

Recent research determining the CAD equivalence to lantern testing

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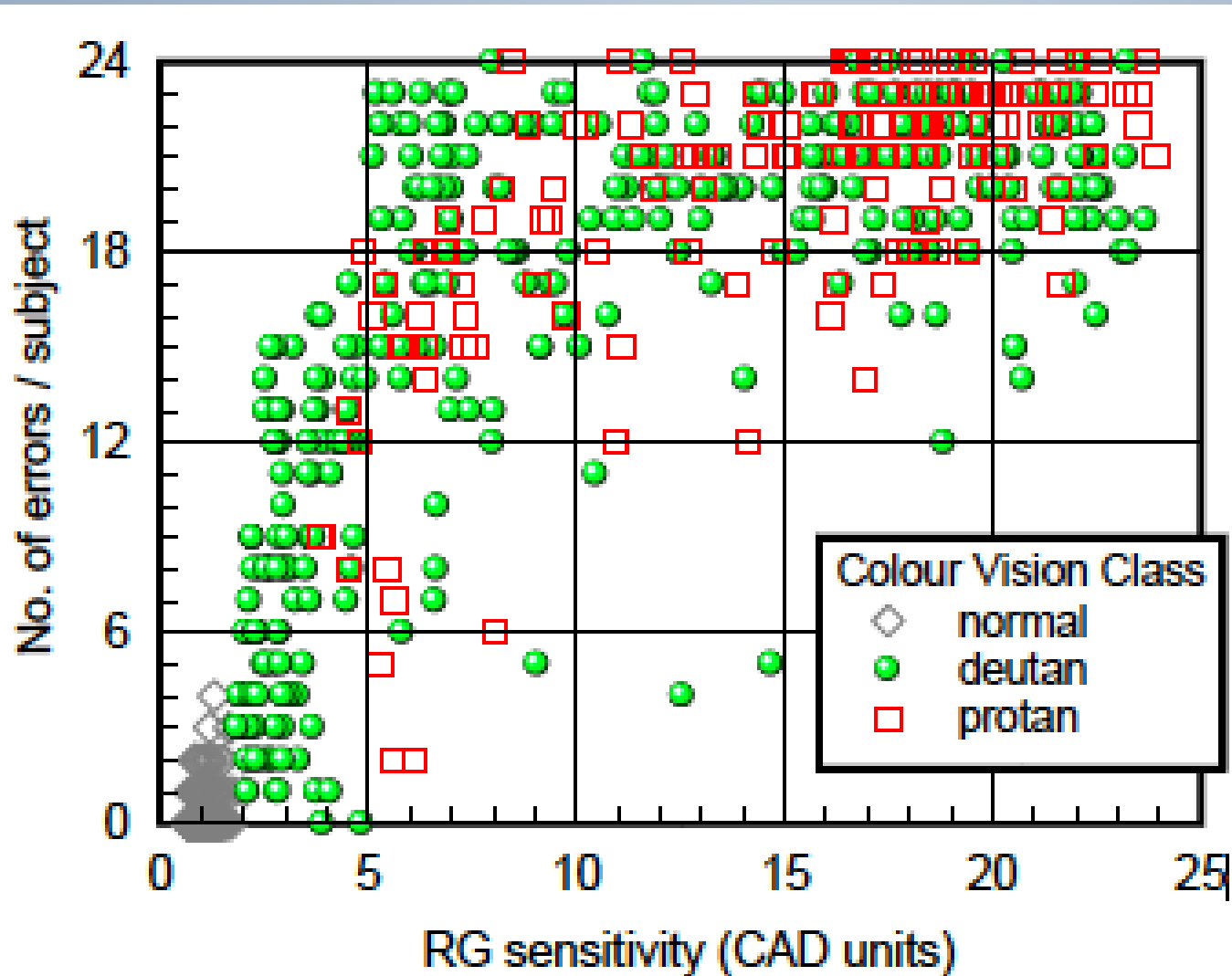
A very brief history

- Lantern test for deck officers from 1912. Rational basis for threshold of acceptability
- Ishihara plates for all deck crew with Holmes Wright B lantern as confirmatory test from 1960s
- Vision standards made mandatory internationally in IMO STCW Manila amendments 2010
- Holmes Wright lanterns unserviceable. IT based alternatives – Kobe workshop
- Failure to agree on updated risk evaluation or testing methods by IMO

A very small bit of vision science

- Number of Ishihara plates failed indicates probability of CV deficiency but does not reliably measure severity.
- Two relevant types of CV deficiency: Protanopia – Red, deutanopia – green. Severity of defect varies widely
- We do not know what level of deficiency is safety critical for maritime lookouts. (Aviation has studied and knows for pilots!)

