9.4.2 The document produced by an applicant as evidence of his or her identity must be recorded on the report that under section 27D(I) of the Act records the results of spirometry.

9.5 Period of validity of results

The results of spirometry are valid for a period of 12 months from the date of the examination.

Section 10: Audiometry

10.1 Definition

Audiometry means the examination of pure-tone air conduction audiometry and may include bone conduction audiometry.

10.2 Conduct of examination

10.2.1 An applicant who must have audiometry must produce evidence of their identity as outlined in Part 1, paragraph 5 (Applicant proof of identity) of these General Directions.

10.2.2 A Medical Examiner must ensure that audiometry is conducted in accordance with —

(a) ISO 8253; or

(b) AS/NZS 1269.4

(c) any other equivalent published standard that is acceptable to the Director.

10.3 Interpretation of results

The results of audiometry may be interpreted as a pass if the hearing deficit measured in either ear is not more than —

(a) 35 dB at any of the frequencies of 500 Hz, 1 000 Hz, or 2 000 Hz; or

(b) 50 dB at the frequency of 3 000 Hz.

A hearing deficit beyond these values may be acceptable if the deficit can be assessed as not being of aeromedical significance under the Medical Manual, Otorhinolaryngology chapter.

10.4 Reporting requirements

10.4.1 The results of audiometry must be reported on the audiometry report (form CAA 24067/203, or an electronic version of the form), unless otherwise approved by the Director.

10.4.2 The document produced by an applicant as evidence of his or her identity must be recorded on the audiometry report.

10.5 Period of validity of results

The results of audiometry are valid for a period of 12 months from the date of the examination.

Section 11: Special vision examination

11.1 Definition

Special vision examination means a comprehensive assessment of vision.

11.2 Conduct of examination

11.2.1 An applicant who must have a special vision examination must produce evidence of their identity as outlined in Part 1, paragraph 5 (Applicant proof of identity) of these General Directions.

11.2.2 The following must be included in the special vision examination:

(a) history of visual problems or occupational exposure;

(b) general eye examination;

(c) examination of distant, intermediate, and near vision without correction;

(d) examination of distant, intermediate (if applicable), and near vision with primary correction (if applicable);

(e) examination of distant, intermediate (if applicable), and near vision with standby correction (if applicable);

(f) examination of visual fields (by confrontation);

(g) examination of eye movements;

(h) examination of ocular muscle balance;

(i) examination to detect and quantify phorias and tropias at distance and near vision;

(j) measurement of intraocular pressures;

(k) dilated fundus examination;

(l) colour-vision screening examination;

(m) any other examinations that may be clinically indicated by the applicant's history or other examinations.

11.3 Interpretation of results

The results of a special vision examination must be interpreted in accordance with current best medical practice that applies in New Zealand and the guidance contained in the Medical Manual, Ophthalmology chapter.

11.4 Reporting requirements

11.4.1 The history and findings of the special vision examination must be documented on the special eye report (form CAA 24067/211, or an electronic version of the form) and stamped, signed and dated by the examining ophthalmologist/CAA-accredited optometrist.

11.4.2 The document produced by an applicant as evidence of his or her identity must be recorded on the report that under section 27D(1) of the Act (form CAA 24067/002 or an electronic version of that form) records the results of the special vision examination.

11.5 Period of validity of results

The results of a special vision examination are valid for a period of 12 months year from the date of the examination.

Section 12: Ishihara Colour-Vision Screening Examination

12.1 Definition

12.1.1 The Colour Vision screening examination (Ishihara) is a screening examination of Colour Vision function.

12.1.2 The Colour Vision screening examination (Ishihara) employs the Ishihara pseudo-isochromatic plate set. A variety of plate sets may be used: 14 or 16 –plate edition; 24 or 26 -plate edition; 32 or 36 or 38 –plate edition. Each plate set comprises:

(a) An introductory numerical plate that both normal and colour defective individuals are able to read;

(b) A number of adult test plates that require the reader to identify a numeral from amongst the differently coloured and sized circles;

(c) A number of plates where the reader is asked to trace a winding line, between two points, from amongst the differently coloured and sized circles.

