Description of the proposed General Directions: Colour Vision Deficiency

This introductory information is not part of the proposed General Directions (GD) proper but intended as support and explanation to assist with the public consultation process of that GD.

Contents of the proposed GD

This proposed GD (*Colour Vision Deficiency*) is a revision of the similarly named draft GD that underwent public consultation during 2004, 2006, 2009 and 2013 - 2015. The purpose of the revision is to incorporate previous consultation feedback and to update the provisions of the proposed general directions. Changes from the previous versions of this draft GD are:

- the use of the standard (H53.5 ICD-10) term Colour Vision Deficiency (CVD) where appropriate;
- simplification of the screening and workup of applicants with colour vision deficiency;
- inclusion of an option for restricted certification in the absence of further colour vision testing;
- an update of the conditions applied to those Colour Vision Deficient applicants who are issued restricted medical certificates;
- inclusion of additional secondary screening options for all Colour Vision Deficient applicants, including the Colour Assessment and Diagnosis (CAD) test and Farnsworth D15 test;
- inclusion of an operational colour vision assessment (OCVA), comprising a practical flight assessment, and
- a similar approach to screening and workup of applicants with colour vision deficiency is applied for each of the three classes of medical certificate. This has allowed the "Decision flow-diagram" for each class to be incorporated into a single flow-diagram at Annex A to the GD.

Other material

Also included in this consultation bundle are:

- An introductory section titled "Proposed Colour Vision Deficiency GD" containing explanatory material.
- Proposed consequential amendments to other general directions – specifically the Civil Aviation (Examination Procedures) General Direction Notice. This amendment includes an annex including the CVD assessment flow-diagram outlined above, guidance to applicants for CVD assessment, the OCVA assessment form and guidance for instructors conducting the assessment.
- Proposed consequential amendments to CAA Advisory Circular AC61-20.
- Proposed consequential amendments to CAA MIS 006.

How this GD works as an element of the medical certification system

Section 27G(1) of the Civil Aviation Act 1990 provides for the Director to issue general directions in relation to –

(a) conducting examination of applicants and licence holders, and reporting the results of those examinations to the Director; and

(c) specifying the requirements of examinations or other clinical matters, which must be reasonable, including, but not limited to -

(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.

Civil Aviation Rule 67.3 includes the definition of the term aeromedical significance. A medical condition is of aeromedical significance if, having regard to any relevant general direction, it interferes or is likely to interfere with the safe exercise of the privileges or the safe performance of the duties to which the relevant medical certificate relates.

Most of the medical standards in Part 67 (civil aviation rules 67.103, 67.105, and 67.107) refer directly or indirectly to a requirement that an applicant have no medical condition that is of aeromedical significance.

This statutory construct allows for general directions (GDs) to be used to describe requirements relating to the ‘examinations and other clinical matters’ necessary for determining whether an applicant is eligible for the issue of a medical certificate. The Part 67 reference in the medical standards to the GDs also allows GDs to be used to define how ‘examinations and other clinical matters’ can be interpreted for the purpose of determining whether an applicant meets the medical standards published in the Rules.

This particular GD describes the requirements for the medical certification of applicants who are colour vision deficient. It specifies several options and the certification outcomes that apply to each of those options.

By formalising this policy as a GD, the administrative processing of most colour vision deficient applicants will occur in accordance with section 27B(1) of the Act. This will avoid direct CAA involvement (in most cases) and obviate the need for an Accredited Medical Conclusion (AMC) under the flexibility provisions in the Act.

This GD introduces the City of London Colour Assessment and Diagnosis (CAD) colour vision test and the Farnsworth D15 test as secondary screening options, both of which are used by other regulatory authorities.

This GD also introduces the Operational Colour Vision Assessment (OCVA) for applicants who fail clinical screening and testing procedures, but wish to demonstrate competency in a practical flight assessment. This assessment is aligned to that utilised by the US FAA for the same purposes.

The GD updates the restrictions that are applied to those who fail initial screening and then either fail, or elect to not undertake, secondary screening. Restrictions against instrument flying (Class 1 and 2) are no longer applied to the certificate. For those who pass the day time component of an OCVA, restrictions against the carriage of passengers (Class 1) may be removed. For applicants who also pass the night component, restrictions against night flying (Class 1 and 2) may be removed.

Such was the significance of material considered in the development of this GD, the CAA established a CVD GD Assessment Panel comprising specialists in aviation medicine, vision science, general aviation, airline operations, regulatory oversight and law. The panel considered written and verbal submissions from various international contributors and experts, empirical evidence, and clinical research relating to colour vision deficiency in pilots. The panel noted that current clinical test methods and restrictions result in significant limitations for some applicants who would be able to operate unrestricted in some other jurisdictions. Therefore, the panel produced a report recommending the adoption of a practical demonstration of competency as well as alternative secondary screening tests that allow these individuals to demonstrate competency. These recommendations have been accepted by the Director.

Civil Aviation
(Colour Vision Deficiency)
General Directions Notice 2018

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 and elsewhere, government departments, and Crown agencies that the Director considers appropriate, gives the following notice.

Contents

I. General Directions

1. Title

These general directions are the Civil Aviation (Colour Vision Deficiency) General Directions 2018.

2. Commencement

These general directions come into force on [DATE].

3. Purpose

The purpose of these general directions is to specify the requirements for examinations or other clinical matters, for applicants who have, or may have, any colour vision deficiency, including, but not limited to,—

(a) the medical content of examinations:

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

(c) 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. Definitions

In these general directions, unless the context otherwise requires,—

Act means the Civil Aviation Act 1990.

Applicant means an applicant for a class 1, class 2, or class 3 medical certificate issued under Part 2A of the Act.

Colour Vision Deficiency, in relation to an applicant, means a colour vision impairment (or deficit of colour vision) that results in the applicant failing the colour vision screening examination (Ishihara).

Medical certificate means:

- a medical certificate issued by the Director under Part 2A of the Act to an applicant or licence holder; or
- a medical certificate recognised by the Director under the rules.

Rules means the Civil Aviation Rules.

5. Interpretation

A term or expression that is defined in the Act, the Civil Aviation Rules, or the Civil Aviation (Examination Procedures) General Directions Notice and used but not defined in these general directions has the same meaning as in the Act, the Civil Aviation Rules, or the Civil Aviation (Examination Procedures) General Directions Notice.

6. Status of Examples and Notes

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

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

7. Interpretation of discrepant results

(1) Colour vision screening must be undertaken as required by the Civil Aviation Timetable for Routine Examinations General Directions Notice 2009.

(2) If there is a significant discrepancy between the results of a recent vision examination and any past colour vision examinations then the medical examiner should resolve the discrepancy by —

(a) consulting the applicant's CAA medical file to assist in determining which results should be relied upon; or

(b) seeking further colour vision examinations to assist in determining which results should be relied upon.

8. Screening an applicant with a colour vision deficiency that has become apparent since the applicant's last colour vision screening examination (Ishihara)

(1) If, since the applicant's last colour vision screening examination (Ishihara), an applicant's medical condition has changed in any way that suggests the presence of a colour vision deficiency that may be of aeromedical significance, then the medical examiner must consider the results of a colour vision screening examination (Ishihara) undertaken since the change in the applicant's medical condition.

