



TH to LED - A Lighting Electrician's view

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Greetings from England

Things you should know about the English ...

1. Accent - aluminium / router / tomato / zebra
2. Football
3. Food & drink
4. Sense of humour



Spitfire Low Pass.flv

Evolution



LED's the Next New Thing

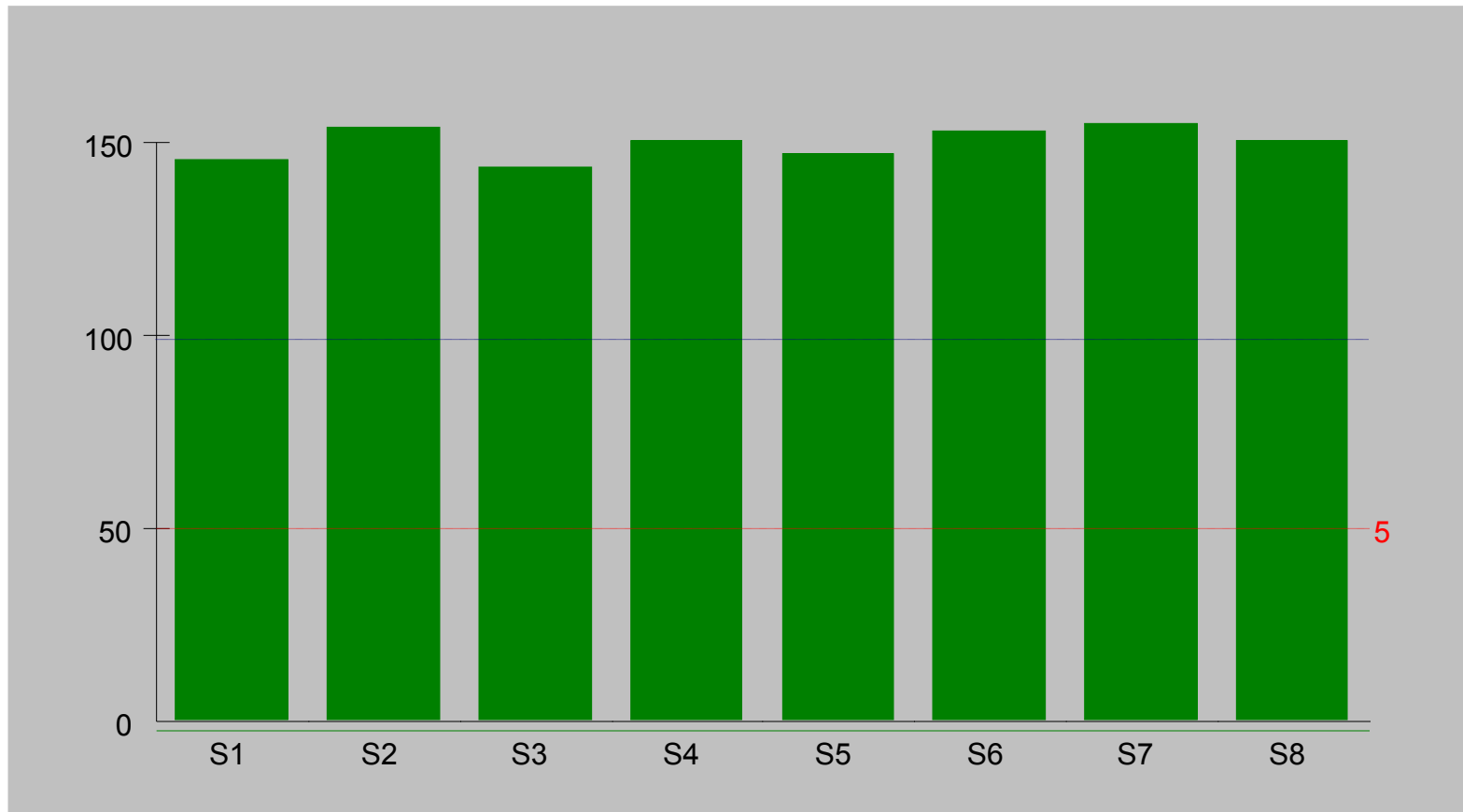


Airfield LED's – Why?





How good a they?



