

# **INTERTEK AIRPORT LIGHTING EQUIPMENT CERTIFICATION PROGRAM**

## **IESALC Government Contacts Subcommittee Meeting**

**Virtual Meeting May 20, 2020**

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# INTRODUCTION



- **Purpose / Outline**

- Overview of ALECP
- Update of Current Program Status
- Update on Current Initiatives



# TESTING VS. CERTIFICATION



TESTING	CERTIFICATION
ONE-TIME EVENT	TESTING ALONG WITH CONTINUED SURVEILLANCE
MAY NOT BE COMPREHENSIVE	MUST INCLUDE ALL APPLICABLE SPECIFIED TESTING AND REQUIREMENTS
ONLY APPLIES TO SAMPLES TESTED	MUST INCLUDE STRICT CONFIGURATION MANAGEMENT SO CONSISTENCY OF PRODUCED PRODUCTS CAN BE MONITORED
NO MONITORING OF PRODUCTION	PRODUCTION MONITORING REQUIRED
RESULTS IN TEST REPORT	RESULTS IN CERTIFICATE, LISTING, AND AUTHORIZATION TO USE A MARK

# AIRPORT LIGHTING EQUIPMENT CERTIFICATION

Certification Program covers all equipment specified in the FAA AC 150/5345 series:

- Rotating Beacons
- Obstruction Lights
- Wind Cones
- Isolation Transformers
- Taxiway/ Runway Inpavement Lights
- Retroreflective Markers
- Cable Connectors
- Underground Cable
- Runway & Taxiway Signs
- Portable Runway Lights
- Light Bases Constant Current Regulators
- Precision Approach Path Indicators (PAPI)
- Runway End Identification Lights (REIL)



# ALECP PURPOSE AND APPLICABILITY



- **Purpose is to assist in enhancing aviation safety by:**
  - Insuring good quality, reliable, airfield lighting products
  - Verifying equipment performance so that all pilots receive reliable, standardized visual queues.
- **Applicability of ALECP Certification**
  - **Airfield Lighting Products:**
    - Only FAA acceptable means to satisfy Title 14 CFR Part 139 Section 139.311 Certification of Airports
    - Mandatory for all projects funded by Federal AIP for PFC monies
    - Widely used around the world to insure a standard level of performance

# ALECP PURPOSE AND APPLICABILITY



- **Applicability of ALECP Certification**
- **Obstruction Lighting Products:**
  - **FAA Regulations - 14 CFR Part 77**
    - 77.7 – Specifies the requirements for notifying the FAA of construction or alteration of an obstruction.
      - FAA Form 7460-1, Notice of Proposed Construction or Alteration
    - 77.9 - Specifies what types of construction requires notification to the FAA.
    - 77.17 – Provides the definitions of obstructions.
    - 77.29 – Describes the aeronautical study that the FAA does to evaluate the impact of the proposed obstruction.
    - 77.31 – Describes the determination that FAA makes for each obstruction.
      - Determination of No Hazard to Air Navigation is issued with conditions including the lighting and marking.
    - 77.33 – Determination of No Hazard to Air Navigation is good for 18 months.

# ALECP PURPOSE AND APPLICABILITY



- **Applicability of ALECP Certification**

- **Obstruction Lighting Products:**

- **FAA AC 70/7460-1L**

- Describes how obstructions must be marked and lighted

- Section 12.4 states that lighting equipment should conform to the latest version of FAA AC 150/5345-43.

FAA AC 150/5345-53 lists the manufacturers that have demonstrated compliance

Other manufacturers' equipment may be used if it meets the requirements of -43

# CURRENT ALECP PROGRAM STATISTICS



- 60 program participants
  - (5 pending)
- 66 licensed manufacturing facilities
  - (7 pending)
- Certifications since the Fall Government Contacts Meeting in October 2019
  - 32 new or full re-qualification certificates
  - 24 revised certificates
  - 4 de-listings



# ALECP PROGRAM STATUS



## COVID – 19

Testing activity remains operational with necessary precautions

Client visits are possible with necessary precautions

Delayed inspections due to travel restrictions

- Roughly 12% of the first inspections are complete

- A few inspections have been done remotely

- Will decide in mid-June if all inspections will be remote



# ALECP PROGRAM STATUS

- Lamp Life Testing
  - More common due to alternate lamps being qualified.
  - Result of challenges sourcing incandescent and quartz halogen lamps.
- (AL-2B Form)

4. Documentation	
<input type="checkbox"/>	a. Submit OEM Spec Sheet
<input type="checkbox"/>	b. If rated useful life hours < 8,750 hours, submit participant's plan for lamp life testing (FAA AC 150/5345-53D, Appendix 5).
<input type="checkbox"/>	c. If LED, submit participant's procedure to measure LED junction temperature per EB67D para 2.4b.
<input type="checkbox"/>	d. If LED, submit report of the LED junction temperature as measured using submitted procedure.
<input type="checkbox"/>	e. If LED, submit flicker compliance statement addressing EB67D para 2.15.