Note:
It is relatively rare for colour vision status to change. However medical conditions such as diabetic (or other) retinopathy, the use of some medications, or the implantation of intraocular lenses can lead to a change in colour vision status.

(2) Subclause (1) applies despite anything to the contrary in the—

(a) Civil Aviation (Timing for Routine Examinations) General Directions Notice; or

(b) Civil Aviation (Examination Procedures) General Directions Notice.

9. Relevant colour vision screening examination (Ishihara) results to interpret and analyse

For the purpose of these general directions, the determination of whether an applicant is colour vision deficient relies on the interpretation and analysis of the results of a colour vision screening examination (Ishihara) undertaken by the applicant. The medical examiner must consider the most recent colour vision screening examination (Ishihara), but should not ignore or discount any previous colour vision screening examinations (Ishihara) undertaken by the applicant.

10. Relevant non-routine examination results to interpret and analyse

If an applicant has colour vision deficiency, the medical examiner must either assess the applicant as described in clause 11(3), or analyse and interpret the results from the most recent test undertaken by the applicant according to the following—

(a) Holmes-Wright lantern type A or Type B colour vision test; or

(b) Farnsworth lantern (FALANT) colour vision test and Anomaloscope (Nagel or Neitz) colour vision test; or

(c) Colour Assessment and Diagnosis (CAD) colour vision test; or

(d) Farnsworth D15 test.

Refer to the Civil Aviation (Examination Procedures) GD Notice for test details.

11. Significance of examination results

(1) If the applicant has colour vision deficiency and passes any of the tests in clause 10, the medical examiner may assess the applicant as having a colour vision deficiency that is not of aeromedical significance.

(2) If the applicant is colour vision deficient and:

(a) fails the Holmes-Wright lantern colour vision test; or

(b) fails the Farnsworth lantern (FALANT) colour vision test; or

(c) passes the Farnsworth lantern (FALANT) colour vision test and has any result indicating a colour vision deficiency that is either protanopic or protanomalous in nature; or

(d) fails the CAD test; or

(e) fails the Farnsworth D15 test; the medical examiner must assess the applicant as described in paragraph (3).

(3) An applicant who either:

(a) does not undertake the further colour vision testing as described in clause 10; or

(b) fails the further colour vision testing as described in paragraph (2); must be assessed as follows —

Class 1 and Class 2

Assess the applicant for Class 1 and Class 2 medical certificates as having a colour vision deficiency that is not of aeromedical significance provided the medical certificate is issued with the following restrictions—

‘Not valid for flight in the vicinity of a controlled aerodrome unless the aircraft is in radio contact with aerodrome control.’

'Not valid for air operations carrying passengers.'

'Not valid for night flying.'

Class 3

Assess the applicant for a Class 3 medical certificate as having a colour vision deficiency that is of aeromedical significance.

12. Practical demonstration of ability in an operational colour vision assessment

(1) Applicants, who fail colour vision screening and the further tests listed in clause 10, may undertake an operational colour vision assessment (OCVA). If the applicant passes the day time component of the OCVA, the restrictions on their medical certificate may be reduced to –

'Not valid for flight in the vicinity of a controlled aerodrome unless the aircraft is in radio contact with aerodrome control.'

'Not valid for night flying.'

(2) If the applicant passes the day and night components of the OCVA, the restrictions on their medical certificate may be reduced to –

'Not valid for flight in the vicinity of a controlled aerodrome unless the aircraft is in radio contact with aerodrome control.'

(3) The OCVA involves a practical check of an individual's colour vision in the operational aviation environment on the ground and during flight. The assessment is to be carried out by an 'A' Category flying instructor/examiner who has received CAA training in the procedures and conduct of the OCVA and is operating within an organisation holding a Part 141 certificate. The day component of OCVA will be undertaken in daylight, while the night component will be undertaken at night. The practical component of the day and night assessment must be carried out in an actual aircraft; a simulator, regardless of certification standard or approvals, cannot be used for the OCVA. The applicant will be required to demonstrate the ability to:

a) Read and correctly interpret in a timely manner aeronautical charts, including print in various sizes, colours and fonts as well as symbols, lines and terrain markings.

b) Read and correctly interpret in a timely manner aircraft instrumentation and displays.

c) Recognise terrain and obstructions in a timely manner.

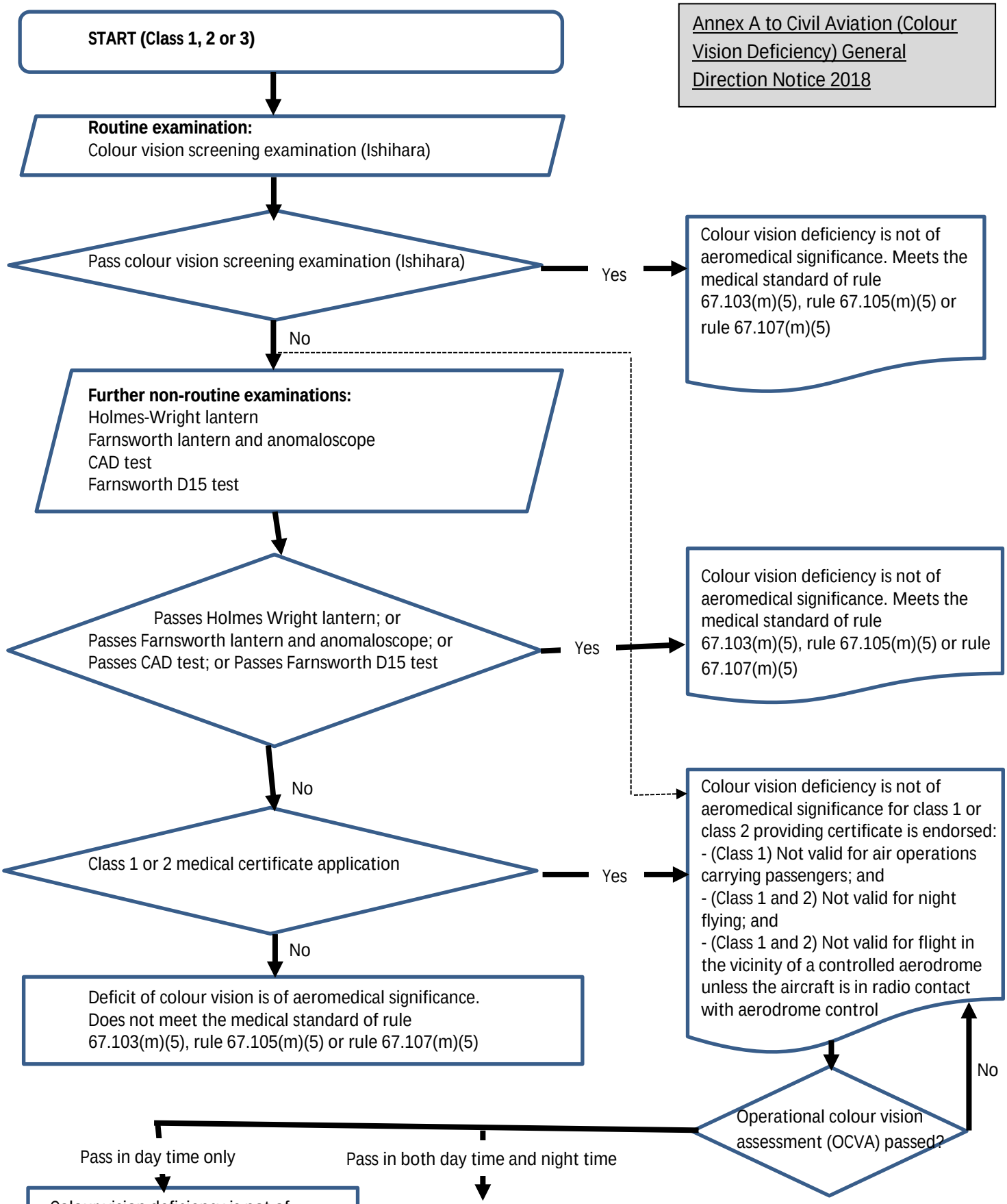
d) At night, visually identify in a timely manner the location and significance of aeronautical lights including those associated with other aircraft and airfields.