12.1.3 There are different pass-fail criteria for the different plate sets.

12.2 Conduct of examination – Ishihara

12.2.1 An applicant who undertakes a Colour Vision screening examination (Ishihara) must produce evidence of their identity as outlined in Part 1, paragraph 5 (Applicant proof of identity) of these General Directions.

12.2.2 A Medical Examiner must ensure that the Colour Vision screening examination (Ishihara) is conducted in accordance with —

(a) the manufacturer's instructions for the Ishihara plate set used; or

(b) any other equivalent published standard that is acceptable to the Director.

12.2.3 Unless specified otherwise in the manufacturer's instructions the Medical Examiner must ensure that the Colour Vision screening examination (Ishihara) is conducted—

(a) In daylight conditions or under illuminate D65 conditions (as provided by a Philips 96 fluorescent tube light);

(b) With each plate presented perpendicular to the applicant's line of sight, and at a distance of greater than 75 cm from the applicant's eyes (beyond the applicant's fingertips);

(c) With the plates presented to the applicant in random order.

12.2.4 The Medical Examiner must test the applicant with all of the adult numerical test plates contained within the plate set used.

12.3 Interpretation of results – Ishihara

12.3.1 The results of the Colour Vision screening examination (Ishihara) are interpreted as a pass when:

(a) the applicant makes 1 or less errors on the adult numerical test plates of a 14 or 16 –plate Ishihara plate set.

(b) the applicant makes 2 or less errors on the adult numerical test plates of a 24 or 26 –plate Ishihara plate set.

(c) the applicant makes 3 or less errors on the adult numerical test plates of a 32 or 36 or 38 –plate Ishihara plate set.

Note

For the post-1980 versions of the 24-plate Ishihara test the adult numerical test plates are plates number 2 – 15, and plate number 1 is the introductory or demonstration numerical plate.

12.3.2 Otherwise the results of the Colour Vision screening examination (Ishihara) are interpreted as a fail.

12.3.3 An applicant failing the Ishihara screening test must be assessed in accordance with the Colour Vision Deficiency General Directions Notice.

12.4 Reporting requirements – Ishihara

12.4.1 The Medical Examiner must ensure that any plate numbers that the applicant has identified incorrectly are recorded in the appropriate place in the report required under section 27D of the Act (form CAA 24067/002, or an electronic version of that form).

12.4.2 The document produced by an applicant as evidence of his or her identity must be recorded on the report that under section 27D(1) of the Act records the results of the Colour Vision screening examination (Ishihara).

12.5 Period of validity of results – Ishihara

12.5.1 The results of a Colour Vision screening examination (Ishihara) are valid for a period of 12 months from the date of the examination for the purpose of a first application.

12.5.2 The results of a Colour Vision screening examination (Ishihara) are valid indefinitely once a certificate of the same class has been issued, unless there are reasonable grounds to re-examine the applicant's colour vision.

Section 13: Farnsworth D15 Colour Vision Test

13.1 Farnsworth D15 Colour Vision Test

13.1.1 The Farnsworth D15 Colour Vision Test is an examination of colour nuances discrimination ability.

13.1.2 The Farnsworth D15 is a so-called arrangement test, based on a set of coloured plates or discs which have to be arranged in the correct order. A wrong order shows by having crossings in a diagram representing the coloured discs. The directions of the crossings (confusion lines) give an idea of the type and severity of the Colour Vision deficiency.

13.1.3 A line is drawn from the starting point (Reference disc which is blank on the bottom) through the sequence determined by the patient. If the lines remain along the outside of the circle (few chips out of order) then the patient is deemed to be 'normal' or very mildly colour deficient. If the sequence lines cross the centre, the patient has a medium or strong defect.

13.1.4 The type of defect is determined by comparing these crossover lines to see if they are parallel to the protan, deutan or tritan colour confusion axes. Confusions occurring in a certain direction across the score sheet reveal the type of colour defect.