**\*\* Please submit electronically a separate file for each document named for easy identification; one document per file \*\***

# ALECP PROGRAM STATUS



- Lamp Life Testing

Relevant specification requirements:

FAA AC 150/5345-46E section 3.8.e – L-860, L-861, L-804, L-852A,B,C,D,J,K lamps must have a “minimum rated life” of at least 1,000 hours.

FAA AC 150/5345-46E section 3.8.e – L-850, L-862, L-861SE, L-852E,F,S,G lamps must have a “minimum rated life” of at least 500 hours.

FAA AC 150/5345-12F section 3.4.3.a – L-801, L-802 lamps must have a “minimum rated life” of at least 4,000 hours.

FAA AC 150/5345-28H section 3.2.1(10) – L-880, L-881 lamps must have a “minimum rated life” of at least 1,000 hours.

# ALECP PROGRAM STATUS



- Lamp Life Testing

Relevant specification requirements:

FAA AC 150/5345-53D Appendix 2 section 5.c.vii

Lamp life tests must be done per Appendix 5.

Must be done within 6 months from the issue of the product certification.

FAA AC 150/5345-53D Appendix 5, section 3.a – Rated life is defined as the mean value established by test and calculations done per this Appendix 5 procedure.

# ALECP PROGRAM STATUS



- Lamp Life Testing

FAA AC 150/5345-53D Appendix 5 Procedure

Initial photometry done on all fixtures

Compliance margin determined

10 lamps operated on 20 on / 4 off cycle

Input current and light output monitored

Insets installed on bases in sand

Test stops when 9 lamps fail



# ALECP PROGRAM STATUS



Lamp Life						Allowable Drop
Order	Lamp #	# of days	Operating Time (hrs.)	Lowest 10% excluded		
1	2	35	700			33.2%
				- mean	squared	
2	3	48	960	-172.5	29756.3	23.3%
3	4	50	1000	-132.5	17556.3	21.5%
4	5	53	1060	-72.5	5256.25	16.9%
5	10	56	1120	-12.5	156.25	38.5%
6	1	57	1140	7.5	56.25	26.4%
7	6	58	1160	27.5	756.25	30.2%
8	9	60	1200	67.5	4556.25	25.3%
9	7	71	1420	287.5	82656.3	31.9%
		Mean	1133	Variance		17594
10	8	71	Still in Tolerance			40.4%
Standard Deviation of population					133	
Lamp Life Mean (rounded to the nearest 50 hours.)					1150	
Required Minimum Rated Life					1000 Hours	
Pass/Fail					Pass	

# NEW SPECIFICATIONS



## Cancelation dates:

Each new AC states that it cancels the previous version

## Effective dates:

FAA AC 150/5345-53D section 12.a.v

The previous equipment certificates automatically expire on the given effective date.

Effective dates are usually six months from the issue date.

# NEW SPECIFICATIONS



## **FAA AC 150/5345 – 43J (Specification for Obstruction Lighting Equipment)**

Issue date – March 11, 2019

Effective date – March 11, 2020 (Updated based on AC 70/7460 revision)

### **Principal Changes:**

1) Clarification to 3.3.8 and 4.2.11 to exempt DC systems from the Transient Protection requirement

ANSI/IEEE C62.41-1991, IEEE Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits.

2) Clarification to 3.3.11 limiting the interlock switch requirement to high voltage discharge xenon systems



# NEW SPECIFICATIONS



## FAA AC 150/5345 – 43J

### Principal Changes:

#### 3) Change to L-810 photometric requirements

3.4.1.2 Note added to require 32.5cd minimum “over the minimum vertical beam spread of 10 degrees”.

3.4.1.2.1 (L-810(F) section) States “With respect to the center of the beam and over a vertical range of +/-5 degrees, there must be a minimum intensity of 32.5cd...”

# NEW SPECIFICATIONS



**FAA AC 150/5345 – 43J**

## **Principal Changes:**

4) To be NVG compatible, red obstruction lights (L-810(L), L-864(L), and L-885(L)) must include IR emitters or be used in conjunction with a standalone IR emitter.



# NEW SPECIFICATIONS

**FAA AC 150/5345 – 43J**

**Minimum IR Radiant Intensity in the 800-900nm range:**

IR radiation angular distribution must match the visible light photometric angular distribution for the applicable product type.

- 4 mW/sr for L-810(L) applications
- 246mW/sr for L-864(L) and L-885(L) applications
- Analogous to luminous intensity in cd = lumen/sr
  - Not to be confused with radiance or irradiance
  - Sum of energy from 800-900nm instead of the photopically corrected luminous intensity
- Peak value for flashing applications (effective intensity calculations are not applied)



# NEW SPECIFICATIONS

## FAA AC 150/5345 – 43J

### Monitoring / Control

- IR emitters must be monitored in accordance with the requirements in FAA AC 150/5345-43J.
  - Section 3.3.5.2.2
    - Failures must be monitored (outage or flasher failure).
    - FAA EB67D section 2.6 must be considered.
    - Monitor signals must be failsafe.
    - Must be provisions to permit connection to a remote alarm device.
- IR emitter failure and visible light failure can be coupled or de-coupled. In either case, an alarm signal must be generated to indicate the failure.