(4) As the OCVA requires the applicant to demonstrate satisfactory performance in aviation-related operational activities, it is desirable that the applicant has some aviation experience before undertaking the assessment. It is therefore best undertaken part way through training, probably at or near the point where a pilot would normally undertake the PPL flight test or have some night flying experience prior to completing a night rating. However, it is the applicant's responsibility to decide at what stage they undertake the OCVA. If the applicant undertakes an OCVA before starting, or early

within their flight training, it is recommended they seek the advice of an A or B category instructor as to when the assessment should be completed. The OCVA is a stand-alone assessment and cannot be combined with other flight testing activities such as the issue or renewal of a flight crew licence, the issue or renewal of a flight crew rating, initial or periodic flight crew competency tests or operational checks, or Biennial Flight reviews.

(5) A flow-diagram of the CVD test sequence is attached at Annex A to this GD.

Annex A to Civil Aviation (Colour Vision Deficiency) General Direction Notice 2018



13. Information to be made available for AMC

If the medical examiner assesses the applicant as not meeting the medical standard prescribed in rule 67.103(m)(5), 67.105(m)(5), or 67.107(m)(5) and the medical examiner elects to consider the application further under the flexibility provisions of section 27B of the Act, the medical examiner:

(a) must ensure that the results of all of the colour vision examinations considered by the medical examiner are made available for the purposes of reaching an accredited medical conclusion (AMC); and

(b) should consider providing the results of the following, or other similar, additional colour vision tests undertaken by the applicant are made available for the purposes of reaching an accredited medical conclusion (AMC) -

(i) Holmes-Wright lantern colour vision test;

(ii) Farnsworth lantern (FALANT) colour vision test and anomaloscope (Nagel or Neitz) colour vision test;

(iii) CAD test;

(iv) Farnsworth D15 test;

(v) Operational colour vision assessment (OCVA).

Note:
Detailed information concerning the various colour vision tests and OCVA outlined above can be found in the Civil Aviation (Examination Procedures) General Directions Notice.

II. Consequential Amendments to other General Directions

Civil Aviation (Examination Procedures) General Directions Notice

The following provisions are intended for insertion:

- As a new Clause 8 in Part 2 of the Civil Aviation (Examination Procedures) General Directions Notice, and

- Into Part 2, Schedules 1 and 13 of the Civil Aviation (Examination Procedures) General Directions Notice.

Part 2 Examination Procedures

Replace the proof of identity requirements throughout the general direction with a single requirement inserted as Clause 8 in Part 2:

8. 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 photographic identity documents are acceptable for that purpose:

(a) a current New Zealand passport;

(b) a current New Zealand driver licence;

(c) a current photographic identity card issued by the New Zealand Defence Force, New Zealand Police or the New Zealand Fire Service;

(d) a current CAA airport identity card;

(e) a valid and current passport or national identity document issued by another country.

(2) An equivalent alternative form of photographic identification, not listed above, may also be acceptable to the Director (Refer AC 67-1).

Part 2 Examination procedures

Schedule 1 Routine examinations

Section 11: Colour vision screening examination (Ishihara)

Replace Part 2, Schedule 1, Section 11 with the following text:

11.1 Definition

11.1.1 The colour vision screening examination (Ishihara) is a screening examination of colour vision function. Screening is undertaken as required by the Civil Aviation Timetable for Routine Examinations General Directions Notice 2009.

11.1.2 The colour vision screening examination (Ishihara) employs the Ishihara pseudoisochromatic 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.

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

11.2 Conduct of examination

11.2.1 An applicant who undertakes a colour vision screening examination (Ishihara) must produce evidence of their identity as outlined in Part 1, Section 5 (Applicant proof of identity) of these general directions.

11.2.2 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.

11.2.3 Unless otherwise specified 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.

11.2.4 The medical examiner must test the applicant with all of the adult numerical test plates contained within the plate set used.

11.3 Interpretation of results

11.3.1 The results of the colour vision screening examination (Ishihara) are interpreted as a pass when:

(a) the applicant makes no errors on the adult numerical test plates of a 14 or 16 – plate Ishihara plate set; or

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

(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.*

11.3.2 Otherwise the results of the colour vision screening examination (Ishihara) are interpreted as a fail.

11.4 Reporting requirements

11.4.1 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).

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 records the results of the colour vision screening examination (Ishihara).

11.5 Period of validity of results

11.5.1 The results of a colour vision screening examination (Ishihara) are valid for an indefinite period unless there is any clinical suggestion that the applicant's colour vision deficiency may have changed.

Schedule 13 Non-routine examinations: Vision

Replace the contents of Schedule 13 with the following text:

Section 1: Anomaloscope (Nagel or Neitz) colour vision test

3.1 Definition

3.1.1 The Anomaloscope (Nagel or Neitz) colour vision test is an examination of colour vision function.

3.1.2 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 preferred means for diagnosis of protan and deutan colour vision deficiencies.

3.2 Conduct of examination

3.2.1 An applicant who undertakes an anomaloscope (Nagel or Neitz) colour vision test must produce evidence of their identity as outlined in Part 1, Section 5 (Applicant proof of identity) of these general directions.

3.2.2 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.

3.3 Interpretation of results

3.3.1 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.

3.4 Reporting requirements

3.4.1 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.

3.5 Period of validity of results

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

Section 2: Farnsworth lantern (FALANT) colour vision test

6.1 Definition

6.1.1 The Farnsworth lantern (FALANT) colour vision test is an examination of colour vision function.

6.1.2 The 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.

6.2 Conduct of examination

6.2.1 An applicant who undertakes a FALANT)colour vision test must produce evidence of his or her identity as outlined in Part 1, Section 5 (Applicant proof of identity) of these general directions.

6.2.2 A medical examiner must ensure that a FALANT colour vision test is conducted in accordance with —

(a) the manufacturer's instructions for the FALANT colour vision test device; or

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

6.3 Interpretation of results

6.3.1 An error is recorded in the 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.

6.3.2 The results of the 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.

6.3.3 Otherwise the results of the FALANT colour vision test are interpreted as a fail.

6.4 Reporting requirements

6.4.1 The results of the 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.

6.5 Period of validity of results

6.5.1 The results of a FALANT colour vision test are valid for an indefinite period unless there is any clinical suggestion that the applicant's colour vision deficiency may have changed.

Section 3: Holmes-Wright lantern colour vision test

7.1 Definition

7.1.1 The Holmes-Wright lantern colour vision test is an examination of colour vision function.

7.1.2 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.

