Intertek Airport Lighting Equipment Certification Program

IES Government Contacts Subcommittee, May 7, 2015

Washington, DC

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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 Eligible Product Types

- L-801 Beacons,Medium Intensity (AC 150/5345-12)
- L-802 Beacons, High Intensity (AC 150/5345-12)
- L-804 Light, Holding Position Edge (AC 150/5345-46)
- L-806 Wind Cones, Frangible (AC 150/5345-27)
- L-807 Wind Cones, Rigid (AC 150/5345-27)
- L-810 Lights, Obstruction (AC 150/5345-43)
- L-821 Panel, Airport Lighting Control (AC 150/5345-3)
- L-823 Connectors, Cable (AC 150/5345-26)
- L-824 Underground Electrical Cable for Airport Lighting Circuits (AC 150/5345-7)
- L-827 Monitors, Regulator (AC 150/5345-10)
- L-828 Regulators, Constant Current (AC 150/5345-10)
- L-829 Regulators, Monitored Constant Current (AC 150/5345-10)
- L-830 Isolation Transformers, 60Hz (AC 150/5345-47)
- L-831 Isolation Transformers, 50Hz (AC 150/5345-47)
- L-841 Cabinet, Auxiliary Relay (AC 150/5345-13)
- L-847 Switch, Circuit Selector (AC 150/5345-5)
- L-849 Lights, Runway End Identification (AC 150/5345-51)
- L-850 Lights, Runway, Inpavement (AC 150/5345-46)
- L-852 Lights, Taxiway, Inpavement (AC 150/5345-46)
- L-853 Markers, Retroreflective (AC 150/5345-39)
- L-854 Radio Controls (AC 150/5345-49)
- L-856 Lights, Obstruction, High Intensity,White, 40 FPM (AC 150/5345-43)
- L-857 Lights, Obstruction, High Intensity,White, 60 FPM (AC 150/5345-43)
- L-858 Signs, Runway and Taxiway (AC 150/5345-44)
- L-859 Lights, Flashing, Omnidirectional (AC 150/5345-51)
- L-860 Lights, Runway Edge, Low Intensity (AC 150/5345-46)
- L-861 Lights, Runway & Taxiway Edge, Medium Intensity (AC 150/5345-46)
- L-862 Lights, Runway Edge, High Intensity (AC 150/5345-46)
- L-863 Lights, Portable Runway (AC 150/5345-50)
- L-864 Lights, Obstruction, Red, 20-40 FPM (AC 150/5345-43)
- L-865 Lights, Obstruction, Medium Intensity, White, 40 FPM (AC 150/5345-43)
- L-866 Lights, Obstruction, Medium Intensity, White, 60 FPM (AC 150/5345-43)
- L-867 Light Base, Non-Load Bearing (AC 150/5345-42)
- L-868 Light Base, Load Bearing (AC 150/5345-42)
- L-880 Precision Approach Path Indicator (AC 150-5345-28)
- L-881 Abbreviated Precision Approach Path Indicator (AC 150/5345-28)
- L-882 Generic Visual Approach Descent Indicator (AC 150/5345-52)
- L-883 Generic Visual Approach Descent Indicator (AC 150/5345-52)
- L-884 Power and Control Unit for Land and Hold Short Lighting Systems (AC 150/5345-54)
- L-885 Lights, Obstruction (AC 150/5345-43)
- L-890 Airport Lighting Control and Monitoring Systems (AC 150/5345-56)
- L-891 Frangible Support Structure (lower to service) (AC 150/5345-45)
- L-892 Frangible Support Structure (lower to service) mounted on a rigid steel tower (AC 150/5345-45)
- L-893 Lighted Visual Aid to indicate runway closure (AC 150/5345-55)

FAA AC 150/5345-53D

- Third Party Certifier Acceptance Criteria
  - Section 5
- Third Party Certifier Application (every 4 years)
  - Section 6
  - Background as a certification body
  - Competency verification (accreditations)
  - Resumes of related staff
  - Copy of procedural guide and license agreement

FAA AC 150/5345-53D

GENERAL OUTLINE

- Manufacturer submits certification request via AL-2 application form
- Qualification testing
- Documentation submittal and engineering review
- Initial manufacturing facility audit
- License Agreement
- Certificate issued and product listed in 53D Addendum
- Certification process covered under ANSI accreditation to ISO Guide 65