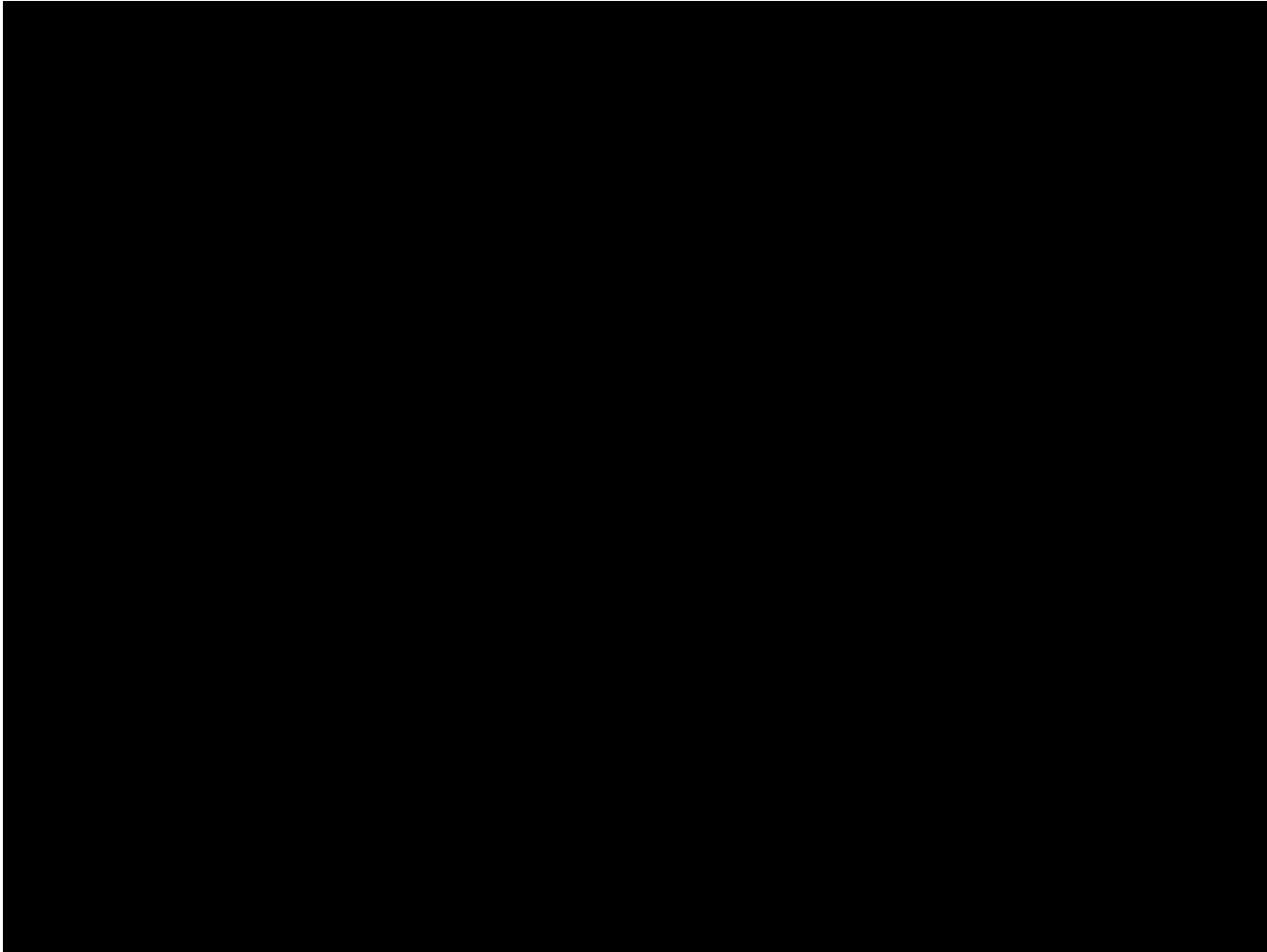


Runway trials

Why test photometrics?

- Pilots – visual cues
- Airport Operators – safe operation
- Airlines – minimise delays
- Regulators – evidence compliance

Raleigh Durham



Manchester – England LED Trial



Trial Objective: To demonstrate LED's can be used as the light source in high intensity runway lights.

