Airport Visual Aids

Illuminating Engineering Society

Spring Meeting

April 19th, 2011

Presented by Alvin Logan

FAA AAS-100

Federal Aviation Administration

Outline

- FAA Advisory Circular Updates
- Engineering Brief Updates
- FY-2011 SOWs
- R&D Efforts

Advisory Circular Updates

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AC Updates

- 5340-18F, Standards for Airport Sign Systems (08/16/10)
  - Clarified text, updated sign dimensions, sizes, and locations
- 5345-44J, Specification for Runway and Taxiway Signs (09/29/10)
  - Clarified requirements prohibiting above-ground sign power connections.
  - Clarified text, updated sign dimensions, sizes, and locations
- 5340-30F, Design and Installation Details for Airport Visual Aids Incorporated NTSB recommendations
  - Adds a note for airport managers to notify air traffic of variances in airfield lighting preset standards of the Airfield Lighting Control & Monitoring System
  - Clarification to the application of retroreflective markers

AC Updates

- 5345-12F, Specification for Airport and Heliport Beacons (9/24/10)
  - Incorporates references to EB 67
- 5345-51B, Specification for Discharge-Type Flashing Light Equipment (09/08/10)
- AC 5345-28F Update (PAPI)
  - Applied EB-67 criteria

AC Updates

- AC 5345-56A Update (ALCMS)
  - Incorporated NTSB Recommendations
    - Adds a note for airport managers to notify air traffic of variances in airfield lighting preset standards of the Airfield Lighting Control & Monitoring System
    - The preset settings for operational systems are established in accordance with FAA Order 7110.65, Air Traffic Control Handbook, latest revision. Refer to paragraph 10.3.2 for qualification test preset settings.

AC Updates

- 5345-39C, Runway and Taxiway Retroreflective Markers
  - Change cylindrical marker to meet minimum area (96 sq. in.) requirements
  - Included reference to show edge marker minimum distance from defined pavement edge.

- 5345-47B, Isolation Transformers
  - Delete reference to ASTM D4247 for wire insulation – specification is withdrawn with no replacement. Covered by D2240 and material spec. in AC text.

Engineering Brief Updates

Federal Aviation
Administration

Raleigh Durham Approach

Federal Aviation Administration

Raleigh Durham Approach

Runway Edge Lights are washed out

Federal Aviation Administration

Moratorium for LED RCLs/TDZ

Federal Aviation Administration

Memorandum

Date: SEP 17 2010

To: All Regional Airports Division Managers

From: Rick Marinelli, Manager, Airport Engineering Division, AAS-100

Prepared by: Alvin Logan, Airport Engineering Division, AAS-100

Subject: Acquisition & Installation of Light Emitting Diode (LED) Runway Centerline and Touchdown Zone Lighting Systems

The purpose of this memorandum is to announce a moratorium on the acquisition and installation of FAA LED Runway Centerline (L-850A) and LED Touchdown Zone (L-850B) Lighting Fixtures built in accordance with Engineering Brief 67, "Light Sources Other Than Incandescent and Xenon for Airport and Obstruction Lighting Fixtures" and listed in Appendix 1 of FAA AC 150/5345-53C Addendum, "Airport Lighting Equipment Certification Program".

Flight testing of the subject lighting systems has recently been conducted at Raleigh-Durham International Airport during nighttime VFR. The consensus reached was the lighting intensity of the LED fixtures exhibited bright signals even at the lowest step setting (step 1 of 5) of the constant current regulator.

The Airport Engineering Division is currently coordinating with industry to address this issue. We anticipate subsequent modifications to the Engineering Brief in the near future. Once the issue is resolved, we will notify the Regions of the product updates.

Please contact Alvin Logan at (202) 267-8743 with any questions.

Engineering Briefs Updates

- EB 67C, Light Sources Other than Incandescent and Xenon for Airport and Obstruction Lighting Fixtures (1/7/2011)
  - Defined new dimming curve for white light
  - Redefined aviation white chromaticity boundaries
  - Alternative lighting fixture accelerated life test
  - Alternative light fixture power factor and method of determination
  - Include new Category C2 surge protection requirements
  - Incorporated dominant wavelengths

Reinstatement Memo for L-850 LEDs

U.S. Department of Transporation
Federal Aviation Administration

Memorandum

Subject: **INFORMATION**: Engineering Brief 67C Light Sources Other Than Incandescent and Xenon For Airport and Obstruction Lighting Fixtures
Date: Dec 29, 2010

From: Manager, Airport Engineering Division, AAS-100
Reply to Attn. of:

To: All Regions
Attn: Manager, Airports Division

Engineering Brief 67C provides additional requirements for light sources other than incandescent and xenon technologies subject to certification under Advisory Circular 150/5345-53, "Airport Lighting Equipment Certification Program," and other applicable documents as required. It includes the required specific test and design requirements for alternative light sources that will be used in certified airfield lighting fixtures. This Engineering Brief ensures these new lighting technologies are seamlessly integrated with existing lighting technologies on the airfield.