7.2 Conduct of examination

7.2.1 An applicant who undertakes a Holmes-Wright lantern colour vision test must produce evidence of their identity as outlined in Part 1, Section 5 (Applicant proof of identity) of these general directions.

7.2.2 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.

7.3 Interpretation of results

7.3.1 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 presentation is only required if the subject makes one or more errors on the initial run.

7.3.2 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.

7.3.3 Otherwise the results of the Holmes-Wright lantern colour vision test are interpreted as a fail.

7.4 Reporting requirements

7.4.1 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.

7.5 Period of validity of results

7.5.1 The results of a Holmes-Wright lantern colour vision test are valid for an indefinite period unless there is any clinical suggestion that the applicant's colour vision deficiency may have changed.

Section 4: Colour Assessment and Diagnosis (CAD) (City of London) colour vision test

8.1 Definition

8.1.1 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.

8.1.2 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.

8.2 Conduct of examination

8.2.1 An applicant who undertakes a CAD colour vision test must produce evidence of his or her identity as outlined in Part 1, Section 5 (Applicant proof of identity) of these general directions.

8.2.2 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.

8.2.3 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.

8.2.4 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.

8.3 Interpretation of results

8.3.2 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.

8.3.3 Otherwise the results of the CAD colour vision test are interpreted as a fail.

8.4 Reporting requirements

8.4.1 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.

8.5 Period of validity of results

8.5.1 The results of a CAD colour vision test are valid for an indefinite period unless there is any suggestion that the applicant’s colour vision deficiency may have changed.

Section 5: Farnsworth D15 colour vision test

9.1 Definition

9.1.1 The Farnsworth D15 test is one of the most widely used hue discrimination tests. It will identify moderate and severe protans, deutans and tritans. The test is based on colour confusion: protans confuse certain reds and greens; deutans confuse other reds and greens.

9.1.2 It consists of 15 moveable matte colour samples, selected from an incomplete hue circle, placed in a box with one fixed colour sample. The colour samples are held in circular caps that subtend 1.5° at a test distance of 0.5 m. The colours range from blue through blue-green, yellow-green, yellow, orange and red to red-purple. The moveable caps are numbered on the backs according to the ideal colour circle. The level of difficulty of the test is such that a person who fails the test will have difficulty distinguishing surface colour codes.

9.2 Conduct of examination

9.2.1 An applicant who undertakes a Farnsworth D15 colour vision test must produce evidence of his or her identity as outlined in Part 1, Section 5 (Applicant proof of identity) of these general directions.

9.2.2 For the Farnsworth D15 colour vision test, all the colour caps, except the reference colour, are removed from the box and mingled on the table in front of the subject. The subject is then asked to put the caps back in the box in what they perceive to be a natural colour order. The subject must start from the one fixed reference cap, which will require them to find the coloured cap that looks most like the colour of the cap already in the box and put it next to it. They then carry on from there finding the colour nearest to the last one placed in the box until the last cap is used. They are asked to look again at the finished order, when all the caps are in the box, to see if they want to make any changes.

9.2.3 Unless specified otherwise in the manufacturer’s instructions, the medical examiner must ensure that the Farnsworth D15 test is conducted — in daylight conditions or under illuminate D65 conditions (as provided by a Philips 96 fluorescent tube light).

9.3 Interpretation of results

9.3.1 After the final review of the order by the subject, the examiner records the number order on the back of the caps. The results are then transferred to the results diagram. A line is drawn joining the cap numbers as arranged by the subject. As all the colours are presented at the same time, isochromatic colour confusions are demonstrated when colours from opposite sides of the hue circle are mingled in the subject's arrangement. The record sheet provides an aid to interpretation by illustrating the direction of lines representing typical isochromatic confusions in protan, deutan and tritan colour deficiency.

9.3.2 One transportation of adjacent colours indicates a minor error or 'normal' confusion. Caps that are placed on the wrong side of the hue circle are considered a major error. People with normal colour vision and slight colour deficiency pass, and typical results are obtained in moderate/severe protan, deutan and tritan deficiency. The number of isochromatic confusions made is used to identify the two grades of deficiency, moderate and severe.

9.3.3 Axes on the scoring sheet parallel the protan, deutan and tritan axes and indicate the sort of deficit involved. Caps placed on the wrong side of the circle are considered a major error. Caps placed in an adjacent position on the same side of the circle indicate a minor error or normal confusion. Two minor errors are considered to be within normal limits. Dichromats and extreme anomalous trichromats will produce six to twelve major errors. The test is failed if there are two or more major errors.

9.4 Reporting requirements

9.4.1 The results of the Farnsworth D15 colour vision test must be reported in a manner that clearly indicates whether the subject passed or failed the test. The results should also state the number of major errors made and the sort of deficit, as indicated by the axes crossed.

9.5 Period of validity of results

9.5.1 The results of a Farnsworth D15 colour vision test are valid for an indefinite period unless there is any clinical suggestion that the applicant’s colour vision deficiency may have changed.

Section 6: Operational colour vision assessment

10.1 Definition

10.1.1 Applicants, who fail colour vision screening and the further clinical tests, may undertake an operational colour vision assessment (OCVA). If the applicant passes the day time component of the OCVA, and they have no other relevant aeromedical conditions, they will have restrictions on their medical certificate reduced to –

> *‘Not valid for flight in the vicinity of a controlled aerodrome unless the aircraft is in radio contact with aerodrome control.’*
>
> *‘Not valid for night flying.’*

10.1.2 If the applicant passes both the day and night components of the OCVA, and they have no other relevant aeromedical conditions, they will have restrictions on their medical certificate reduced to –

> *'Not valid for flight in the vicinity of a controlled aerodrome unless the aircraft is in radio contact with aerodrome control.'*

10.1.3 The OCVA involves a practical check of an individual's colour vision in the operational aviation environment on the ground and during flight. The assessment is to be carried out by an 'A' Category flying instructor/examiner who has received CAA training in the procedures and conduct of the OCVA and is operating within an organisation holding a Part 141 certificate. The day component of OCVA will be undertaken in daylight, while the night component will be undertaken at night. The practical component of the day and night assessment must be carried out in an actual aircraft; a simulator, regardless of certification standard or approvals, cannot be used for the OCVA. The applicant will be required to demonstrate the ability to:

a) Read and correctly interpret in a timely manner aeronautical charts, including print in various sizes, colours and fonts as well as symbols, lines and terrain markings.

b) Read and correctly interpret in a timely manner aircraft instrumentation and displays.

c) Recognise terrain and obstructions in a timely manner.

d) At night, visually identify in a timely manner the location and significance of aeronautical lights including those associated with other aircraft and airfields.

10.1.4 As the OCVA requires the applicant to demonstrate satisfactory performance in aviation-related operational activities, it is desirable that the applicant has some aviation experience before undertaking the test. It is therefore best undertaken part way through training, probably at or about the point where a pilot would normally undertake the PPL flight test or have some night flying experience prior to completing a night rating. However, it is the applicant's responsibility to decide at what stage they undertake the OCVA. If the applicant undertakes an OCVA before starting, or early within their flight training, it is recommended they seek the advice of an A or B category instructor as to when the assessment should be completed. The OCVA is a stand-alone assessment and cannot be combined with other flight testing activities such as the issue or renewal of a flight crew licence, the issue or renewal of a flight crew rating, initial or periodic flight crew competency tests or operational checks, or Biennial Flight reviews.

