CIE Australia 75th Anniversary

24th August 2023

Developments in interior and architectural lighting

Warren Julian

THE UNIVERSITY OF SYDNEY

I wanted to submit a paper to the 1975 CIE Session

- I was a lecturer at University of Sydney
- I was doing research on the lighting needs of the aged partially sighted
- I noticed a call for papers
- I air-mailed British CIE Cttee
- They said I had to contact the Australian National Committee on Illumination (ANCI)
- They gave me its address (at the NML)
- Where was it? About 150m from my office at University
- Contacted nice people but how do I join, etc?
- Very complicated, only national organisations had a vote: CSIRO, Federal agencies, national industry groups, etc. I could be an associate. Active researchers were basically observers. CIE was scientific but ANCI was mostly bureaucratic.

ANCI became democratic and was actively involved in CIE

- Australia was very active in CIE technical work:
  - Metrology
  - Road lighting
  - Discomfort glare
  - Lighting for partially sighted
  - Daylight (sky luminance distributions)
- Australia became active in CIE administration:
  - Dr Alec Fisher VP(Technical)
  - Dr Warren Julian VP(Publications), VP(Technical) and offered nomination as President but declined due to workload and cost to ANCI (by then CIE Australia)

Apologies for any omissions!

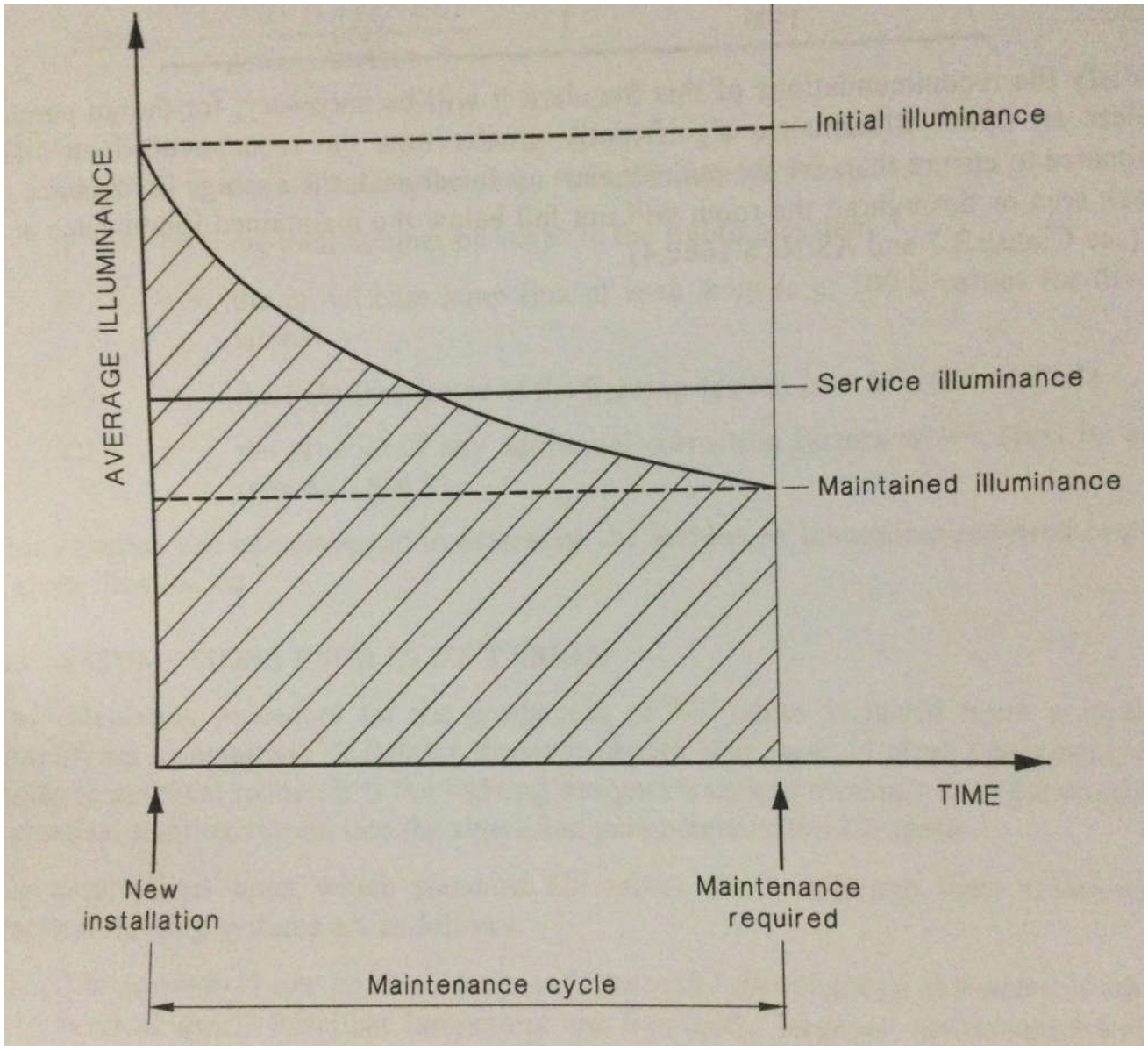
The CIE Unified Glare Rating (UGR)

- One of longest running interior lighting committees, due to squabbling over the format of the Technical Report (after a decade of arguments on contents). As VP(Technical), I got agreement from all sides that they would accept my editing, provided that I removed nothing.
- I shifted everything that wasn't strictly technical into a rather large appendix. It was published and now used in Standards.

$$UGR = 8\log\frac{0.25}{L_b}\sum\frac{L^2\omega}{p^2}$$

Lb	is the background luminance (cdm^{-2}),
L	is the luminance of the luminous parts of each luminaire in the direction of the observer's eye (cdm^{-2}),
ω	is the solid angle of the luminous parts of each luminaire at the observer's eye (sr), and
p	is the Guth position index for each luminaire (displacement from the line of sight).

