

Electrical Licensing Board

Guidelines

Guideline No.1 - Colour Confusion (Colour Blindness)

Introduction

“Roughly 1 in 10 men are fully or partially colour blind”. “--- men are at least 20 times more likely than women to develop colour blindness”.¹

The Electrical Licensing Board (the Board) is established under the *Electricity Industry Safety and Administration Act 1997* to assist the Regulator in the administration of the licensing scheme for electrical contractors and electrical technicians.² Over time it has also operated as a source of advice to the Electricity Standards and Safety Group, which administers the electrical licensing system on the behalf of the Delegate of the Regulator. Colour confusion within the electrical industry is an issue and was raised with the Board for consideration and advice.

Colour confusion (generally known as ‘colour blindness’) in the electrical industry has the potential to lead to dangerous situations, both for the electrical worker and for the consumer. From a licensing point of view, it raises questions regarding:

- the suitability of a candidate for work in the industry, and for the granting of an occupational licence
- the duty of care to ensure the promotion of safety for the electrical worker and general community when issuing a licence.

Following consideration of these questions from a Tasmanian and national licensing perspective, the Board has issued the following comments to help people already working in the industry and anyone considering entering the industry.

Assessment

There is wide variation in the degree of impairment and the colours involved. It has been shown that a person can still perform electrical work in a suitable and safe manner while possessing a certain degree of colour confusion. However, it is important that a reduced ability to discern colours be detected as early as possible in a person's career, in order to avoid unreal expectations.

Before starting training, all new electrical trainees should undertake a basic cable colour identification test for colour confusion, using the designated colours of red, green, green/yellow, black and light blue from *Table 3.5 Colours of Cable Cores* of

¹Article by Dr Alex Wade, Research Fellow at Stanford University “Can you tell red from green?”, Planet Medica, April 2000

² Further information on the Electrical Licensing Board may be found in the Board’s Annual Reports, available from the Office of Electrical Standards and Safety website (www.wst.tas.gov.au/electricity)

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AS/NZS 3000:2000 (Wiring Rules) (see below). If a colour deficiency is identified, the trainee must then attend a medical practitioner or certified optometrist for further tests to determine if the condition can be managed.

Initial tests can be a basic test to identify individual cable cores with the above colours. The test would need to be taken under controlled conditions such that the trainee is not able to work out by elimination or easily guess the correct colour e.g. not using a three-core cable stripped back to expose the inner cores. Separate sections of cable cores should be correctly identified individually and also when in close proximity to the other relevant colours. The Ishihara test is also recognised as being an acceptable test to initially establish a colour identification deficiency.

AS/NZS 3000:2000
Table 3.5
COLOURS OF CABLE CORES

Function	Identifying colours	
	Recommended	Alternative
Earth/bonding	Green/yellow	Green
Neutral	Black	Light blue
Active	Red	Any colour except green/yellow, green, yellow, black, light blue

Outcome

Should an impairment be detected in the colours critical in the industry (refer Australian standard AS/NZS3000:2000 table 3.5) an assessment should be made by a qualified person of the ability to manage the problem; for example by introducing improved lighting, use of a colour chart, comparison with known conductors or some other management system.

If a manageable outcome is available the trainee can be accepted into training, the condition and management method noted on the employee's training record and in the case of group training, all host employers notified. If no suitable outcome is available the trainee should be counselled to seek an alternative traineeship that does not have the same requirement.

A person unable to manage their colour confusion should not progress in the industry for safety reasons. It is also unlikely that such a person would be deemed competent in the relevant apprentice-training course.

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Licensing

In considering an application for a licence, the Regulator requires information about (among other things):

- the applicant's qualifications and experience in carrying out electrical work
- any other information relevant to the applicant's capacity and fitness to carry out electrical work of the relevant class or classes.

Information on colour confusion would be considered relevant to the applicant's capacity and fitness to carry out electrical work. However, where there is evidence that it has not affected their ability to perform work to the appropriate standard and level of safety, including under managed conditions, the condition would not automatically stop a successful licensing outcome.

Conclusion

Merit should govern the assessment and acceptance of all applications, both where applicants have no impairment, and where applicants have an impairment, which is manageable.

A manageable impairment would not be a reason for excluding an applicant or not assessing or accepting their application.

An impairment which prevents an applicant from carrying out an inherent requirement of the job and which is unmanageable is a basis on which an applicant can be excluded, or their application not be accepted.

It is strongly recommended that all proper efforts be made to ensure that an unmanageable condition is detected prior to a contract of apprenticeship, and that a person with an unmanageable condition be counseled to seek an alternative course that does not have an electrical technician licensing outcome. This will avoid a situation of a person having undertaken training only to find a licensing outcome unobtainable.

Employers have a responsibility to ensure that electrical workers can adequately perform the tasks assigned to them and that apprentices are able to achieve the contractual outcome intended.