13.2 Conduct of examination - Farnsworth D15 Colour Vision Test

13.2.1 An applicant who undertakes a Farnsworth D15 Colour Vision test must produce evidence of their identity as outlined in Part 1, paragraph 5 (Applicant proof of identity) of these General Directions.

13.2.2 The Farnsworth D15 colour must be conducted by an accredited optometrist in accordance with:

(a) the manufacturer's instructions for the D15 test; or

(b) any other equivalent published standard that is acceptable to the Director.

13.3 Interpretation of results - Farnsworth D15 Colour Vision Test

13.3.1 An error is recorded in the Farnsworth D15 Colour Vision test if the sequence lines cross the centre. This means that patient has a medium or strong defect.

13.3.2 The results of the Farnsworth D15 Colour Vision test are interpreted as a pass if:

(a) there is no crossing across the diagram; and

(b) there is no more than 2 minor crossings along the periphery of the diagram.

13.3.3 Otherwise the results of Farnsworth D15 test are interpreted as a fail. A fail test result cannot be ignored following a subsequent pass result.

13.4 Reporting requirements - Farnsworth D15 Colour Vision Test

The results of the Farnsworth D15 Colour Vision test must be reported in a manner that clearly indicates whether the subject has a severe or not severe Colour Vision deficiency. The results should also specify the nature and number of any crossing errors made. The D15 graph must be provided.

13.5 Period of validity of results - Farnsworth D15 Colour Vision Test

(a) the results of a Farnsworth D15 Colour Vision test are valid for a period of 12 months

(b) notwithstanding 1.5 (a), the results of a Colour Vision screening examination (D15) are valid for an indefinite period once a certificate has been issued unless there is clinical suggestion that the applicant's Colour Vision deficiency may have changed.

Section 14: Farnsworth Lantern (FALANT) Colour Vision Test

14.1 Farnsworth Lantern (FALANT) Colour Vision Test

14.1.1 The Farnsworth lantern (FALANT) Colour Vision test is an examination of Colour Vision function.

14.1.2 The Farnsworth lantern (FALANT) Colour Vision test is a two-light colour naming test employing red, green, and white lamps. The subject is asked to identify the colour of each of the two lights (using only the colour names "red", "green", and "white") as they are presented.

Note
The use of the Stereo Optical OPTEC 900 lantern is an acceptable alternative to the Farnsworth lantern for the purposes of the Farnsworth lantern (FALANT) Colour Vision test.

14.2 Conduct of examination – Farnsworth Lantern (FALANT) Colour Vision Test

14.2.1 An applicant who undertakes a Farnsworth lantern (FALANT) Colour Vision test must produce evidence of their identity as outlined in Part 1, paragraph 5 (Applicant proof of identity) of these General Directions.

14.2.2 A Medical Examiner must ensure that a Farnsworth lantern (FALANT) Colour Vision test is conducted in accordance with —

(a) the manufacturer's instructions for the Farnsworth lantern (FALANT) Colour Vision test device; or

(b) any other equivalent published standard that is acceptable to the Director.

14.3 Interpretation of results – Farnsworth Lantern (FALANT) Colour Vision Test

14.3.1 An error is recorded in the Farnsworth lantern (FALANT) Colour Vision test if there is a mistake in naming either or both of the colours in the pair that is presented. A second and third run of nine presentation is only required if the subject makes one or

more errors on the initial run. The average error score is the mean of the error scores made during the second and third run of nine presentations.

14.3.2 The results of the Farnsworth lantern (FALANT) Colour Vision test are interpreted as a pass if:

(a) there are no errors during the initial run of nine presentations; or

(b) there are errors during the initial run of nine presentations, and there is an average error score of 1.0 or less during the second and third run of nine presentations.

14.3.3 Otherwise the results of the Farnsworth lantern (FALANT) Colour Vision test are interpreted as a fail. A fail test cannot be ignored following a subsequent pass result.

14.4 Reporting requirements – Farnsworth Lantern (FALANT) Colour Vision Test

The results of the Farnsworth lantern (FALANT) Colour Vision test must be reported in a manner that clearly indicates whether the subject passed or failed the test. The results should also specify the nature and number of any errors made.