Airfield Lighting Equipment Manufacturers employing alternative light sources in equipment certified under FAA Advisory Circular 150/5345-53 must meet the requirements contained in each applicable AC. The third party certification activity must verify the airfield lighting manufacturers' equipment meets the design and operational provisions as dictated by changing illuminating technology.

Michael T. McNerney

Federal Aviation Administration

Reinstatement Memo for L-850 LEDs

Federal Aviation Administration

Memorandum

Date: Jan 3, 2011

To: All Regional Airports Division Managers

From: Michael T. McNerney, Assistant Manager, Airport Engineering Division, AAS-100

Prepared by: Alvin Logan, Airport Engineering Division, AAS-100

Subject: Reinstatement of Light Emitting Diode (LED) L-850A, Runway Centerline and L-850B, Touchdown Zone Lighting Systems

This memorandum rescinds FAA memorandum "Acquisition & Installation of Light Emitting Diode (LED) Runway Centerline and Touchdown Zone Lighting Systems" dated Sept 17, 2010.

All testing and validation of LED L-850A and L-850B airport lighting technologies have been completed at Raleigh-Durham International airport by the FAA William J. Hughes Technical Center. Light intensity standards for Constant Current Regulator Steps 1 and 2 have been defined and standardized. The results of testing and validation are implemented in Engineering Brief 67C, "Light Sources Other Than Incandescent and Xenon for Airport and Obstruction Lighting Fixtures", dated Dec 29, 2010.

All present and future acquisitions of the subject fixtures must comply with Engineering Brief 67C, dated Dec 29, 2010. Any existing installations of LED L-850A and/or L-850B lighting technologies will require "field modifications" by the manufacturer to comply with the new Engineering Brief 67C guidance.

Thank you for your patience in this matter.

Please contact Alvin Logan at (202) 267-8743 with any questions.

Draft Engineering Briefs

- EB-84 for ALCMS Security Draft
  - Design and use of virtual private network (VPN) systems to enable secure off-site remote maintenance and monitoring of airport lighting control monitoring systems (ALCMS)
- EB-85 for Snow Plow Rings Draft
  - Design and installation criteria for a snowplow ring (SPR) that protects Style 2 and 3 in-pavement lights per AC 150/5345-46 from the destructive effects of airport plowing operations without altering photometric performance.
- EB-86 L-824 Electrical Power Cable
  - Provides information for airport lighting system designers to decide upon and select a Type B or C high voltage cable type for optimum longevity and performance.

Draft Engineering Briefs

- EB for RCL in Displaced Threshold > 700 feet
  - Technology to control interlocked switching of runway centerline lights and MALSR in displaced threshold.
- EB for FAROS/eFAROS
  - Design guidance for implementation of a direct warning system (based on LOOPs sensor) to airborne flight crews of runway occupancy status.
  - All ground based Federal Aviation Administration (FAA) surveillance systems currently depend on air traffic control (ATC) voice communications to advise aircrews about potential runway conflicts.

FY-2011 SOWs

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FY-2011 Statements of Work

- Determination of Dimming Curves.
  - blue, green, red, yellow
- Evaluate Heated Glass Solutions
- Evaluation of changing Runway Centerline Lights from Alternating White/Red to White/Yellow
  - ICAO Initiative – An accepted practice in aviation is to never cross red lights.
  - Current RCL lighting cues does not support this practice.
  - Field test both incandescent and LED RCL technologies.

FY-2011 Statements of Work

- PAPI Alignment Tool Evaluation
- Evaluate Strip LED Lighting
- RFI (Radio Frequency Interference) from Accent LED Lights at Yuma Intl Airport (3 Led, 4-Watt, high performance mr16/gu10 base, 120V)
  - Switching of the diodes…sharp rise in current?

