



## LED Obstacle Lighting and NVG (Night Vision Goggles)

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# Outline

- Aim
- Issue
- Background
- Way Forward
- Recommendation

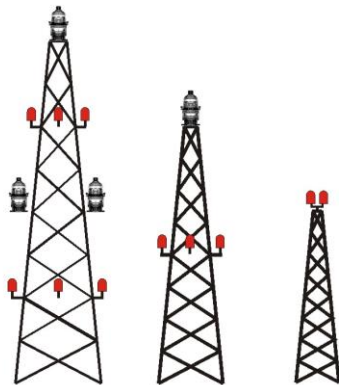


# Aim

To propose a way forward for consultation regarding LED obstacle lighting as it pertains to NVG users.

# Issue

Certain enroute obstacle lights (away from aerodromes) using LED sources cannot be seen by pilots wearing Night Vision Goggles (NVG).





# Key Events

- 1980s: RCAF introduces NVG to its operations
- 2003: STARS is first civilian user of NVG in Canada.
- 2009: TC issues a Service Difficulty Alert advising operators that certain LED light units may not be seen through NVGs. AL 2009-04
- 2014: PICA issued for STD 621, 2<sup>nd</sup> edition. In response, RCAF raised the issue of LED vs NVG
- 2016: RCAF sends letter to TCCA for same issue
- 2017: RCAF requests DG to address the issue

# Background 1 – Why LED

- Many obstacle lights now have LED sources due to the significant advantage in power consumption and in maintenance cost in comparison to fixtures having incandescent filament-type lamps.



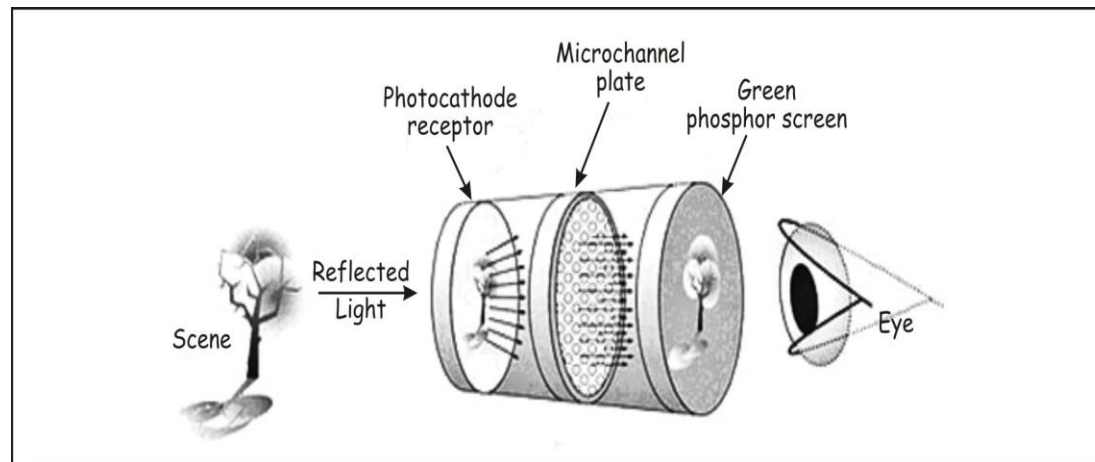
Incandescent  
1400 watts  
Life ~ 6000 hour



LED  
20 watts  
Life > 50,000 hours

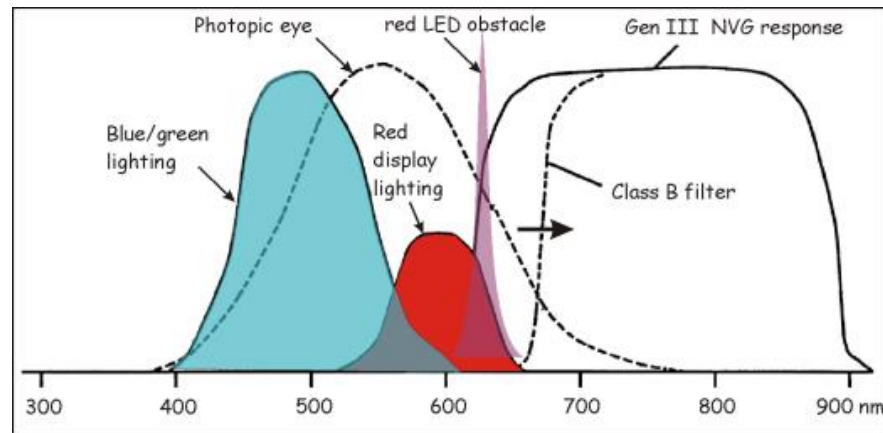
# Background 2 – Why NVG

- NVGs are imaging intensifiers. The latest generation amplifies low light levels by 30,000 to 50,000 times, giving users the ability to see beyond the visible light spectrum. This light amplification allows NVG users to operate at night using daytime limitations.



# Background 3 – LED vs NVG

- To minimize the “blinding” effect of unwanted lights, NVG compatible cockpits use the blue/green portion of the spectrum. However, some yellow/red caution lighting is still necessary and so a filter is added to the NVG to minimize the response from red lights, especially red LED.







# The way forward

- Initiate consultation with stakeholders to:
  - Confirm users' requirement to see obstacle lighting through the NVG
  - Discuss possible solutions, including the use of Infrared (IR) lights
- Initiate internal discussion on following topics:
  - Regulatory vs standards issue
  - Possible specifications for IR lighting (if deemed required).
  - Percentage of air operators using NVG (now and foreseeable).
  - Possible implementation and grandfathering issues.
  - Potential application:
    - red fixed lights? red flashing lights? white flashing lights?
    - catenary lighting? Obstacles which do not presently need visible lighting?
  - Realistic cost analysis for selected applications.



# Recommendation

Proceed with a PICA to consult stakeholder on the way forward



# Questions?