COLOUR VISION DEFECTIVE PILOTS ASSOCIATION

An aviation career is NOT impossible!

Get the Facts!
www.cvdpa.com
OVERVIEW OF PRESENTATION

Summarise the main types of defective colour vision

Highlight current differences across ‘The Ditch’ in aviation regulations about colour vision

Outline decisions by Australian appeals tribunals underpinning these differences in regulations

Discuss some of the implications of these tribunal decisions for aviation in New Zealand
SEEING COLOURS

Seeing begins with receptors for light in the retina of the eye.

Colour vision depends on receptors called ‘cones’.

‘Red’ cones respond best to long wavelength light (‘Prot’ = First)

‘Green’ cones respond best to medium wavelength light (‘Deut’ = Second)

‘Blue’ cones respond best to short wavelength light (‘Trit’ = Third)
Figure 2  Normalised spectral sensitivity of the four receptor types found in the human retina (from Stockman et al, 1999; Stockman and Sharpe, 2000).
CONGENITAL DEFECTIVE COLOUR VISION

Suffixes: (....anopia) versus (....anomaly)

Protanopia (no red cones)
Protanomaly (defective red cones)

Deuteranopia (no green cones)
Deuteranomaly (defective green cones)

Tritanopia (no blue cones)
Tritanomaly (defective blue cones)
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<th>Australia</th>
<th>New Zealand</th>
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<tr>
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<td>Restricted</td>
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<tr>
<td>CPL</td>
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<td>ATPL</td>
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A DEMONSTRATION OF THESE DIFFERENCES

Captain ‘X’ is a deuteranope with an Australian ATPL and an unrestricted medical certificate who captains a Airbus A330. It could be any large RPT aircraft.

He is able to fly from Australia to any international destination, including airports in New Zealand.

All Australian airlines employ pilots such as Captain ‘X’ who undergo training, testing and assessment identical to that of their peers with normal colour vision.
HOW DID THESE DIFFERENCES COME ABOUT?

Australian citizens can appeal decisions made by agencies such as the Civil Aviation Safety Authority (CASA)

The Administrative Appeals Tribunal of Australia (AATA), an independent body, a branch of the Federal Court of Australia, hears appeals on a wide range of regulatory decisions, including those involving aviation.

The AAT has the power review the evidence on which a decision being appealed was based, and if appropriate, vary or reverse this decision.
TWO PIVOTAL REVIEWS

Re Arthur Marius Pape and Secretary, Department of Aviation [1987] AATA 354
(9 October 1987)

Re Hugh Jonathan Denison and Civil Aviation Authority [1989] AATA 84; 10 AAR 242
(7 April 1989)
THE EVIDENCE

Pilots acquire information that determines action and behaviour from many sources.

The information content of colour is very limited, rarely more than cosmetic.

CVD pilots’ actions and behaviours are the same as for colour normal pilots.

The accident/incident data for colour defectives is in line with that for colour normals.
THE DECISION:

The ‘Information’ value of ‘Colour’ is of small significance in aviation usage.

Colour vision defects, per-se, pose no threat to safety of air navigation.

Restrictions on CVD pilots to be removed.
IMPLICATIONS FOR NEW ZEALAND

Regulatory standards that selectively restrict career opportunities to citizens should be based on valid and compelling evidence. This requirement should be fundamental in ‘free’ societies.

The Australian AAT appears to be unique, and has no counterpart in New Zealand. This may inhibit the achievement evidence-based regulations.

Meanwhile, the flow of New Zealand’s CVD pilots across “The Ditch” will continue.
THANK YOU!

Questions?

For a far more comprehensive coverage of the entire topic, please visit www.cvdpa.com
Do you have defective colour vision?
(Or know somebody that does?)

It is likely you have been misinformed that an aviation career is impossible.

Get the Facts!
www.cvdpa.com
USE OF COLOUR IN AVIATION – Examples:

Colour in the cockpit

Colour out of the cockpit
ECAM DISPLAY FROM AIRBUS A330

Harmonising Colour Vision Regulations
IS COLOUR SUFFICIENT FOR ‘SEEING’ INFORMATION

Can you see this line is coloured blue?

Can you see the information presented in this line?
IS COLOUR NECESSARY FOR ‘SEEING’ INFORMATION

Can you see this line is not coloured?

Can you see the information presented in this line?
THE ‘CRAPPY’ PAPI
THE ‘CRAPPY’ PAPI

PAPI: A Pilot's eye view

- Too High
- Slightly High
- On Glide Path
- Slightly Low
- Too Low

On Glide Path
THE ‘CRAPPY’ PAPI

Only offers a **single aim-point** which suits the largest aircraft regularly flying into that airport. Eg. A380
THE ‘CRAPPY’ PAPI

eg. If B737 were to fly two reds – two whites to touch down, it would land long

Requires approach to be ‘de-stabilised’ at some point (usually below about 300 ft) in order to touch down at correct point

In rural/bush areas, dust can cover lens covers causing all indications to appear PINK

Only visible 3.5 – 4 nm in daylight (T-VASIS = 10 – 12nm)

Only visible 6 – 8 nm at night (T-VASIS = 12 – 14nm)
THE ‘CRAPPY’ PAPI

Extract from Qantas B737 Manual:

VISUAL APPROACH SLOPE GUIDANCE

These include Visual Approach Slope Indicator System (VASIS), T-VASIS, Precision Approach Path Indicator (PAPI) or their variants.

All are guidance systems only and their continued use below 300 ft is secondary to a visual 3° approach path to a normal touchdown point for the aircraft type.
T-VASIS
T-VASIS

- Slightly High
- High
- Very High

- On Slope

- Should the aircraft descend below this angle, all the lights will be red.

- Slightly Low
- Low
- Very Low
T-VASIS

Offers 7 aim-points in total (A, B, C, D, E, F, G)
T-VASIS

Offers 7 aim-points in total

One of these aim points will suit ANY aircraft

More ‘intuitive’ to fly. The upright or inverted ‘T’ gives immediate and obvious indication about whether to ‘fly up’ or ‘fly down’

Visible at a far greater distance on approach than PAPI
RECOMMENDATIONS

“...PAPI which uses colour as the primary signal code should not be used for routine operations by military aircraft in Australia.

It is suggested that Transport Australia should consider extension of this recommendation to civil aircraft routine operations in Australia and that representations should be made to ICAO to reject the use of red-white VASIS and PAPI in international air transport operations.”

Australian Department of Defence Systems Report 25
“Hazards of Colour Coding in Visual Approach Slope Indicators” Clarke & Gordon, 1981