14.5 Period of validity of results – Farnworth Lantern (FALANT) Colour Vision Test

The results of a Farnsworth lantern (FALANT) Colour Vision test are valid for an indefinite period unless there is clinical suggestion that the applicant's Colour Vision deficiency may have changed.

Section 15: Anomaloscope (Nagel or Neitz) Colour Vision Test

15.1 Anomaloscope (Nagel or Neitz) Colour Vision Test

15.1.1 The Anomaloscope (Nagel or Neitz) Colour Vision test is an examination of Colour Vision function.

15.1.2 These are colour matching tests that require the subject to adjust the amount of red and green light required to match a static yellow light. Anomaloscopes are the gold standard for diagnosis of protan and deutan Colour Vision deficiencies.

15.2 Conduct of examination – Anomaloscope (Nagel or Neitz) Colour Vision Test

15.2.1 An applicant who undertakes an anomaloscope (Nagel or Neitz) Colour Vision test must produce evidence of their identity as outlined in Part 1, paragraph 5 (Applicant proof of identity) of these General Directions.

15.2.2 A Medical Examiner must ensure that the anomaloscope (Nagel or Neitz) Colour Vision test is conducted in accordance with —

(a) the manufacturer's instructions for the anomaloscope (Nagel or Neitz) Colour Vision test; or

(b) any other equivalent published standard that is acceptable to the Director.

15.3 Interpretation of results – Anomaloscope (Nagel or Neitz) Colour Vision Test

There are no pass or fail criteria for interpretation of the results of an anomaloscope (Nagel or Neitz) Colour Vision test. The results of the anomaloscope (Nagel or Neitz) Colour Vision test are to be interpreted as to the nature (*protan* or *deutan* etc) and severity of the subject's Colour Vision deficiency.

15.4 Reporting requirements – Anomaloscope (Nagel or Neitz) Colour Vision Test

The results of the anomaloscope (Nagel or Neitz) Colour Vision test must be reported in a manner that clearly indicates the severity and nature (e.g. +3 deutan) of the subject's Colour Vision deficiency.

15.5 Period of validity of results – Anomaloscope (Nagel or Neitz) Colour Vision Test

The results of an anomaloscope (Nagel or Neitz) Colour Vision test are valid for an indefinite period unless there is clinical suggestion that the applicant's Colour Vision deficiency may have changed.

Section 16: Holmes-Wright Lantern Colour Vision Test

16.1 Holmes-Wright Lantern Colour Vision Test

16.1.1 The Holmes-Wright lantern Colour Vision test is an examination of Colour Vision function.

16.1.2 The Holmes-Wright lantern Colour Vision test is either a two-light or three-light colour naming test employing red, green, and white lamps. The subject is asked to identify the colour of each of the lights (using only the colour names "red", "green", and "white") as they are presented.

Note

The Holmes-Wright lantern Type A or Type B is acceptable for performance of the Holmes-Wright lantern Colour Vision test.

16.2 Conduct of examination – Holmes-Wright Lantern Colour Vision Test

16.2.1 An applicant who undertakes a Holmes-Wright lantern Colour Vision test must produce evidence of their identity as outlined in Part 1, paragraph 5 (Applicant proof of identity) of these General Directions.

16.2.2 A Medical Examiner must ensure that a Holmes-Wright lantern Colour Vision test is conducted in accordance with —

(a) the manufacturer's instructions for the Holmes-Wright lantern Colour Vision test device; or

(b) any other equivalent published standard that is acceptable to the Director.

16.3 Interpretation of results – Holmes-Wright Colour Vision Test

16.3.1 An error is recorded in the Holmes-Wright lantern Colour Vision test if there is a mistake in naming any of the colours that is presented. A second run of nine presentations is only required if the subject makes one or more errors on the initial run.

16.3.2 The results of the Holmes-Wright lantern Colour Vision test are

interpreted as a pass if:

(a) there are no errors during the initial run of nine presentations; or

(b) there are errors during the initial run of nine presentations, and there are no errors during the second run of nine presentations.