AL-2 Request for Certification (continued)

Required Product Documentation listed in section 6 of AL-2

- Section & part drawings
- Assembly drawings and schematics
- BOM with mfg name/catalogue numbers
- Statement of Warrantee
- Instruction/installation/operating manual
- Product Description sheet (marketing)
- AL-2B Lamp Life form

Qualification Testing

FAA AC 150/5345-53D, Appendix 2, section 5.C.i

Must be done IAW ISO 17025

At Intertek – covered under A2LA accreditation

Outside of Intertek – covered by audit and witness

- Test Plan Review and Acceptance
- Assignment to Intertek Representative
- Formal Report issued by Manufacturer

Qualification Testing

When is testing required?

1. 8 year re-qualifications (4 years for L-890 ALCMS)
2. Product modifications

   -requires - AL-2 resubmittal

   - associated documentation

   - abbreviated testing
3. Specification updates

Semi-annual Inspections

- AL-7 Audit (follows basic ISO quality assurance requirements)
- AL-1; AL-1A Contact Sheet
- Product Checklist(s)
  - Construction review using the applicable ACs
- Production Testing Requirements
  - As required in the applicable ACs

Current Program Status

67 Program Participants

78 Licensed Manufacturing Facilities

Certificates issued since the fall meeting:

- 53 new and requalification
- 29 revised

NEW SPECIFICATIONS

- FAA AC 150/5345-10H (Specification for Constant Current Regulators and Regulator Monitors)
  - Dated November 5, 2014
  - Posted on November 21, 2014
  - Principal change relates to CCR response to short duration input voltage losses.
  - Certifications must be updated by September 18, 2015.