R&D Efforts

R&D Efforts

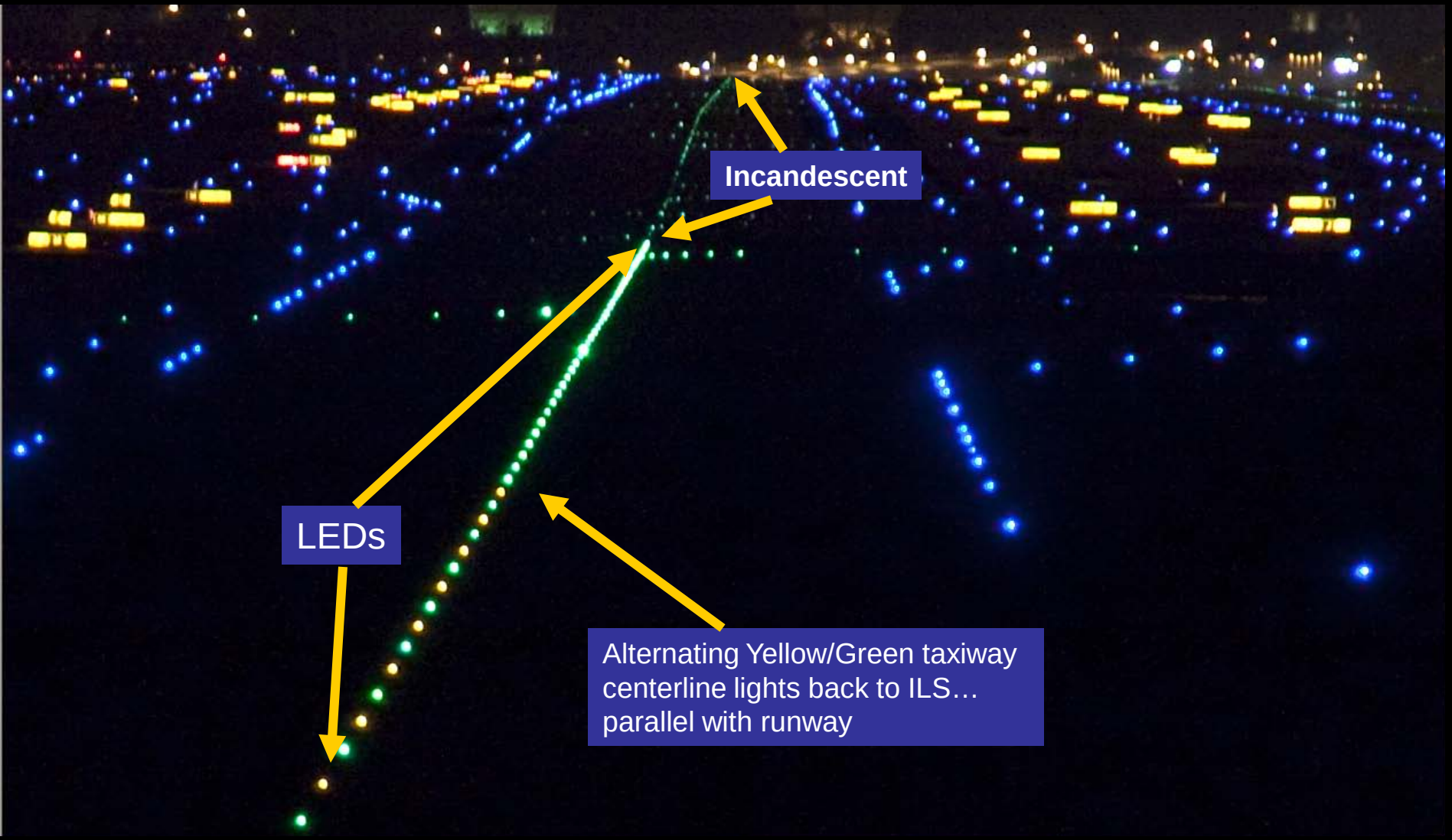
- RWSL/THL and ALSF-II Evaluation
  - Determine if confusion exists when take-off hold lights and RELs are collocated.
- EFVS/LED Incompatibility Issue
  - G-20 Committee with SAE
- NVG Testing of LED L-810 with Class A Filter
- LED MALSR IR Feasibility Study

Policy

- Developing cost benefit assessment guidance for technology determination (LED vs. incandescent)

Questions?

Federal Aviation Administration


Incandescent
LEDs
Alternating Yellow/Green taxiway centerline lights back to ILS… parallel with runway