16.3.3 Otherwise the results of the Holmes-Wright lantern Colour Vision test are interpreted as a fail. A fail test result cannot be ignored following a subsequent pass result.

16.4 Reporting requirements – Holmes-Wright Lantern Colour Vision Test

The results of the Holmes-Wright lantern Colour Vision test must be reported in a manner that clearly indicates whether the subject passed or failed the test. The results should also specify the nature and number of any errors made.

16.5 Period of validity of results – Holmes-Wright Lantern Colour Vision Test

The results of a Holmes-Wright Lantern Colour Vision test are valid for an indefinite period unless there is clinical suggestion that the applicant's Colour Vision deficiency may have changed.

Section 17: City of London Colour Assessment and Diagnosis Colour Vision Test

17.1 City of London Colour Assessment and Diagnosis Colour Vision Test

17.1.1 The *Colour Assessment and Diagnosis* (CAD) (City of London) Colour Vision test is an examination of Colour Vision function that provides detailed assessment of red / green and yellow / blue colour perception.

17.1.2 The CAD test isolates the use of colour signals and requires the applicant to report the direction of moving colour-defined pattern displayed on a calibrated visual screen. The moving test pattern changes randomly in colour, saturation and motion direction. The test cannot be learnt.

17.2 Conduct of examination – City of London CAD Colour Vision Test

17.2.1 An applicant who undertakes a CAD Colour Vision test must produce evidence of their identity as outlined in Part 1, paragraph 5 (Applicant proof of identity) of these General Directions.

17.2.2 A Medical Examiner must ensure that a CAD Colour Vision test is conducted in accordance with –

(a) the manufacturer's instructions for the CAD Colour Vision test device; or

(b) any other equivalent published standard that is acceptable to the Director.

17.2.3 The CAD test may be undertaken including any of the options and settings available (e.g. 'screen', 'environment', or 'certification'), but must include the Full(Definitive) option which identifies the class of Colour Vision involved (i.e., normal trichromacy, deutan or protan-like deficiency or acquired deficiency) and quantifies the severity of red / green and yellow / blue loss.

17.2.4 If the RG threshold result falls in the range of 4.8 – 7.2SN (inclusive) for deutan deficiency and 9.6 – 14.4SN (inclusive) for protan deficiency, then the definitive CAD test must be repeated three more times. This option is

offered automatically by the program. If the RG threshold result is outside those ranges no repeats are necessary.

17.3 Interpretation of results – City of London CAD Colour Vision Test

17.3.1 The results of the definitive CAD Colour Vision test are interpreted as a pass if and only if:

(a) the final 'definitive' result is less than 6SN (Standard Normal CAD units) for a deutan type defect; or

(b) the final 'definitive' result is less than 12SN (Standard Normal CAD units) for a protan type defect.

17.3.2 Otherwise the results of the CAD Colour Vision test are interpreted as a fail.

17.4 Reporting requirements – City of London CAD Colour Vision Test

The results of the CAD Colour Vision test must be reported in a manner that clearly indicates whether the subject passed or failed the test. The results should also specify the number of test runs performed in the event that repeats were undertaken.

17.5 Period of validity of results – City of London CAD Colour Vision Test

The results of a CAD Colour Vision test are valid for an indefinite period unless there is suggestion that the applicant's Colour Vision deficiency may have changed. A fail test cannot be ignored following a subsequent pass result.

Schedule 2
Non-routine examinations: general

and

Schedule 3
Non-routine examinations: nervous system

1. If an applicant must have a non-routine examination that may be clinically indicated and that relates to the standard prescribed in Civil Aviation Rule 67.103, 67.105, or 67.107, a Medical Examiner must ensure that the examination requirements in clause 2 comply with—

   (a) the Act; and

   (b) Part 67 of the Rules; and

   (c) any General Directions notice issued under section 27G of the Act; and

   (d) current best medical practice that applies in New Zealand, except to the extent that any of paragraphs (a) to (c) applies.