Trail:

- RWY Centre Line (White & Red) – 30M Spacing
- 28 light units installed, first 1000m of RWY 23L
- Remainder TH light sources
- Secondary current 6.6A, Series Cct. Tx (100W) with directional control via switching unit
- LED Light Unit: ADB Type 'DRC' Installed in existing SR13 shallow base

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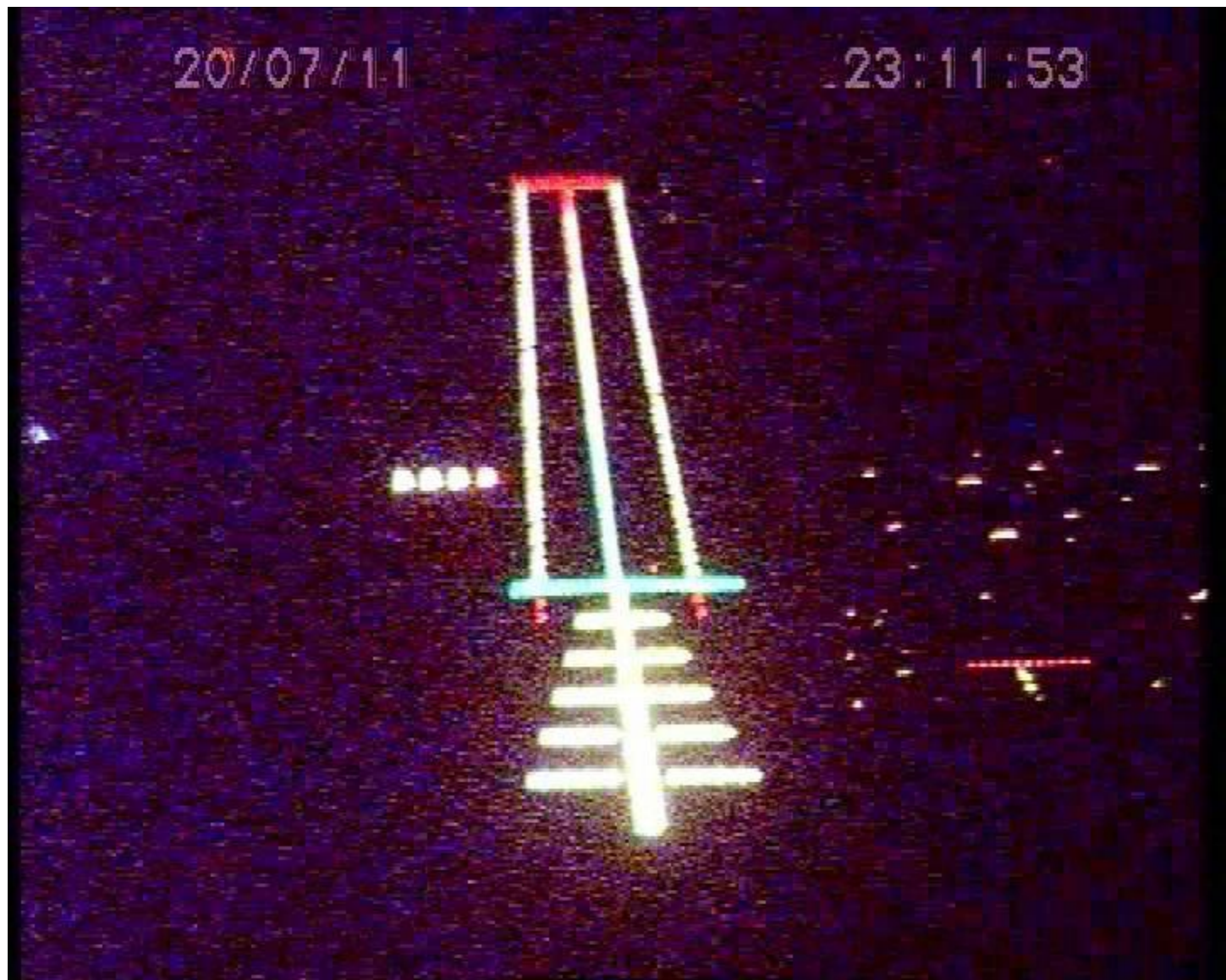