10.1.5 Guidance for applicants and instructors undertaking or administering the CVD assessment process is at Annex A to Schedule 13 of this GD, and includes Appendices 1, 2, and 3.

10.2 Period of validity of results

10.2.1 The results of an OCVA are valid for an indefinite period unless there is any clinical suggestion that the applicant's colour vision deficiency may have changed. There is no limit on the number of times the OCVA may be taken.

Annex A to Schedule 13 of the Civil Aviation (Examination Procedures) General Directions Notice - Operational Colour Vision Assessment Guidance for Candidates

Background to colour vision deficiency

Colour Vision Deficiency (CVD) is a condition that results in individuals being unable to distinguish differences between certain colours. The condition is most commonly inherited, affecting approximately 8% of men and 0.5% of women.

A continuum exists in the severity of CVD. At the most benign end of the continuum an individual may have near normal colour vision. At the opposite extreme, an individual may be monochromatic: the latter is extremely rare. Whilst CVD is most usually inherited, it may also be acquired as a result of some medical conditions such as diabetes or eye de-generation.

CAA approach to colour vision deficiency

The CAA approach to assessing CVD pilots is one that constitutes both medical assessment and practical competency assessment in a 3-stage process. A flow chart depicting this process is at Appendix 1.

Pilots with the mildest forms of CVD, as assessed by clinical testing, are eligible for unrestricted medical certification in New Zealand. Those with more severe CVD, may still fly but with restrictions on their medical certificate that prevents them operating to and from controlled aerodromes without a radio, flying at night or carrying passengers on air operations. The last two restrictions may be removed by passing an operational flight assessment. The first cannot be removed because, without a radio, the control tower may use colour light signals to communicate with aircraft in an emergency; misinterpretation due to CVD could therefore constitute a safety risk.

Stage 1 - Screening for colour vision deficiency

The first stage of the colour vision screening test used in New Zealand is the Ishihara Pseudo-Isochromatic Plate test. This is a booklet of coloured plates where applicants are tested by being asked to identify a number or pattern on each page.

In most cases colour vision is only tested once, for initial issue of a medical certificate. It is possible for it to need to be tested again, especially if something changes, but this is very unusual. The pass criteria for the Ishihara assessment differs between the different types of Ishihara test. Passing the Ishihara test means that the applicant meets the colour vision standard.

Stage 2 - Alternative clinical colour vision tests

Someone who has failed the Ishihara screening test could be issued with a restricted medical certificate without further investigation, but further testing can be carried out to identify the nature and severity of the applicant’s colour vision deficit. This may be achieved through a second stage of testing using the Holmes Wright lantern, Farnsworth lantern, CAD test or Farnsworth D15 test. If any one of these second stage tests is passed, the candidate will receive an unrestricted medical certificate. Otherwise, the candidate will receive a medical certificate which includes restrictions that prevent them operating to and from controlled aerodromes without a radio, flying at night or working in air operations with passengers.

Stage 3 - Operational colour vision assessment

Noting that the listed clinical tests are conservative in nature and hence are difficult to pass with anything more than mild colour vision deficiency, in stage 3 of the testing the applicant may seek to have the restrictions against night flying and working in air operations with passengers removed by undertaking an operational colour vision assessment (OCVA). This consists of a ground and flight assessment, in which the candidate must demonstrate the ability to read and interpret charts, instrumentation, displays, aeronautical lighting, and terrain and conditions. The assessment is carried out initially by day and may be repeated at night for those candidates wishing to remove the night limitation.

As this is a flight assessment, it is desirable that applicants have some experience in piloting aircraft. It is therefore best undertaken part way through training, probably at or near the point where a pilot would normally undertake the PPL flight test or have some night flying experience prior to completing a night rating. Advice on when the assessment should be undertaken should best be made in consultation with an A or B Cat flight instructor, with the final decision on timing to be made by the candidate. Prior to the commencement of an assessment the applicant must produce evidence of their identity.

The applicant may choose to undertake the assessment in the day time only or during the day time and night time. The day OCVA must be completed before the night assessment. If the applicant passes the day time component of the OCVA, they will be permitted to undertake air operations with passengers (if appropriately licenced) and will have restrictions on their medical certificate reduced to –

> '*Not valid for flight in the vicinity of a controlled aerodrome unless the aircraft is in radio contact with aerodrome control.'*
>
> *'Not valid for night flying.'*

If the applicant passes both the day and night time component of the OCVA, they will be permitted to undertake air operations with passengers and to fly at night (if appropriately licenced and rated) and will have restrictions on their medical certificate reduced to –

> *'Not valid for flight in the vicinity of a controlled aerodrome unless the aircraft is in radio contact with aerodrome control.'*

Conduct of operational colour vision assessment

The assessment is to be carried out by an 'A' Category flying instructor/examiner who has received CAA training in the procedures and conduct of the OCVA, and is operating within an organisation holding a Part 141 certificate. The OCVA is to be conducted during the day time if the applicant seeks only the privilege to carry passengers on air operations by day. The OCVA must be repeated or extended into the night if the applicant seeks a night flying privilege.

The assessment must be conducted independently and cannot be combined with other flight testing/assessment activities such as the issue or renewal of a flight crew licence, the issue or renewal of a flight crew rating, initial or periodic flight crew competency tests or operational checks, and Biennial Flight reviews. The airborne element of the assessment by day and night must be flown in an aircraft; the use of a simulator, regardless of its certification or approval, is not permitted. The day and night OCVA must be conducted at an airport certified under Civil Aviation Rule Part 139. The night assessment must be completed at an airport where a fully representative range of permanent runway, taxiway and ground lighting is available.

In the day time, the applicant is required to:

- Read and correctly interpret in a timely manner aeronautical charts, including print in various sizes, colours and fonts, symbols, lines and terrain markings. Aeronautical chart reading may be performed in daylight or artificial light conditions where the chart would normally be read.

- Read and correctly interpret in a timely manner aircraft instrumentation and displays, particularly those with coloured markings, warning lights and coloured displays.

- Recognise terrain and obstructions in a timely manner including the surface condition of several emergency landing fields. The applicant should be able to describe surface features and obstructions.

During the transition to night, and at night, the applicant is required to:

- Read and correctly interpret in a timely manner aeronautical charts, including print in various sizes, colours and fonts, symbols, lines and terrain markings. Aeronautical chart reading may be performed under any light conditions where the chart would normally be read.

- Read and correctly interpret in a timely manner aircraft instrumentation and displays, particularly those with coloured markings, warning lights and coloured displays.

- Visually identify in a timely manner the location and significance of lights on other aircraft or airfields. This includes:

    - The location and direction of travel of other aircraft in the vicinity.
    - Runway approach aids relevant to the type of aircraft.
    - Runway edge.
    - Runway ends.
    - In runway lights (centreline, touchdown zone, taxiway lead off lights).
    - Taxiways.
    - Holding points.
    - Obstacles.
    - Airport beacons.

In all cases, the objective is not to name colours but rather to correctly interpret the meaning of information conveyed by charts, instruments or lights, or to assess terrain conditions or obstructions. The assessment is not a check of aviation knowledge or flying ability; for example, the use of keys, notes and glossaries on maps, charts and plates is permitted.

There is no requirement to interpret signals from a signal light or gun as all applicants will retain a restriction on their medical certificate of:

‘Not valid for flight in the vicinity of a controlled aerodrome unless the aircraft is in radio contact with aerodrome control.’

