Inspection of Aerodrome Lighting

Presented to: ICAO / FAA Regional Work Shop for Aerodrome Certification Safety Inspectors

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Aerodrome Design and Operations

- Chapter 5.3 Lights
Aerodrome Beacon

• At aerodrome intended for use at night
• Located on or adjacent to the aerodrome
• Flashes from 20-30 per minute
  – Alternating green with white flashes OR
  – White flashes only
Approach Lighting Systems

• Non-Precision Instrument Runway-
  Simple approach lighting system 5.3.4.2
  – Row of lights on extended centerline
  – Crossbar 300m from threshold

• Precision Approach- CAT I
  – Row of lights on extended centerline
  – Crossbars at 300m intervals
Precision Approach CAT II and III

- Extended center line lights extending 900m from the runway threshold
- Two side row of lights extending 270m from threshold
- Two crossbars, located at 150 m and 300 m from the threshold.
VASI- Visual Approach Slope Indicator systems

- RWYs used by turbojets
- Difficulty in judging approach
- Objects in approach area
- Hazard conditions at either end of runway
- Terrain or weather conditions may cause turbulence
Runway Threshold Lights

• Provided for lighted runways except on non-instrument runways or non-precision runways where the threshold is displaced.
• NPI - at least 6 lights
• CAT I – intervals of 3m
• CAT II & III - uniformly spaced not >3m
Wing Bar Lights

- Provided on precision approach runway when additional conspicuity desirable
- Provided on non-precision where the threshold is displaced and threshold lights are required.
Runway End Lights

- Provided for a runway equipped with runway edge lights
- Consists of at least 6 lights
- Unidirectional showing red in the direction of the runway.
Runway Centerline Lighting

- Centerline lighting is white except:
- last 2000 feet of edge lights split yellow/white
- last 3000 feet centerline lights red/white
- last 1000 feet centerline lights red
Runway Centerline lights, edge lights and end lights.
Displaced Threshold Lighting

Area usable for rollout, taxiing and takeoff

DISPLACED THRESHOLD

10’
Taxiway Edge Lights

- Color is blue
- Distance between lights can vary based on length of TWY
  - cannot exceed 200 feet between lights
- Frangible mounts < 3” above grade
Other Lighting

- Intermediate holding position lights
- Runway Guard Lights
- Apron floodlighting
- Visual docking guidance systems
Taxiway Centerline Lights

- Color is green
- For RVR ops 1000 feet and above, spacing is max of 25 feet
- For RVR ops below 1000 feet, max spacing is 12.5 feet
Installation of Light Fixtures

- MIRL, HIRL, MITL may be base-mounted
- LIRL, MIRL, HIRL, MITL may be stake-mounted
- Frangible no higher than 3” above grade
- Leveled and aligned within 1 degree
- Top of elevated fixture 14” above grade (may be increased in areas where mean annual snowfall exceeds 2 feet)
Installation of Light Fixtures

In this area, the maximum fixture height is 14 inches

In this area, the fixture height may be increased 2 inches per foot. The maximum fixture height 10 feet from the taxiway edge is 30 inches above grade.
Performance Requirements for Runway Lights

Runway lights that support CAT II/CAT III must be

- Remotely monitored, or
- Visually inspected prior to the start of CAT II/CAT III with repeated visual inspections/pilot reports every 2 hours while in CAT II/CAT III
Performance Requirements
Taxiway Lights

• No 2 adjacent lights inoperative
• Lights not below normal brightness
• Lights not obscured by snow, ice, dirt, etc.
• No more than 10% of lights inoperative
Inspection of Lighting Systems

Components, configuration, installation and operation of the systems.

- RWY and TWY lighting systems and their application
- Obstruction lights, windsock
- Airport Beacon
- Approach Lighting Systems
- Apron Lighting
Inspection Checklist

- Installed correctly
- Properly oriented
- Operational at all intensities
- Frangible mounts/disconnect plug
- Clean, undamaged lenses
- Uniform intensity
Inspection Checklist

- Correct color and configuration
- No confusing or deceptive conditions
- Properly maintained
- Non-protruding stakes
- Proper current
- Standby power
Inspecting Runway Lighting
Criteria for CAT I

Runway end lights – 75% operational

Runway edge lights – 85% operational

Runway threshold lights – 75% operational
Criteria for CAT II & III Runways

For Cat I, II & III runways, the threshold light bar is part of the approach lighting system.
Inspecting windsock lights
FAA Standards
CFR Part 139

Section 139.311 Marking, Signs, and Lighting
Section 139.311(c)

Each certificate holder must provide and maintain lighting systems for air carrier operations when:

- The airport is open at night
- During conditions below VFR
Section 139.311(c)(1) – (c)(5)

Lighting systems must consist of at least

1. Runway lighting that meets the specifications for takeoff & landing minimums for each runway
2. A taxiway lighting system
3. An airport beacon
4. Approach lighting that meets the specifications for the authorized runway takeoff and landing minimum unless provided and/or maintained by other than the certificate holder
5. Obstruction marking and lighting on each object determined by FAA to be an obstruction
Section 139.311(c)(2)

Taxiway lighting system must be one of the following:

- Centerline lights
- Centerline reflectors
- Edge lights
- Edge reflectors
Section 139.311(d)

Each certificate holder must properly maintain each marking, sign or lighting system installed and operated on the airport.

- Cleaning, replacing or repairing any faded, missing or nonfunctional item
- Keeping each item un-obscured and clearly visible
- Ensuring each item provides accurate reference to the user
Section 139.311(e)

Each certificate holder must ensure that all lighting on the airport is adjusted or shielded to prevent interference with air traffic control and aircraft operations; including lighting for:

- Aprons
- Vehicle parking areas
- Roadways
- Fuel storage areas
- Buildings
FAA Airport Lighting Standards

Advisory Circular 150/5340-26B Maintenance of Airport Visual Aids

Advisory Circular 150/5340-30F Design and Installation Details for Airports Visual Aids

Advisory Circular 150/5345-12F Specification for Airport and Heliport Beacons

Advisory Circular 150/5345-39D Specification for L-853, Runway & Taxiway Retroreflective Markers
Questions?