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Light Emitting Diodes (LED) pose unique challenges for operators conducting EFVS operations. Industry stakeholders and the FAA are working to provide information to help pilots as the FAA transitions from incandescent to LED approach lighting.

Light Emitting Diodes in Approach Lighting Systems

Approach lighting systems provide pilots with the visual cues to quickly and positively identify the runway environment and are one of the visual references that enable descent below minimums on an approach. Because the production of incandescent lamps has been significantly reduced, and inventory levels are low, the FAA has been researching the use of the more efficient Light Emitting Diode (LED) in an approach lighting systems. Feasibility studies, prototype development and operational capability demonstrations have validated the use of LEDs in approach lighting systems. Today, LED Lamps for approach lighting systems are being developed to supplant incandescent lamps as supplies dwindle. Soon LED lamps will become the norm for approach lighting systems throughout the NAS.

The Challenge for EFVS

Approach light systems furnished with LED bulbs will pose a unique challenge for operators conducting EFVS operations with infrared sensors, which are the most prevalent EFVS sensor technology in use today. Infrared technology displays temperature differential from objects emitting in the IR spectrum, and are ideal for imaging hot incandescent lighting. The best sensor performance has been demonstrated using IR sensors on incandescent approach lighting systems.



LEDs do not generate heat and do not emit in the IR spectrum like the incandescent bulbs they will be replacing. Pilots using EFVS with IR sensors on approaches to runways with LED approach lights may have a decreased sensor performance. Pilots may be forced to go around if they cannot identify the required visual references for continuing below minimums for the approach.

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Meeting the Challenge

The following are a few examples of the way in which the FAA and EFVS stakeholders are working to prepare for the transition to using LEDs in approach light systems.

- Several FAA offices are collaborating on how best to track the airfields where LEDs have been installed
- The ACM is discussing a means to included a symbol on approach charts to alert pilots to the existence of LED lighting. The charting will Increase awareness of the location of LEDs for flight planning purposes
- Aircraft Certification may include EFVS limitations specific to LEDs in the AFM to help pilots understand the performance limitations of their systems
- Regulations already require that pilot training includes familiarization with sensor performance which would include the effects of LEDs
- Manufacturers are developing new EFVS sensors that are designed to reduce the impact of transitioning to LEDs in approach lighting systems