Result of the OCVA

The flight assessor is to assess the applicant’s ability to reliably undertake all listed tasks for their type of aircraft in either the day time or at night. The candidate must achieve a satisfactory assessment in all elements of the OCVA.

An inability to undertake the listed day time tasks would indicate that the applicant should not be afforded air operations with passenger privileges. An inability to undertake the listed night time tasks would indicate that the applicant should not be afforded night flying privileges.

Reporting requirements of the flight assessor

The results of the OCVA must be reported on the form at Appendix 2. At the conclusion of the assessment, the assessor must sign an entry in the applicant's logbook as follows:

> *'Operational colour vision assessment completed on [date]. Satisfactory performance in day operations demonstrated/not demonstrated* to allow air operations with passengers when appropriately licenced. Satisfactory performance in night flying demonstrated/not demonstrated/not undertaken* to allow night flying, when appropriately rated.*
>
> *Signed: Name: Inst Cat: CAA Nos: '*
>
> *(* Delete as required)*

Provide a copy of the completed OCVA form to the applicant to forward to their medical examiner for action.

Reporting requirements of the medical examiner

If sections 13-15 of OCVA form indicate a satisfactory performance by the applicant only in day time operations, and subject to the applicant having no other relevant medical conditions, it is appropriate for the AME to amend the applicant's medical certificate restrictions to:

> *'Not valid for flight in the vicinity of a controlled aerodrome unless the aircraft is in radio contact with aerodrome control.'*
>
> *'Not valid for night flying.'*

If sections 13-15 of the OCVA form indicate a satisfactory performance by the applicant in both day and night time operations, and subject to the applicant having no other relevant medical conditions, it is appropriate for the AME to amend the applicant's medical certificate restrictions to read:

> *'Not valid for flight in the vicinity of a controlled aerodrome unless the aircraft is in radio contact with aerodrome control.'*

In both the cases above the revised medical certificate should be re-issued to the applicant.

The medical examiner is to forward a copy of the amended medical certificate and the completed OCVA form to the CAA Aviation Medicine Team, CAA, PO Box 3555, Wellington 6140.

Period of validity of results

The results of an OCVA are valid for an indefinite period. Multiple attempts at the OCVA are permitted. A pilot is responsible for reporting any perceived, or clinically confirmed changes in their colour vision deficiency to the CAA medical staff.

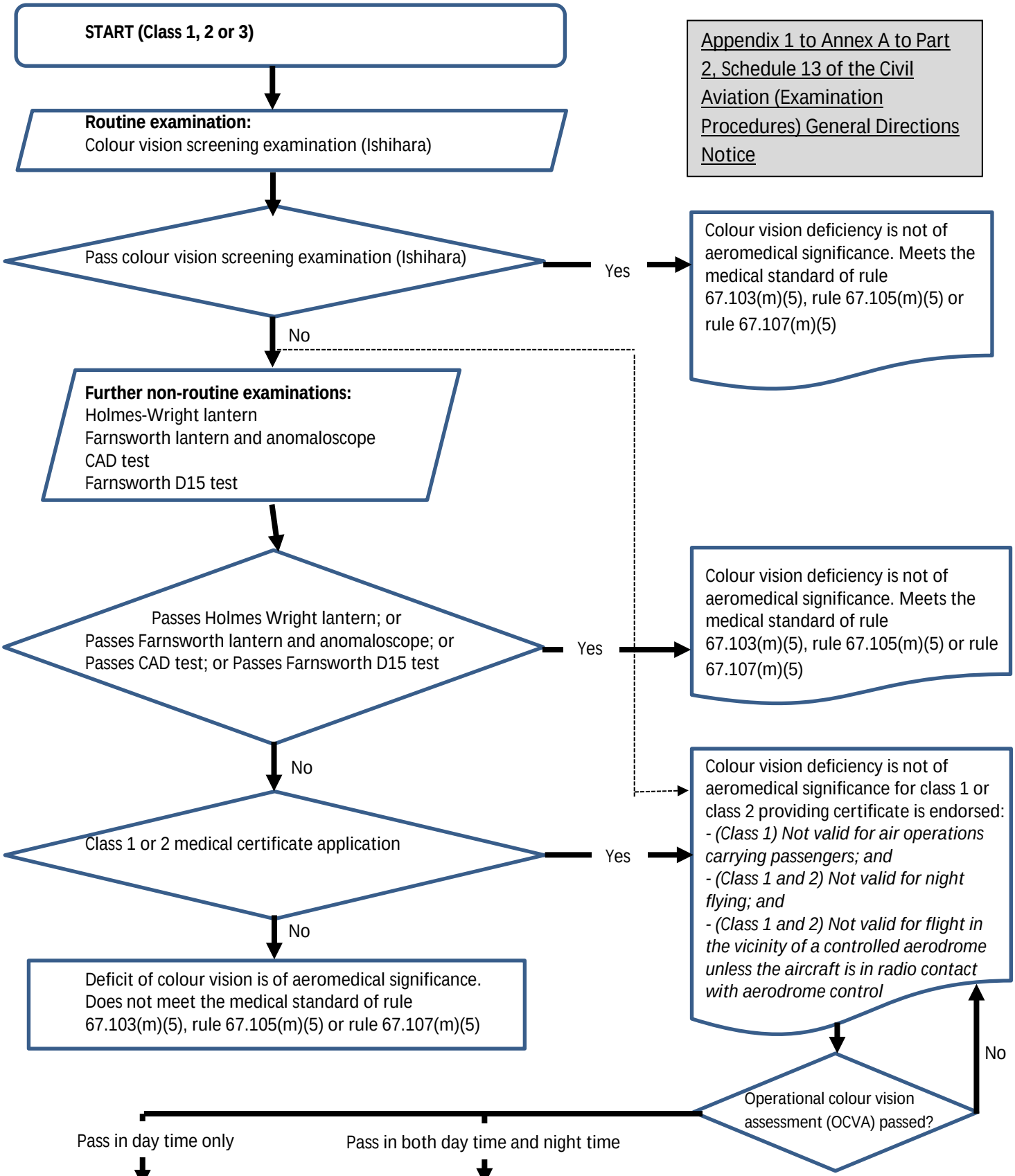
Risk of pilots flying with a colour vision deficiency

Empirical and clinical evidence indicates that applicants with CVD are able to operate safely provided they have successfully completed the applicable level of training and testing to demonstrate their competence and comply with any restrictions imposed.

Foreign pilots seeking certification in New Zealand

New Zealand's colour vision standards may be different to other countries who may issue unrestricted medical certificates to some colour vision defective applicants that New Zealand would not.

Foreign applicants seeking medical certification in New Zealand must have their colour vision assessed according to the New Zealand CAA medical standards and procedures. It is possible this assessment may have a different outcome to one completed under another country's jurisdiction.