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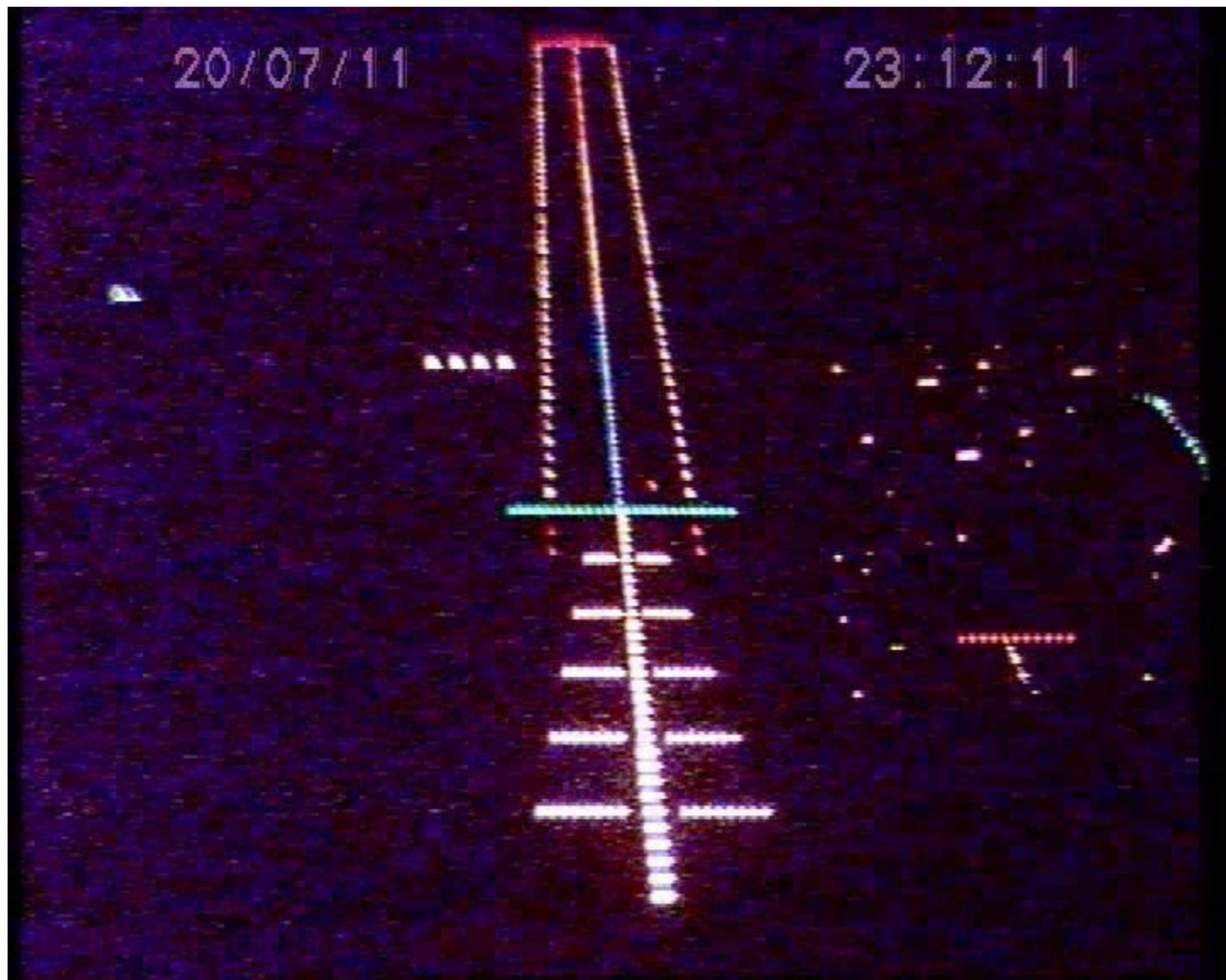
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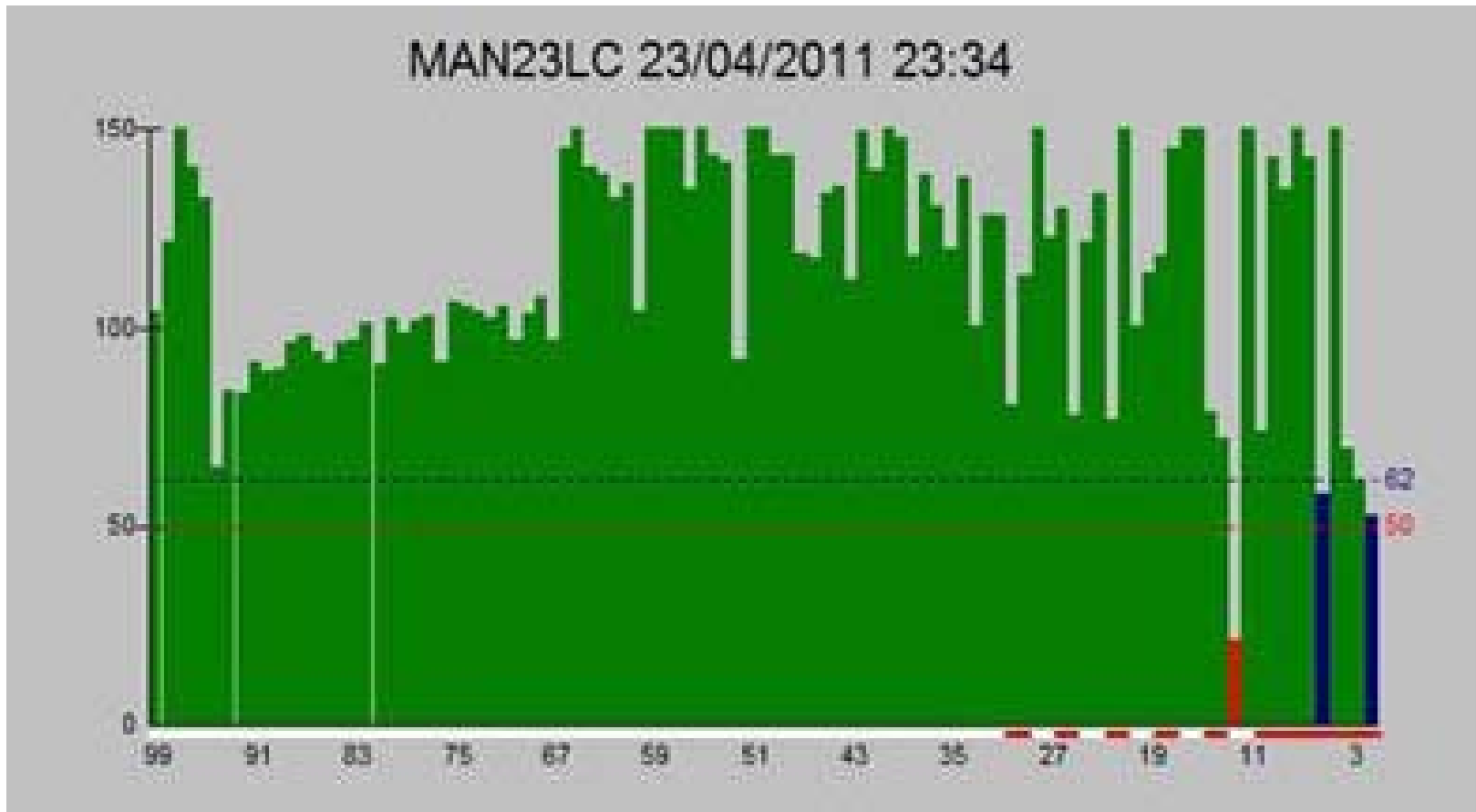