2. The examination requirements are —

   (a) the conduct of the non-routine examination:

   (b) the interpretation of the results of the non-routine examination:

   (c) the reporting requirements for the non-routine examination:

   (d) the period of validity of the results of the non-routine examination.

Schedule 4
Non-routine examinations: cardiovascular system

1. If an applicant must have a non-routine examination that may be clinically indicated and that relates to the standard prescribed in Civil Aviation Rule 67.103(d) (cardiovascular system), 67.105(d) (cardiovascular system), or 67.107(d) (cardiovascular system), a Medical Examiner must ensure that the examination requirements in clause 2 comply with —

   (a) the Act; and

   (b) Part 67 of the Rules; and

   (c) any General Directions notice issued under section 27G of the Act; and

   (d) current best medical practice that applies in New Zealand, except to the extent that any of paragraphs (a) to (c) applies.

2. The examination requirements are —

   (a) the conduct of the non-routine examination:

   (b) the interpretation of the results of the non-routine examination:

   (c) the reporting requirements for the non-routine examination:

   (d) the period of validity of the results of the non-routine examination.

Section 1: Exercise Stressed Electrocardiography

1.1 Definition

Exercise Stressed Electrocardiography is a specialised heart test intended to identify or exclude reversible ischaemia (lack of blood supply) to parts of the heart during exercise. This test has a number of other names including *Stress Test*, *Exercise ECG*, *Exercise Test*, and *Exercise Tolerance Test* (ETT).

Exercise Stressed Electrocardiography does not include pharmacological agent stress testing.

1.2 Conduct of examination

1.2.1 Exercise Stressed Electrocardiography should be performed by expert personnel according to the current relevant national, regional, or international standards/guidelines[2].

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[2] Further guideline information concerning Exercise Stressed Electrocardiography may be found at:
Exercise Tolerance Testing. Hill J and Timmis A. British Medical Journal, 324(7345): 1084-1087 (2002) - http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1123032/
ACC/AHA 2002 Guideline Update for Exercise Testing. Gibbons R J et al. American College of Cardiology Foundation and American Heart Association (2002) - https://my.americanheart.org/idc/groups/ahaecc-internal/@wcm/@sop/documents/downloadable/ucm_423807.pdf

1.2.2 The subject should preferably have been continuously in the time zone where testing is performed for at least 48 hours prior to the test.

1.2.3 The subject should normally cease taking any beta-blocker medication at least 48 hours prior to the stress test, unless contraindicated (i.e. if the medication is used to treat known ischaemic heart disease or a significant arrhythmia). When a beta-blocker is not ceased prior to stress testing an applicant, an explanation of the reason is required from the treating or investigating cardiologist who supervises the stress test.

1.2.4 Typically, this test employs a treadmill to expose the subject to accurately graded exercise levels over time. Sometimes a calibrated bicycle ergometer is used instead of a treadmill.

1.2.5 The full Bruce Protocol is to be used, incorporating up to seven 3-minute stages and continued tracing during recovery until heart rate, blood pressure, and ECG trace have returned to near-baseline values (at least 6-minutes into recovery). The test should be symptom-limited unless clinically contraindicated.

1.2.6 12-lead ECG tracings, heart rate, blood pressure and symptoms (if any) should be recorded before the test (at rest) during the test at intervals and regularly during the post-test recovery period. These values, as well as the workloads undertaken and the reason for terminating the test, must be clearly recorded and reported.

1.3 Interpretation of results

The purpose of an exercise stressed electrocardiogram is usually to demonstrate 'normal myocardial perfusion' in response to excessive cardiovascular risk factors identified under the CAA cardiovascular system medical standards (e.g. Civil Aviation Rules 67.103(d)(4), 67.105(d)(4), and 67.107(d)(4)).

The results of an exercise stressed electrocardiogram are initially interpreted by the cardiologist or physician responsible for performing the test. Further interpretation may be undertaken by the CAA.