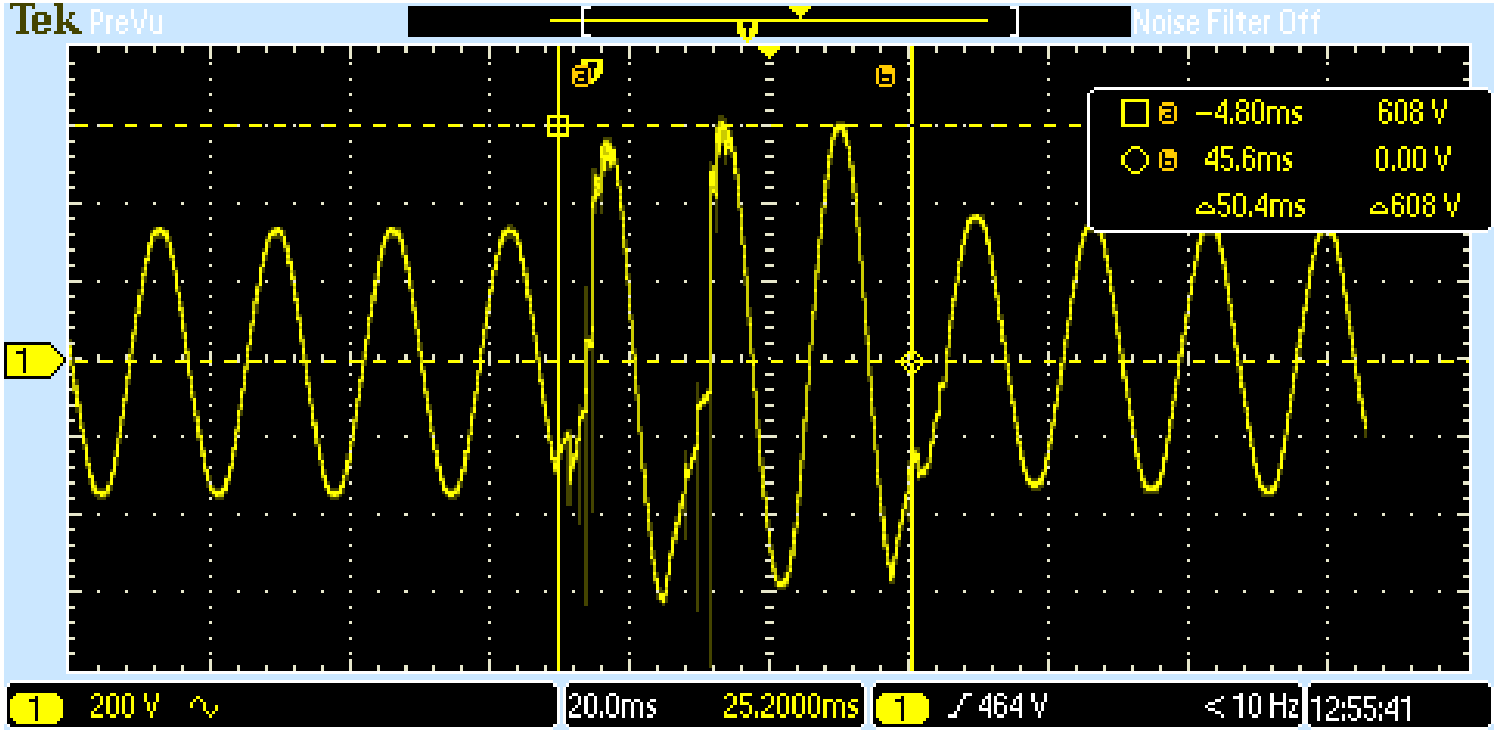
NEW SPECIFICATIONS

- FAA AC 150/5345-10H Paragraph 4.2.17a
  - Surge suppression test on the output of CCR
  - ANSI/IEEE C62.41-1991 Category C3
  - 20kV / 10kA combination wave

  - Output was previously exposed to a 15kA surge.

NEW SPECIFICATIONS

- FAA AC 150/5345-10H Paragraph 4.2.18
  - Momentary overvoltage defined in 3.3.4c
  - Repeated application of 120% for 50ms



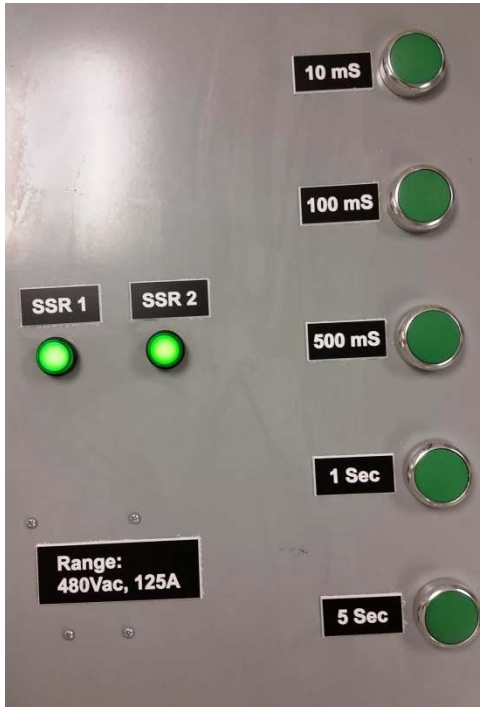
NEW SPECIFICATIONS

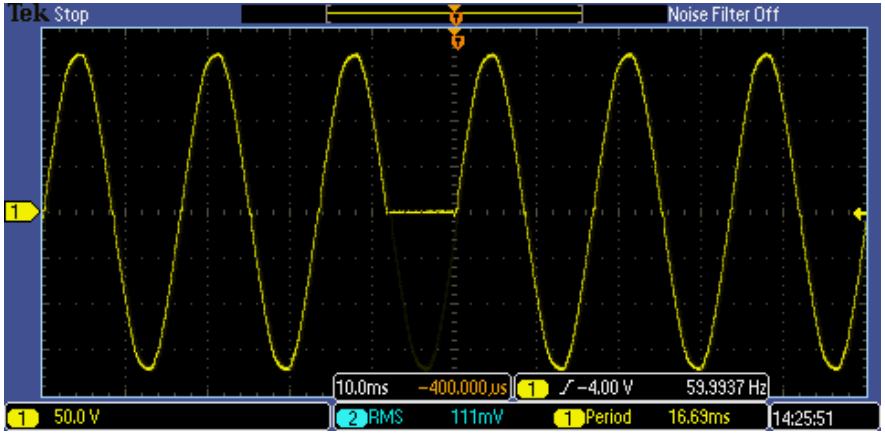
- FAA AC 150/5345-10H Section 3.3.11
  - Input losses of up to 500ms
  - Resume operation (CCR on at commanded step and producing current) within 1 s
  - Current must be stabilized and in specified tolerance within 5 s. (3.3.7a)