Appendix 1 to Annex A to Part 2, Schedule 13 of the Civil Aviation (Examination Procedures) General Directions Notice

Appendix 2 to Annex A - OPERATIONAL COLOUR VISION ASSESSMENT FORM

1. Applicant's Name:		**2. CAA Client Nos:**	
3. Postal Address:		**4. Date of Birth:**	
		5. Email:	
6. Licence Held:		**7. Experience (hours)**	
8. Medical certificate(s) applied for: Class 1 Class 2 DL9		**9. Applicant's Signature:**	
10. Aircraft type: **Registration:**		**11. Corrective lenses used?** Yes/No	

12. Assessment flight details:

a. Airport of departure/other airfields used:
b. Route:
c. Duration - Ground: Air:
d. Weather:

13. Satisfactory/safe performance in day light:	Yes	No	Comments
a. On the ground and in the air, read and correctly interpret in a timely manner aeronautical maps, chart and plates, including print in various sizes, colours and fonts, symbols, lines and terrain markings. Aeronautical chart reading may be performed in daylight or under any light conditions where the chart would normally be read.			
b. On the ground and in the air, read and correctly interpret in a timely manner aircraft instrumentation and displays, particularly those with coloured markings, warning lights and coloured displays.			
c. In the air, recognise terrain and obstructions in a timely manner including the surface condition of several emergency landing fields. The applicant should be able to describe surface features and obstructions.			

14. Satisfactory/safe performance at night:	Yes	No	Comment
a. On the ground and in the air, read and correctly interpret in a timely manner aeronautical charts, including print in various sizes, colours and fonts, symbols, lines and terrain markings. Aeronautical chart reading may be performed under any light conditions where the chart would normally be read.			
b. On the ground and in the air, read and correctly interpret in a timely manner aircraft instrumentation and displays, particularly those with coloured markings, warning lights and coloured displays.			
c. Visually identify in a timely manner on the ground and in the air the location and significance of lights on an airfield or other aircraft. This may include: - Identifying the location and direction of travel of other aircraft in the vicinity. - Runway approach aids relevant to the type of aircraft. - Runway edge. - Runway ends. - In runway lights (centreline, touchdown zone, taxiway lead off lights). - Taxiways. - Holding points. - Obstacles. - Airport beacons.			

15. Summary of performance:		
Satisfactory performance in day time operations to allow removal of medical restrictions relating to the carriage of passengers on air transport operations?	**Yes**	**No**
Satisfactory performance in night time operations to allow removal of restrictions concerning night flying?	**Yes**	**No**

16. Additional information/notes:

17. Instructor Organisation and Address:	**18. Instructor Name:** **Inst Cat:** **CAA Nos:**
Telephone:	**19. Instructor declaration:** I hereby certify that I have personally identified and assessed the applicant named on this report and that this report, and any attached notes, embodies my examination correctly. **Signature:** **Date:**

Appendix 3 to Annex A - Guidance Notes for the Instructor Completing an Operational Colour Vision Assessment

The operational colour vision assessment (OCVA) is to be carried out by an 'A' Category flying instructor/examiner who has received CAA training in the procedures and conduct of the OCVA and is operating within an organisation holding a Part 141 certificate. It is recommended that applicants have some experience in piloting aircraft before taking the assessment, probably at or near the point at which they would normally undertake the PPL flight test (day assessment) or have completed some dual night flying (night assessment). Applicants are advised to seek the guidance of an A or B Cat instructor as to when to take the assessment. Flight examiners carrying out the OCVA should confirm that the applicant has done this; however, it is the applicant's decision on when to take the OCVA. There is no restriction on how many times the applicant may undertake the OCVA. Assessors should ascertain if an applicant has undergone previous assessments and may question the applicant as to what areas of the assessment were previously found to be unsatisfactory, and what remedial training the applicant has completed (if any). The applicant's identity should be confirmed by appropriate photo-ID and the signature of the applicant is to be recorded on the assessment form.

The OCVA must be conducted independently and cannot be combined with other flight testing or assessment activity, such as the issue or renewal of a flight crew licence, the issue or renewal of a flight crew rating, initial or periodic flight crew competency checks, operational checks or biennial flight reviews. The airborne element of the assessment by day and night must be flown in an aircraft; the use of a simulator, regardless of its certification or approval, is not permitted. The day OCVA may be conducted in daylight and under artificial lighting conditions where a chart/map/plate would normally be read. The day OCVA must be completed before the night OCVA. The night OCVA must be completed at night (between ECT and MCT); ground assessment may be done under any light conditions where a chart/map/plate would be read, and under normal cockpit lighting. The OCVA may be flown as a day-into-night exercise provided the night section is completed in full darkness. Both the day and night OCVA must be carried out from an airfield certified under CAR Part 139. The night OCVA must be conducted at an airport where a fully representative range of permanent runway, taxiway and aerodrome lighting is available; assessment of other aircraft operating on the ground and in the air is required as part of the night OCVA.

The assessment must cover all of the areas defined in the OCVA form. The objective of the assessment is not to determine if the applicant can name colours and is not an assessment of flying ability. The instructor carrying out the assessment should confirm that an applicant can correctly and consistently interpret the meaning of information conveyed by maps, charts, plates, instruments or lights, or to assess terrain conditions and obstructions on the ground and in the air. The assessment is not a check of aviation knowledge. For example, the use of keys, notes and glossaries on maps, charts and plates is permitted; the interpretation of warning lights should recognise the nature of the warning, not the actions or drills associated with it. Where lighting is observed, the applicant should be able to recognise it in a way that allows its function to be clearly stated and appropriate action taken. In the air, assessing instructors must analyse whether an applicant's action, say an unstable or unsafe approach, is due to lack of ability or as a result of misinterpreting visual cues (e.g. surface features, PAPIs, or runway lighting). This should be achieved through questioning what the applicant is seeing and how they are reacting to this information. Manoeuvres can be repeated as necessary to confirm assessments. Correct interpretation should be achieved by the candidate in 'reasonable time'. This is defined as the amount of time appropriate to the given operational assessment scenario to identify

correctly, trap and/or action a visual cue such that safety is not compromised. 'Reasonable time' on the ground in a planning scenario will differ from that say of identifying and actioning lights on an aircraft approach.

Once the day or night OCVA is completed, the instructor should fill out the relevant sections of the OCVA assessment form. An applicant must achieve a 'satisfactory' assessment in **all** the categories in sections 13 and 14 to be deemed to have an overall satisfactory performance in section 15. Where the assessment has been unsatisfactory, detail should be included in the report for both the applicant's and the medical examiner's information. The assessor should debrief the applicant on the specific areas of unsatisfactory performance.

At the conclusion of the assessment, the assessor should complete and sign an entry in the applicant's logbook as follows:

> *'Operational colour vision assessment completed on [date]. Satisfactory performance in day operations demonstrated/not demonstrated* to allow air operations with passengers when appropriately licenced. Satisfactory performance in night flying demonstrated/not demonstrated/not undertaken* to allow night flying, when appropriately rated.*
>
> *Signed: Name: Inst Cat: CAA Nos: '*
>
> *(*Delete as required)*

Provide a completed copy of the form to the applicant to pass to their aviation medical examiner so the doctor can review the applicant's medical certificate. Also, forward a copy of the form to the CAA Aviation Medicine Team, CAA, PO Box 3555, Wellington 6140.

III. Consequential amendments to other Documents

1. Civil Aviation Advisory Circular AC 61-20

The paragraph regarding colour vision in **AC 61-20**, entitled "Rule 61.357(b)(4)(iv) Colour Vision" is amended as highlighted below:

Rule 61.357(b)(4)(iv) Colour Vision

A pass in the Ishihara colour vision screening examination is acceptable to the Director for the holder of an RPL to operate into or out of a controlled aerodrome. A pilot who fails the Ishihara colour vision screen examination but has a pass in any of the non-routine colour vision tests as described in Schedule 13 of the Civil Aviation (Examination Procedures) General Directions (GD) Notice is acceptable to the Director for the holder of an RPL to operate into or out of a controlled aerodrome.