Generally, an exercise stressed electrocardiogram will be interpreted as being positive if:

(a) There are electrocardiographic changes suggestive of myocardial ischaemia (e.g. 1.0 mm or more of horizontal or down-sloping ST segment depression at 0.08 sec after the J point); or

(b) There is arrhythmia suggestive of ischaemia; or

(c) There are symptoms or signs suggestive of myocardial ischaemia (e.g. chest pain) despite the absence of suggestive electrocardiographic changes.

1.4 Reporting requirements

The results of an exercise stressed electrocardiogram must be fully documented and sent to the CAA. This will include:

(a) The full ECG tracings of the test, including the recovery period;

(b) Workload, heart rate, blood pressure, and symptom data from throughout the test, including the recovery period;

(c) The reason for termination of the test; and

(d) The report of the cardiologist or physician responsible for undertaking or interpreting the test.

1.5 Period of validity of results

The results of an exercise stressed electrocardiogram, undertaken because of excess cardiovascular in the absence of known coronary artery disease, are valid for a period of 12 months from the date of the examination in the case of a Class 1 applicant and 24 months in the case of a Class 2 or 3 applicant.

Section 2: CT Calcium scoring

2.1 Definition

CT calcium scoring is the use of CT scan to check for deposits or build-up of plaque on the walls of coronary arteries. Plaque is made up of calcium, fat and cholesterol. The amount of calcified plaque is reported as a score.

2.2 Conduct of examination

The examination is conducted in specialised facilities using a CT scan.

2.3 Interpretation of results

The purpose of a calcium CT score is to demonstrate and quantify any calcified plaque in coronary arties. This is to estimate coronary artery disease in response to excessive cardiovascular risk factors identified under the CAA cardiovascular system medical standards (e.g. Civil Aviation Rules 67.103(d)(4), 67.105(d)(4), and 67.107(d)(4)).

The main systems for the quantification of the calcium score are the Agatston method, the determination of the volume of calcium, and the determination of the calcium mass score. The first two are the most widely used. In particular the Agatston method which is used as a reference for most population databases and publications involving risk stratification. It is therefore the method most often used in clinical practice.

An Agatston score of **zero** is acceptable evidence that the estimated elevated cardiovascular risk is not of aeromedical significance.

2.4 Reporting requirements

The complete calcium Agatston score report must be provided along with the ME report.

2.5 Period of validity of results

The results of a calcium scoring of zero have a validity period of 5 years unless there is clinical suggestion of a change in medical condition.

Schedule 5
Non-routine examinations: respiratory system

Schedule 6
Non-routine examinations: alimentary and endocrine systems

Schedule 7
Non-routine examinations: reticuloendothelial and immune systems

Schedule 8
Non-routine examinations: genitourinary system

Schedule 9
Non-routine examinations: reproductive system

Schedule 10
Non-routine examinations: musculoskeletal system

Schedule 11
Non-routine examinations: ear, nose, and throat

1. If an applicant must have a non-routine examination that may be clinically indicated and that relates to the standard prescribed in Civil Aviation Rules 67.103 67.105 or 67.107 a Medical Examiner must ensure that the examination requirements in clause 2 comply with —

   - (a) the Act; and
   - (b) Part 67 of the Rules; and
   - (c) any General Directions notice issued under section 27G of the Act; and
   - (d) current best medical practice that applies in New Zealand, except to the extent that any of paragraphs (a) to (c) applies.

2. The examination requirements are —

   - (a) the conduct of the non-routine examination:
   - (b) the interpretation of the results of the non-routine examination:
   - (c) the reporting requirements for the non-routine examination:
   - (d) the period of validity of the results of the non-routine examination.

Schedule 12
Non-routine examinations: hearing

Section 1: Bone-conduction audiometry

1.1 Definition

Bone audiometry means the examination of bone-conduction hearing thresholds.

1.2 Conduct of examination

A Medical Examiner must ensure that bone-conduction audiometry is conducted in accordance with —

(a) ISO 8253; or

(b) AS/NZS 1269.4:

(c) any other equivalent published standard that is acceptable to the Director.