Ishihara errors and CV deficiency



MCA commissioned report

**Colour vision assessment for
maritime navigational lookout:**

**review for UK Maritime and
Coastguard Agency (MCA)**

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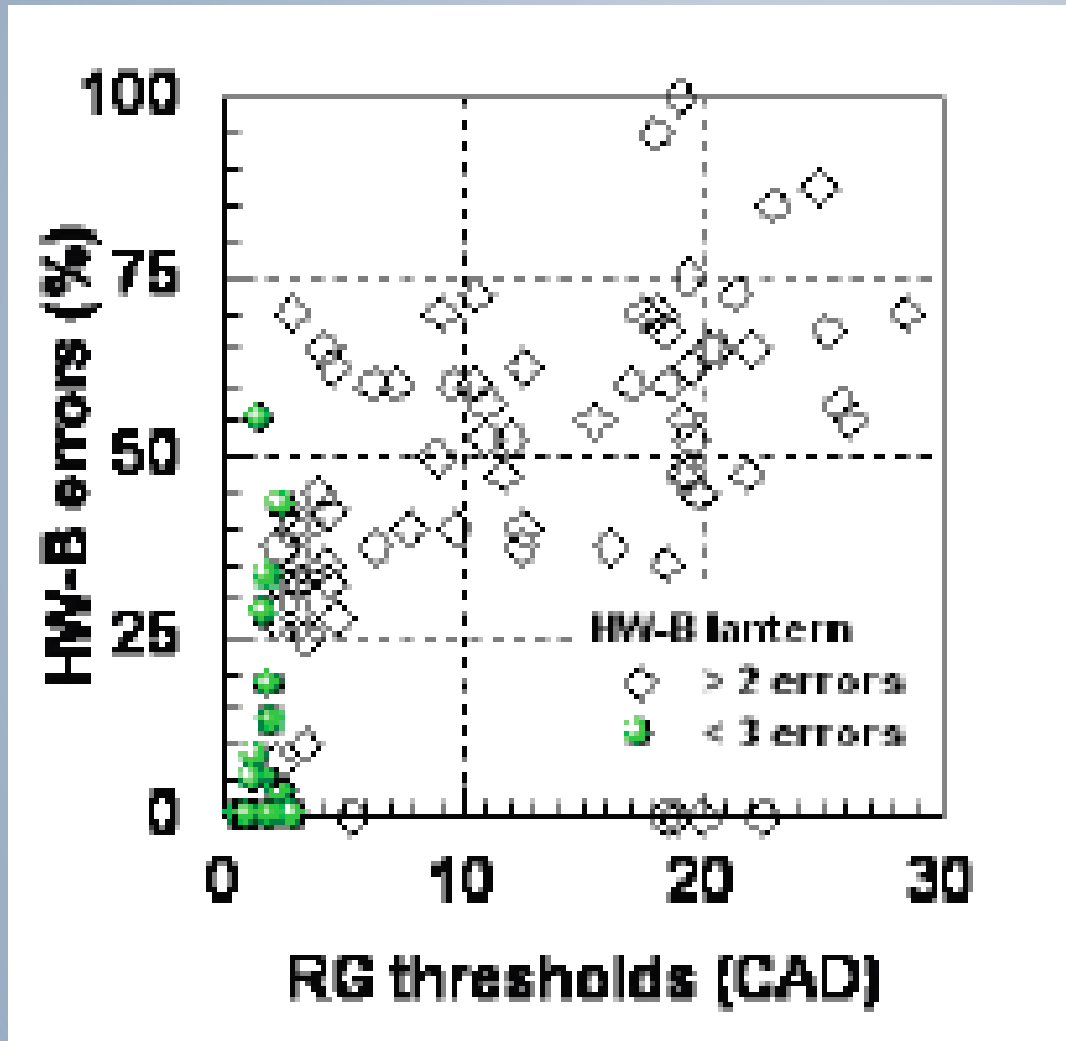
July 2015

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/527470/FINAL_report_Colour_vision_testing.pdf

Report summary

The recommended alternative (to the Holmes Wright B lantern) is the CAD (Colour Assessment and Diagnosis) test. This measures the severity and type of colour vision loss, and reliably detects congenital deficiency. When the upper pass threshold limit is set at 2.35 CAD units the test can provide a valid alternative to the current lantern test. An additional benefit would be a reduction in the number of seafarers with adequate colour vision now classified incorrectly as unfit.

Holmes Wright B/CAD comparisons



Most data on comparisons
Are between HW A
and CAD in aviation
But comparisons
Between HW A and
HW B available.

Summary

- CAD a valid replacement for HW B
- Limitations of Ishihara – why not CAD for all?
- Development of lower cost CAD screener
- Lack of information on present day visual requirements for lookout duties
- HW B to CAD change is based on threshold set using comparative studies of test performance
- International policy in a limbo!

NEXT what is CAD test like + experience in use