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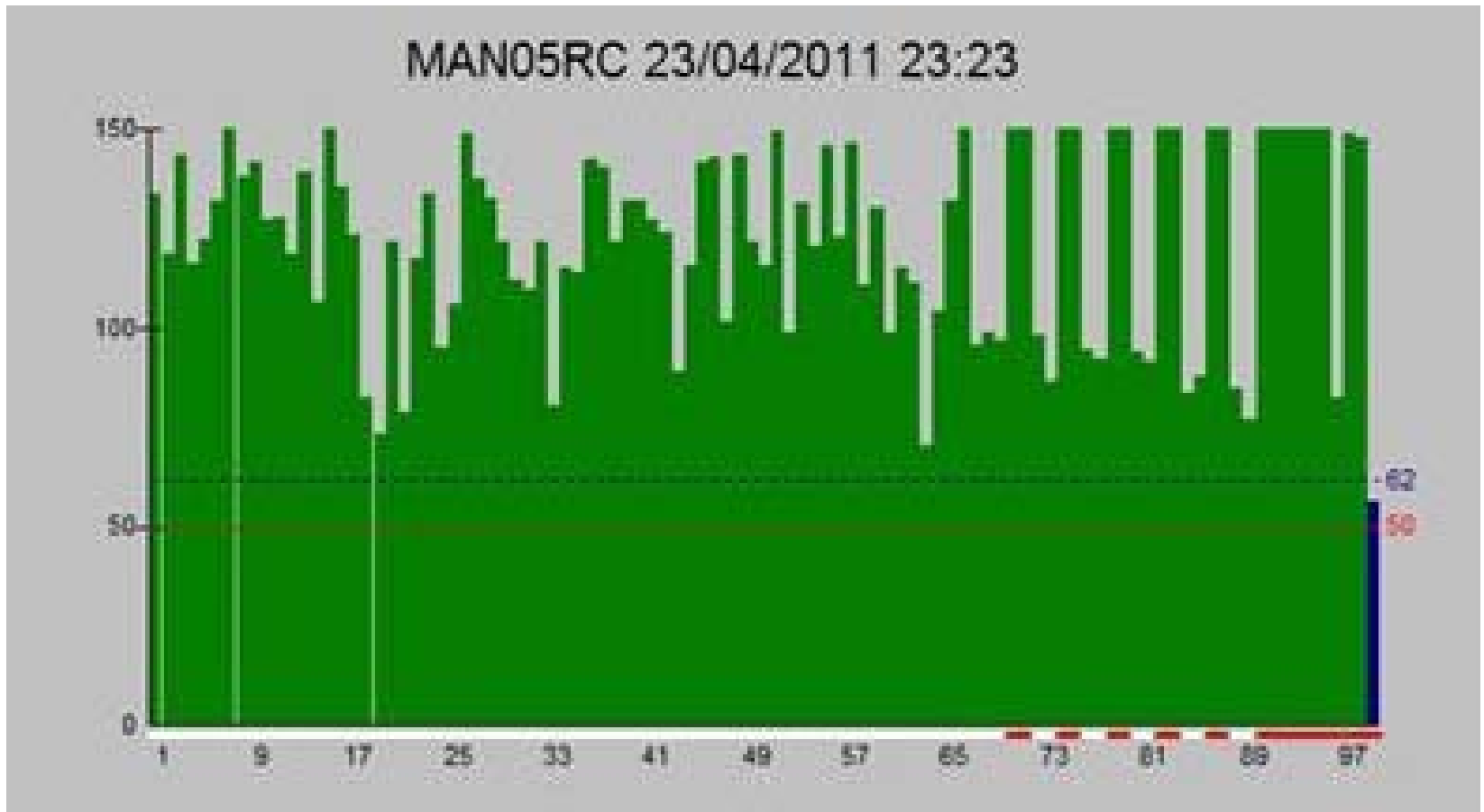
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Manchester Trial Photometrics