# NEW SPECIFICATIONS



## FAA AC 150/5345-42J (Specification for Airport Light Bases, Transformer Housings, Junction Boxes, and Accessories)

**Issue Date: September 12, 2019**

**Effective Date: March 12, 2020**

### Principal Changes:

#### L-894 – Elevated Light Cover

0.63” max height was removed.

Now references the general yield point height requirement of 3”

- FAA AC 150/5300-13A, Change 1, paragraph 307b(4)
- FAA AC 150/5220-23, 3.2.c(1)(c)





# NEW SPECIFICATIONS

FAA AC 150/5345 – 42J

## Principal Changes:

Clarified standard thread sizes.

0.88" max thread depth was removed.

The requirement for the cover to be sloped was removed (this was only in draft)



# NEW SPECIFICATIONS



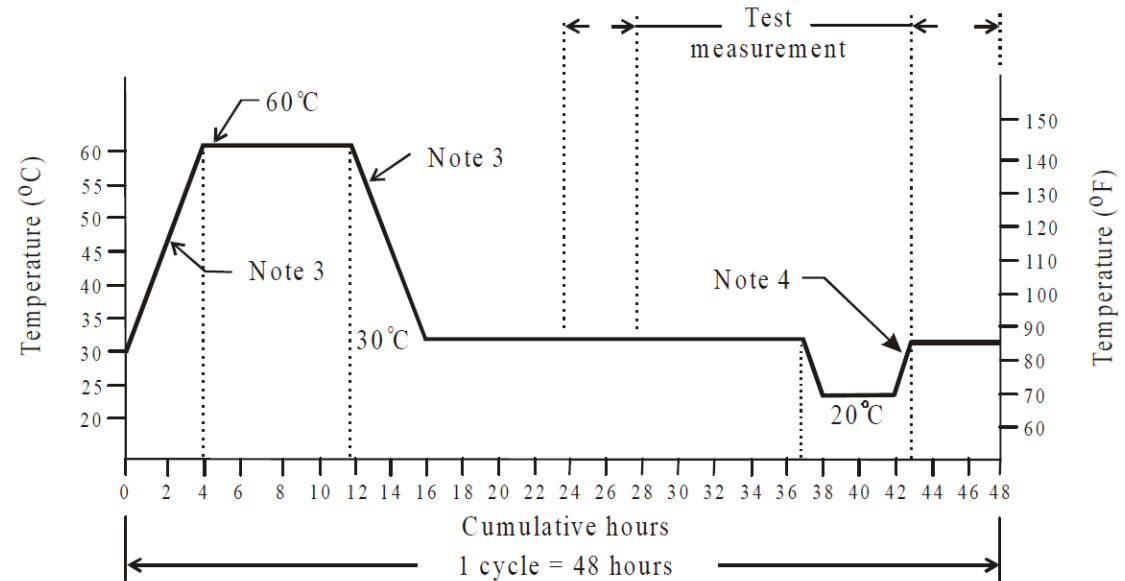
## FAA AC 150/5345-28H (Precision Approach Path Indicator (PAPI) Systems)

Issue Date: July 29, 2019

Effective Date: January 29, 2020

### Principal changes:

#### 1) Humidity Test



Test was added to section 4.14 to verify compliance with the existing requirement.

References MIL-STD-810F, Method 507.4, Figure 507.4-1 (1 January 2000)

Proper operation, no corrosion or excessive internal condensation

# NEW SPECIFICATIONS



**FAA AC 150/5345-28H**

**Principal changes:**

## **2) Chromaticity – Section 3.2.1, Item 7.b**

Alternative was provided for both lighting technologies (LED and incandescent) to use the same red chromaticity requirements.

Incandescent PAPI red sector can comply with either EB67D or SAE AS25050 red chromaticity requirements.



# NEW SPECIFICATIONS



FAA AC 150/5345-28H

Principal changes:

## 3) Dew and Frost Prevention

Section 3.2.2(4) – The light unit must prevent dew or frost/ice from accumulating on its lens surfaces.

May be accomplished by thermostatically activated heating or

Intrinsic heat management (such as incandescent lamps)

# NEW SPECIFICATIONS



**FAA AC 150/5345-28H**

**Principal changes:**

## **4) Horizontal Light Beam Coverage – Section 3.2.4.1.3**

PAPI must be designed to be capable of modifying the horizontal light beam coverage.

May be accomplished using baffles or blanking devices.

Listed as an option in 1.1.4(3).

# NEW SPECIFICATIONS



**FAA AC 150/5345-28H**

**Principal changes:**

## **4) Horizontal Light Beam Coverage – Section 3.2.4.1.3 (continued)**

If the horizontal light beam coverage adjustment feature is integral to the PAPI light fixture design...

Section 4.9(8) requires photometric tests without the horizontal light beam coverage adjustment features in use, and with the full possible adjustment in place.

Photometric tests include all beam pattern requirements of 3.2.1.

(Intensity distribution, transition width, straightness, flatness, and chromaticity)