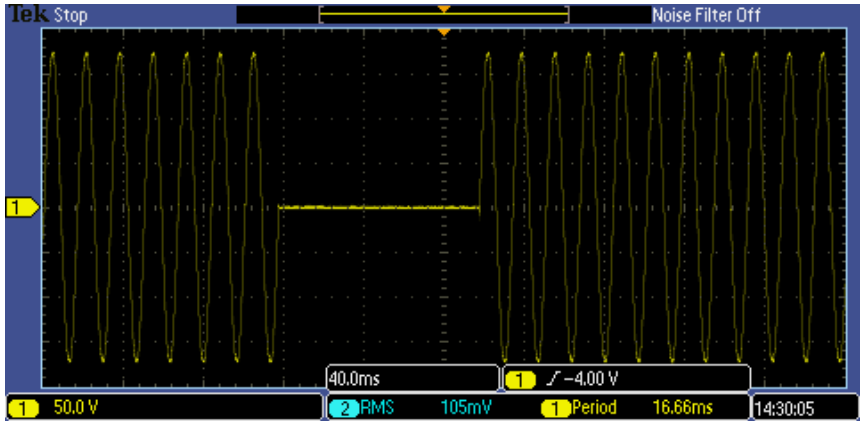
NEW SPECIFICATIONS

Test Procedure to verify 3.3.11

- 4.2.13c (Protective Device Tests)
- Must record CCR response
- Must record voltage and current waveforms







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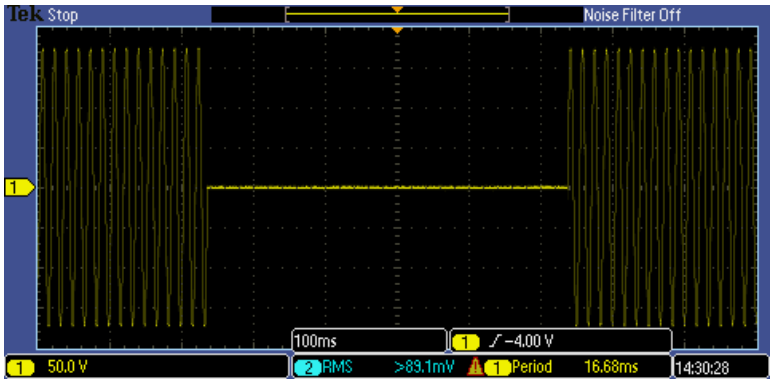
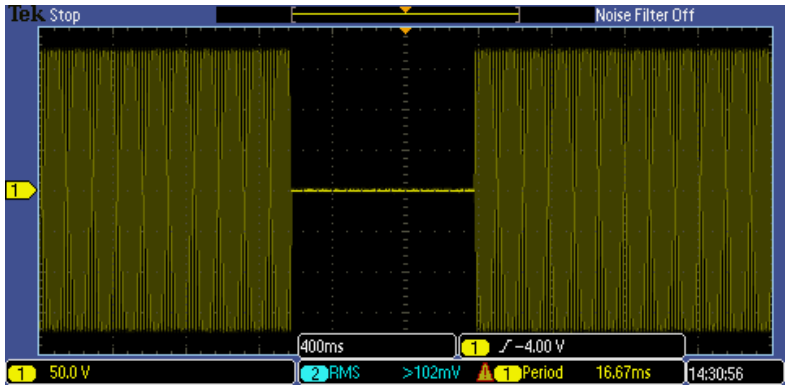
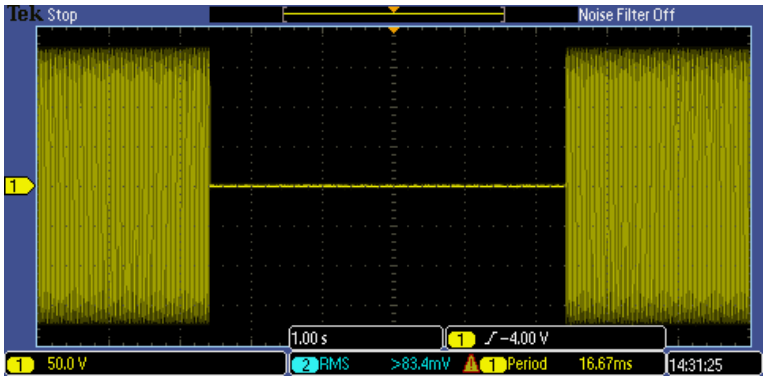