1.3 Interpretation of results

There are no pass or fail criteria for bone-conduction audiometry. The results of bone-conduction audiometry must be interpreted in conjunction with all other findings having regard to the guidelines contained in the CAA Medical Manual to determine the aeromedical significance of any hearing impairment.

1.4 Reporting requirements

The results of bone-conduction audiometry must be reported on the audiometry report (form CAA 24067/203, or an electronic version of that form).

1.5 Period of validity of results

The results of bone-conduction audiometry are valid for a period of 12 months from the date of the examination.

Section 2: Hearing-in-operational-conditions (in-flight) examination

2.1 Definition

Hearing-in-operational-conditions (in-flight) examination means a hearing test undertaken in operational conditions similar to those experienced during flight.

2.2 Conduct of examination

A hearing-in-operational-conditions (in-flight) examination may only be performed by a Category A or B flight instructor or a flight examiner.

2.3 Interpretation of results

There are no pass or fail criteria for a hearing-in-operational-conditions (in-flight) examination. The results of a hearing-in-operational-conditions (in-flight) examination must be interpreted in conjunction with all other findings having regard to the guidelines contained in the CAA Medical Manual.

2.4 Reporting requirements

The person who performs a hearing-in-operational-conditions (in-flight) examination must provide the Medical Examiner with an In-Flight Hearing Assessment form (24067-204, or an electronic version of that form), which includes the following:

(a) the results of the examination (including relevant findings and observations):

(b) how the examination was performed.

2.5 Validity period of results

The results of a hearing-in-operational-conditions (in-flight) examination are valid for a period of 12 months from the date of the examination.

Section 3: Hearing-in-operational-conditions (ATC) examination

3.1 Definition

Hearing-in-operational-conditions (ATC) examination means a hearing test undertaken in operational conditions similar to those experienced during air traffic control operations.

3.2 Conduct of examination

A hearing-in-operational-conditions (ATC) examination may be performed only by an air traffic controller examiner.

3.3 Interpretation of results

There are no pass or fail criteria for a hearing-in-operational-conditions (ATC) examination. The results of a hearing-in-operational-conditions (ATC) examination must be interpreted in conjunction with all other findings having regard to the guidelines contained in the CAA Medical Manual.

3.4 Reporting requirements

The person who performs a hearing-in-operational-conditions (ATC) examination must provide the Medical Examiner with a written report, which includes the following:

(a) the results of the examination (including relevant findings and observations):

(b) how the examination was performed.

3.5 Validity period of results

The results of a hearing-in-operational-conditions (ATC) examination are valid for a period of 12 months from the date of the examination.

Signed this 23rd day of Dec 2020 at Wellington

Shelley Turner, Acting Director of Civil Aviation

Explanatory note

This note is not part of the notice but is intended to indicate its general effect.

This notice —

- provides for the conduct of examinations of applicants and licence holders, and the reporting of the results of those examinations to the Director; and
- specifies the requirements of examinations or other clinical matters, including,—
  - the medical content of examinations:
  - the interpretation and analysis of results of examinations:
  - the significance of results of examinations for the purpose of determining whether or not an applicant is eligible for a medical certificate under section 27B of the Civil Aviation Act 1990.

Schedule 1 sets out requirements for routine examinations.

The requirements for non-routine examinations are set out in Schedules 2 to 13. Each schedule relates to the standard prescribed in the Civil Aviation Rules for each system.

From time to time it is intended that further requirements for specified non-routine examinations will be included in each of those schedules using a format similar to that used in Schedule 1 (routine examinations) and Schedule 12 (non-routine examinations: hearing).

The timing requirements for routine examinations are set out in the current Civil Aviation (Timetable of Routine Examinations) General Directions Notice.

These General Directions will be incorporated in a medical manual issued by the Director and made available on the website of the Civil Aviation Authority.

Issued under the authority of the Acts and Regulations Publication Act 1989.

This notice is administered by the Civil Aviation Authority.

Signed this 23rd day of December 2020 at Wellington

Shelley Turner, Acting Director of Civil Aviation