A pilot who fails the Ishihara colour vision screening examination and does not undertake any further colour vision testing, or who fails further non-routine colour vision testing as described in Schedule 13 of the Civil Aviation (Examination Procedures) General Directions Notice may not operate in and out of a controlled aerodrome unless the aircraft is in radio contact with aerodrome control.

2. Civil Aviation Authority Medical Information Sheet 006

CAA MIS 006 to be updated as revision 2 as per below:

CAA Colour Vision Deficiency - MIS 006

What is colour vision deficiency?

Colour Vision Deficiency (CVD) is a condition that results in individuals being unable to distinguish differences between certain colours. The condition is most commonly inherited, affecting approximately 8% of men and a smaller proportion (0.5%) of women.

A continuum exists in the severity of CVD. At the most benign end of the continuum an individual may have near normal colour vision. At the opposite extreme, an individual may be monochromatic: the latter is extremely rare.

A greater proportion of the male population is affected as congenital CVD is genetically transferred on the X chromosome. Symptoms only become apparent when the full complement of X chromosomes is affected. Males have only a single X chromosome and so have a greater probability of developing symptoms than females.

CVD may also be acquired as a result of some medical conditions such as diabetes, some drugs or eye degeneration or surgery.

How is colour vision tested?

The colour vision screening test used in New Zealand is the Ishihara Pseudo-Isochromatic Plate test. This is a booklet of coloured plates where applicants are tested by being asked to identify a number or pattern on each page.

In most cases colour vision is only tested the first time you apply for a medical certificate. It is possible for it to need to be tested again, especially if something changes, but this is very unusual. The pass criteria for the Ishihara test differ between the different types of Ishihara test.

Passing the Ishihara test means that you meet the colour vision standard. Unless there is some other medical problem, you can expect to be issued a medical certificate and are unlikely to be tested again.

If you fail the Ishihara screening test it may mean that you have CVD. Failing the Ishihara test doesn't provide any detailed information about the nature and severity of a colour vision deficit, further testing is needed to do that.

Someone who has failed the Ishihara screening test could be issued with a restricted medical certificate without further investigation, but usually further information is sought to identify the nature and severity of the applicant's colour vision deficit. This may be achieved using the Holmes Wright lantern, Farnsworth lantern, CAD test or Farnsworth D15 test. If any one of these tests is passed the candidate will receive an unrestricted medical certificate. Otherwise, the candidate will receive a medical certificate which includes a restriction that prevents them operating to and from controlled aerodromes without a radio, flying at night or working in air operations with passengers.

The applicant may then seek to have the restrictions against night flying and working in air operations with passengers removed by undertaking an operational colour vision assessment – essentially an assessment of the applicant's ability to interpret colour related matters in an aviation context. They must demonstrate their ability to read and interpret charts, instrumentation, displays and aeronautical lighting. This assessment is about colour related interpretation in an aviation context, and some aviation knowledge and experience is likely to be advantageous: the timing of the assessment is therefore appropriately determined with consultation by the applicant with an A or B category flight instructor. As a guide, it is considered that an applicant's aviation experience level just prior to, or just after the award of the PPL would be appropriate. This does not preclude a candidate completing assessments before or after this point. For the night OCVA it would be considered essential that the applicant has some practical experience of the night aviation environment. The OCVA is a stand-alone assessment and cannot be combined with other aviation flight tests, competency checks or renewals. The practical element of the assessment must be carried out in an actual aircraft; the use of a simulator, regardless of certification standard and approval is not permitted. The OCVA will be carried out by a number of A or B Cat flight instructors who have received OCVA assessor training and who are operating under a Part 141 certified organisation. Further information can be found in the Civil Aviation (Colour Vision Deficiency) General Direction Notice 2018 (link) and Civil Aviation (Examination Procedures) General Direction Notice (link).

Can colour vision deficient pilots fly in New Zealand?

The CAA NZ approach to assessing CVD pilots is one that constitutes both medical assessment and practical competency assessment.

Pilots with the mildest forms of CVD are eligible for unrestricted medical certification in New Zealand. Those with more severe CVD, but who pass an operational colour vision assessment, may still fly but with a restriction that prevents them operating to and from controlled aerodromes without a radio. This is necessary because, without a radio, the control tower may use colour light signals to communicate with the aircraft.

Is there a risk in starting pilot training with CVD?

All pilots, once they have their medical, must progress through a programme of training, examinations and practical flight tests. The training and flight tests are tailored to the nature of flying that an individual will undertake. For example, a student first trains and is then tested for private pilot privileges. They may then progress onwards through training and testing for night flying privileges, commercial pilot privileges, flight in instrument meteorological conditions, specific aircraft type ratings and so on.

For every person that starts pilot training there is a risk that they will not progress beyond a certain level. For some this is a choice, while for others it may be because of medical conditions that arise, aptitude, or other reasons. Empirical and clinical evidence indicates that applicants with CVD are able to operate safely provided they have successfully completed the applicable level of training and testing to demonstrate their competence and comply with any restrictions imposed.

In New Zealand and other parts of the world, pilots with CVD operate in all areas of aviation such as aeroplane and helicopter flight instruction, general aviation and airline operations. Their ability to safely and competently function in various roles reflects the potential opportunity for those with CVD.

If you are concerned about the impact of your CVD on your ability to operate the aircraft safely and progress through the flight training system, then it is recommended that you discuss your condition with your flying instructors and flight examiners who can then identify any concerns early in your flying career.

Are colour vision standards the same in every country?

There are international medical standards for the colour vision of pilots. The international medical standards require the ability to perceive readily those colours the perception of which is necessary for the safe performance of duties.

Different countries apply those international medical standards in slightly different ways. While New Zealand's colour vision standards are amongst the most accommodating in the world there are countries who may issue unrestricted medical certificates to some colour vision defective applicants that New Zealand would not.

I already have a medical certificate from another country?

You will still need to have your colour vision assessed according to the New Zealand standards and procedures if you apply for medical certification in NZ. If you have CVD it is possible that your New Zealand CAA application will have a different outcome to your overseas assessment.

General Directions Consultation Response Sheet

Colour Vision Deficiency GD/CVD/2018.1

Please return this response sheet by the due date to the Consultation Coordinator:

Email - Consultation@caa.govt.nz; Post – PO Box 3555, Wellington, 6140.

Please answer the following questions and indicate your acceptance or otherwise of the proposal by ticking [X] in the appropriate box below. Any additional constructive comments, suggested amendments or alternative action will be welcome and may be provided on this response sheet or by separate correspondence.

How will this proposed general direction impact you?

[ ] The proposal is acceptable without change.

[ ] The proposal is acceptable but would be improved if the following changes were made:

[ ] The proposal is not acceptable but would be acceptable if the following changes were made: (Please provide explanatory comment and use additional pages if required)

[ ] The proposal is <u>not acceptable under any circumstance:</u>
(Explanatory comment must be provided using additional pages if required)

Your name, organisation, client number, and address, phone, facsimile, and e-mail:

Date: _____

Number of pages attached [ ]