Service and Maintained E



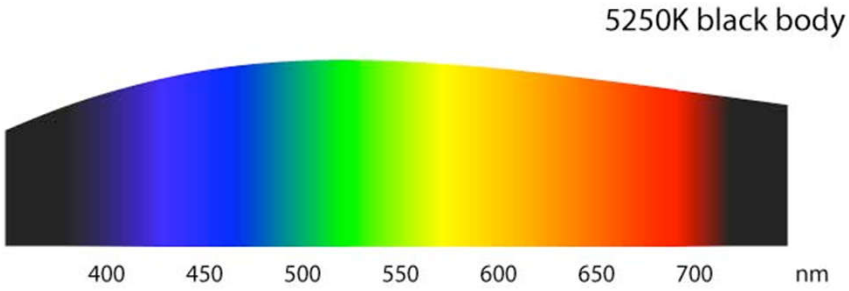
The change from Service to Maintained Illuminance

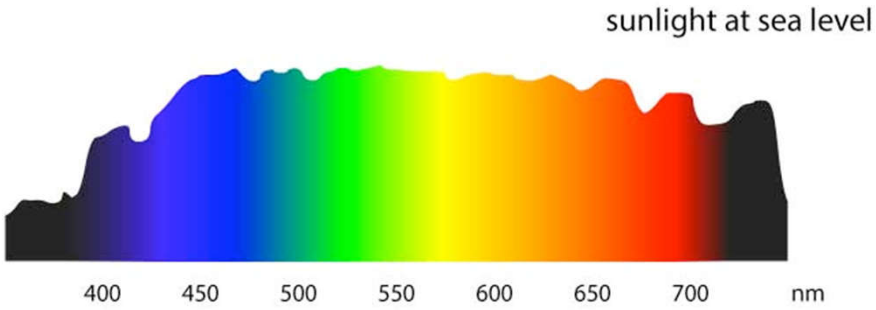
- Huge conflict in revision of AS1680.1:1990 to Service E by discounting the previous Maintained E by 20%. Most other countries just changed the unit, inflating illuminances (and electricity and global warming effects) by 20%.
- Some manufacturers and energy industries were upset (plenty of electricity to sell and fluorescent lamps had higher efficacies than GLS.

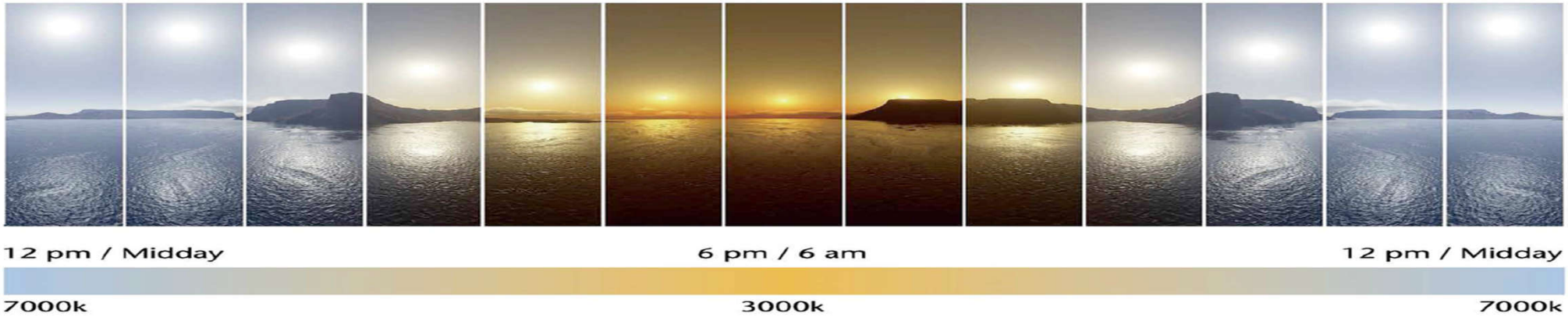
Description	CIE 29.2	AS1680
Movement and orientation	50	40
Rough intermittent	100	80
Normal (simple)	200	160
Normal (moderately easy)	300	240
Normal (moderately difficult: eg office work)	500	320
Normal (moderately difficult: eg car assembly)	500	400
Normal (difficult)	750	600
Normal (very difficult)	1000	800
Extremely difficult	1500	1200
Exceptionally difficult	2000	1600

Daylight (sun and sky)

- CIE has been unsuccessful (as has Standards Australia) in promoting daylight design to the industry and designers.
- In the past it was seen as a threat to electric lighting. Why? On average it is available for less than 50% of day-night cycle.
- Why haven't CIE and IESANZ sought the involvement of the glass, window and façade industries? (Windows are hugely expensive compared with commodity LED luminaires!)







Why can’t we make it work indoors?

- The great problem in utilizing daylight in modern buildings is that daylight penetration, using windows, is useful for only about 2.5 x window height. Further away E_H drops off exponentially and glare increases.
- Below is great lighting using only two sources.

Finally…

- We are now clock-driven people
- Previously, daylight governed work
- Now, with electric light, it's the clock
- However, we are aware of the "passage of time"
- We need reference to the outdoors to synchronise our body's clocks
- Subliminal light information is necessary for our health

CIE Australia needs to maintain and grow its interactions with the design professions, academia and government.

And… Happy 75th!