

Notes on Presentation to IES Conference Chicago - 28 October to 1 November 2007

Introduction

(These notes apply to the presentation *Chicago 27oct07.ppt* given to the Government Contact Subcommittee on 29 October 2007)

The past year has gone slowly. Some success and other issues that are in progress.

(1) In our work with the ICAO Visual Aids Working Group (VAWG) we have ...

(a) Obtained acceptance to incorporate the FAA photometric specification for taxiway edge lights with a modification that the minimum of 0.2cd is to extend to only 75 degrees rather than the present FAA of 90 degrees vertical. This should allow the use of those designs of solar powered light fixtures with the solar cells mounted on the top.

(b) Some advance was made for Windfarm marking and lighting, by establishing white as the colour of the turbine support mast and blades.

(c) For 2008 we intend to make a proposal for low and medium intensity lights specifications to be included into Annex 14. This proposal is motivated by the increasing use of solar powered light fixtures.

(2) We continue to have a concern for the degradation of light output of some inset light designs due to water in Light Channel.

Slide 3: Water entering the light channel will block light output up to the pavement level. This means that a flush fixture will have the entire lens covered with water. However, the FAA specification AC 150/5345-46c paragraph 4.3.4 for photometric testing, limits the application of the opaque tape to only half the lens.

Slide 4: The condition of water in the light channel (as during a rain storm) will alter the light beam such that it will no longer conform to requirements.

Slide 5: Recent testing of one particular fixture showed a reduction from 9.07 average candelas without water in the light channel to 0.22 average candelas with water in the light channel. A reduction of 97.5 percent. However, if the opaque tape is limited to only half the lens this fixture is likely to pass FAA testing.

(3) We are continuing with our study of the measurement means for LED light fixtures. Specifically that of blue taxiway lights. To date we have sent a sample light unit to two laboratories for photometric testing. Although both laboratories found conformance to requirements, the difference in measured values is of interest.

Slides 6, 7, 8 and 9: The difference in measured values does not appear to be consistent over the measured range in both the vertical and horizontal. Further investigation is needed.

(4) The formula for multiple flashes, as used for the night mode of obstruction lights needs to be addressed. The formula specified in AC 150/5345-43f by the FAA will determine a different value of effective intensity from that of ICAO.

Slide 10: The FAA formula for multiple flashes which in combination are seen as a single flash, can be reduced to a formula similar to the ICAO, since the denominators are of FAA formula are equal. The value of this denominator ... $0.2 + t_A - t_1$... is much less than that of the ICAO formula ... $0.2 + t_1 - t_2$... for reason that $t_A - t_1$ is of a single flash whereas the $t_1 - t_2$ is of the combination of flashes.

Since the summed area of the flashes would be essentially equal, the result of use of the formulas leads to a determined value of effective intensity which is inversely proportional to the denominators. That is, the FAA formula produces a large value of intensity that is to a factor of ...

$$(0.2 + t_1 - t_z) / (0.2 + t_A - t_1)$$

For example, if duration of a single flash is say 0.1 second and there are four flashes, the result is

$$(0.2 + 0.4) / (0.2 + 0.1) = 0.6/0.3 = 2$$

Thus a light fixture meeting FAA needs only half the intensity as to ICAO.

(4) Transport Canada has established new standards for windturbine and windfarm marking and lighting. Basically these standards follow that intended by the FAA for use of the L-864 red flashing obstruction light and simultaneous flashing. We differ in that the spacing of the L-864s is specified as "in the order of 900m". This will allow some flexibility for the installer.

Slide 11: This is a diagram intended to show how various spacings of two L-864 lights might appear to the pilot. The window or "view area" of 46cm was arbitrarily selected on the basis of a pilot's shoulder width of 18".

Slide 12 and 13: Windfarm at Pincher Creek, Alberta. This is an older windfarm and the lighting is that of dual L-810s. The location of the windfarm is in a farming area and represents an obstruction primarily to crop dusters.

(5) Some years ago, Transport Canada did extensive laboratory testing on PAPI light units in regard to frost prevention and removal. This led to an advisory requiring operation at 4.8 amperes or turn-on for at least 30 minutes prior to flight arrival. We are in the process of re-issuing this advisory in light of new methods from manufacturers for preventing frost/condensation on PAPI.

Slide 14: To determine the time of defrost, a 1/16" (0.0625") (1.6 mm) layer of frost was applied. The method of application followed the Canada Motor Vehicle Safety Standard #103 "Windshield Defrosting and Defogging", albeit the thickness of frost was in excess of that required by this standard.

(6) Slide 15: Our major effort this year is to revise the Canadian manual of standards TP312 "Aerodrome Standards and Recommended Practices" with objective for issuing a new manual designated as CAR 322 "Certification Standards for Land Aerodromes". CAR = Canadian Aviation Regulations

(7) Slide 16: The Airport Lighting discussion group has been highly successful. The group can be found at

<http://tech.groups.yahoo.com/group/airportlighting/>

Submitted by:

Eduard Alf, P.Eng.

Transport Canada – AARTA
330 Sparks Street
Ottawa, Ontario,
K1A 0N8
Canada

work phone: 613-990-2100

work email: alfe@tc.gc.ca

home email: yeoman@videotron.ca