Manchester Trial Photometrics

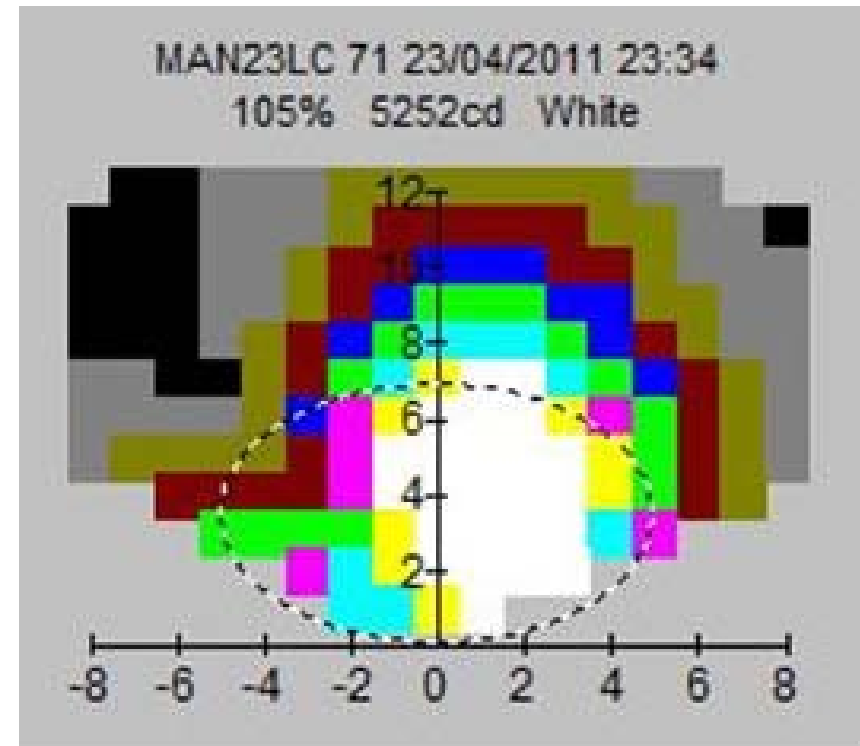
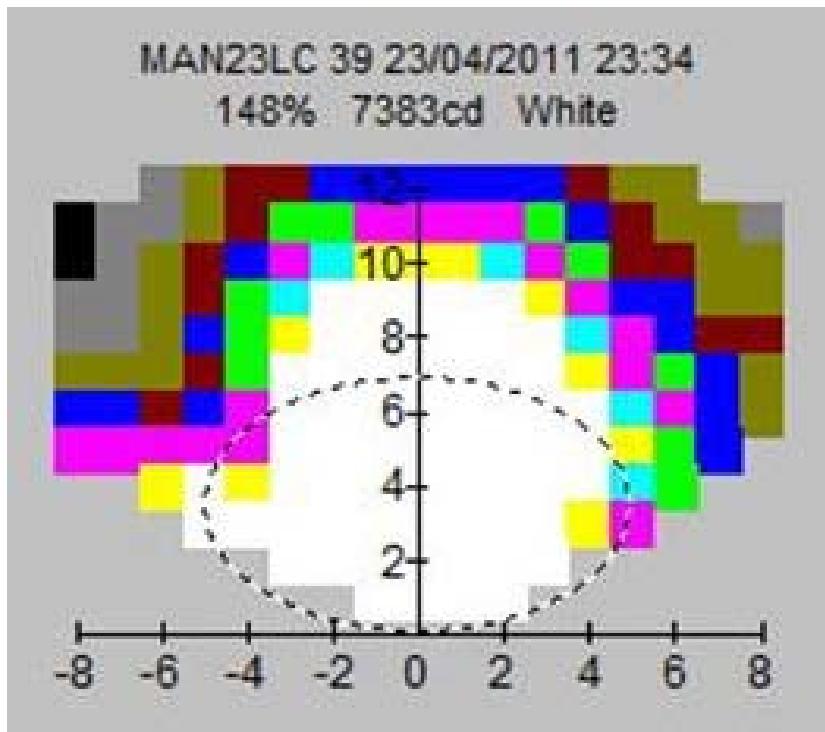




Manchester Trial Isocandella's

BEFORE - Tungsten Halogen

AFTER - LED



Manchester – England LED Trial



- Report not yet issued
- Looking good from the photometric tests we performed
- Looking good from Pilot comments



What are the Issue from an Electricians Perspective?

- Monitoring
- Colour resolution
- Temperature
- Brilliancy
- Beam
- EVS
- Other considerations

Monitoring



Most Regulatory Authorities around the World stipulate that certain Airfield Lighting services should be or must be monitored for Service Pattern interruption due to adjacent lamp failure.



Colour Resolution

Considerations:

- Chromaticity boundaries
- Dimming LED v incandescent
- Mixing incandescent / LED
- Should we mix different makes / models of LED?!

Temperature Control



- LED give off very little heat
- Won't melt ice / snow (unless heated)
- LED's don't like heat

Brilliancy



Considerations:

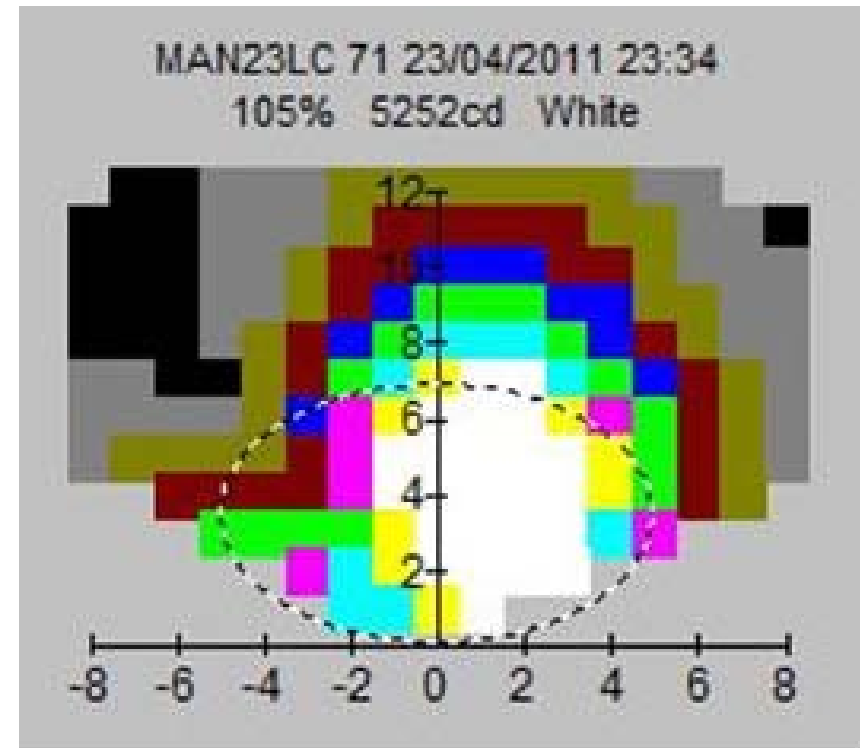
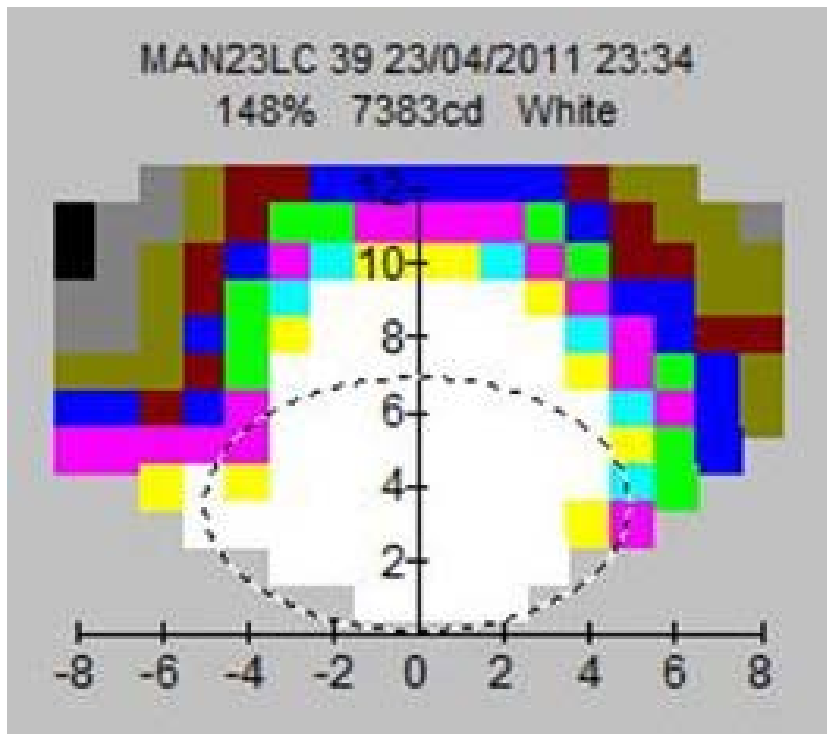
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Beam

BEFORE - Tungsten Halogen

AFTER - LED



Enhanced Vision Systems



Considerations:

- LED has no IR signature
- Currently military / GA issue



Other Considerations

Considerations:

- Non standardisation of LED technology – what goes in fitting:
- More complex fixtures leading to more complex maintenance?
- Safety



Maintenance

We still have to manage / maintain:

- Lens contamination:
 - Rubber (inset only)
 - Dirt
 - Sand
 - De-icing fluid
- Condition of lens
- Water ingress
- Current / circuits
- Quality of ramp / installation (commissioning)

Conclusion

LED's are here to stay but:

- Need right specification / standards
- Regulators need to lead
- We need regulators to enforce standards
- And in the meantime airfield electricians need to:





“

We put rules and regulations in place to keep the flying public safe. [...] There can be no compromises when it comes to safety.

—U.S. Department of Transportation
Secretary Ray LaHood