NEW SPECIFICATIONS

Test Procedure to verify 3.3.11

- 4.2.13c (Protective Device Tests)
- Also related to 4.2.15 (Output Current Surge)
- 3.3.10.2d – Over - current events less than 250ms must not activate the over-current protection.

DRAFT SPECIFICATIONS

FAA AC 150/5345-46E -- Specification for Runway and Taxiway Light Fixtures

FAA AC 150/5345-42H—Specification for Airport Light Bases, Transformer Housings, Junction Boxes and Accessories

- First manufacturer's review comments were due on January 26, 2015.
- Public comment period to be determined.

DRAFT SPECIFICATIONS

Background:

Currently, elevated light baseplates are certified as part of the light since the requirements are found in FAA AC 150/5345-46D.

Baseplates do not have their own “L” designation like other similar equipment found in FAA AC 150/5345-42G.

When elevated lights are certified, they are done so with a particular baseplate.

DRAFT SPECIFICATIONS

Baseplate related requirements:

FAA AC 150/5345-46D:

3.7.2.1 – Must firmly position transformer receptacle mating face at the yield point. Must not interfere with drainage.

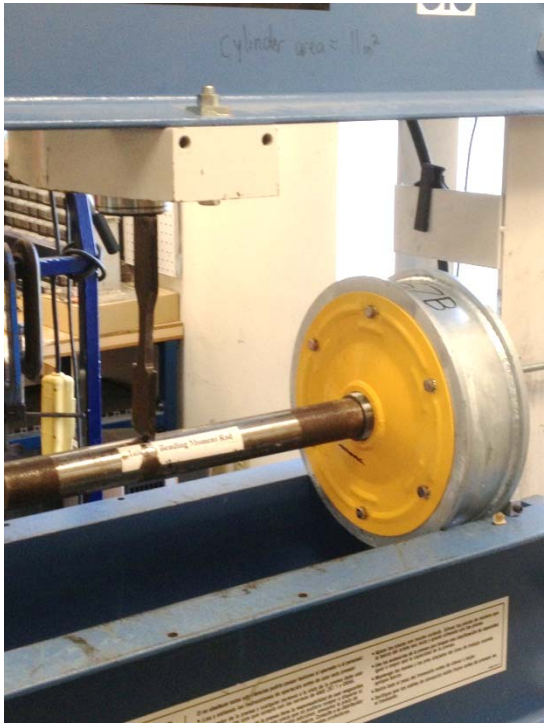
3.9h – Elevated lights with exposed metal parts must be grounded.

FAA AC 150/5340-30H:

12.7 – Light Fixture Bonding:

"Fixture must be bonded to the light base ground lug via a #6 AWG stranded copper wire rated for 600V with green XHHW insulation or a braided ground strap of equivalent current rating."

DRAFT SPECIFICATIONS



Baseplate related requirements:

FAA AC 150/5345-46D:

3.4.2.2 – interface with L-867

- provided with gasket
- 2,500 lb compressive load
- 2,500 ftlb for L-804 and 700 ftlb for all other applications

4.4 – Load Test – verification of mechanical requirements.

- Acceptance criteria: no permanent deformation, cracking of materials or finish, breaking, damage

DRAFT SPECIFICATIONS

Proposed Baseplate Certification Conventions:

L-867 – Light Base, Non-load Bearing
L-868 – Light Base, Load Bearing
(AC 150/5345-42H)

Manufacturer	Manufacturer's Catalog Number											
	Type	Size	Class	Base	Ext	Conv. Ring	Cover Plate	Spacer Rings	Adapter Rings	Mud Cover	Elevated Light Base Plate	L-804 Base Plate
	L-867	B	A									

Intertek


IES/ALC
ILLUMINATING ENGINEERING SOCIETY
AVIATION LIGHTING COMMITTEE