IESALC

Seaview

Galloway, New Jersey

October 2010

IESNA RP-37
***Recommended Practice for Outdoor Lighting for the Airport Environment*, Update**
IESALC Recommended Practice Subcommittee

Agenda

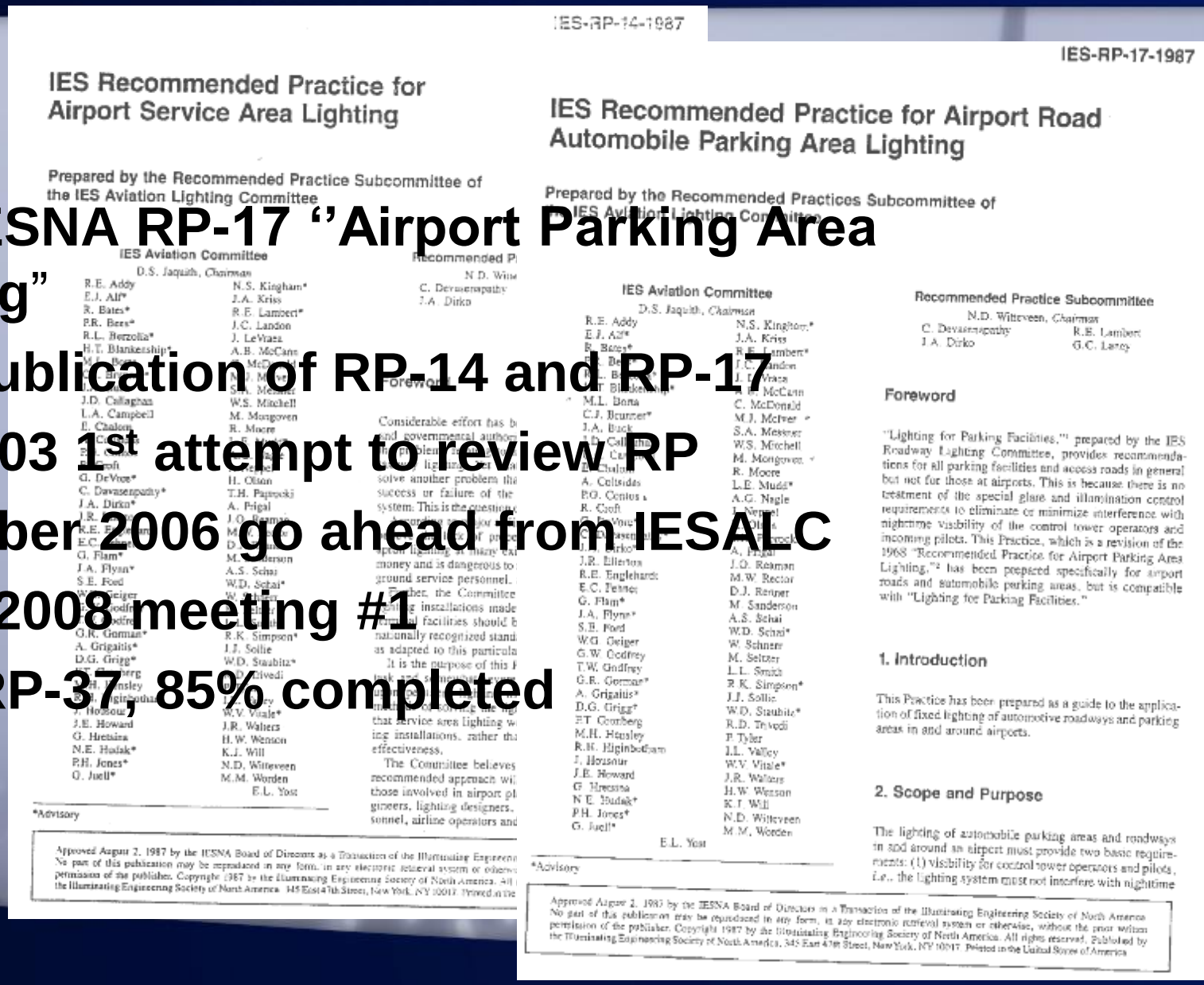
- Committee Members
- History & Scope
- Review of some sections
- Pictures taken and more to come!
- Table 4.1 results and new information
- Comments on RP-37
- Front cover picture
- Conclusion

- Fred Loeffler, RW Armstrong
- Alfred Seiterle, Aeroplan
- Mike Tebeau, Lambert-St Louis International Airport
- John Wujeck, RW Armstrong
- Richard Larivée, Avia Rupta Solutions
- Manufacturer #1 – to be filled
- Manufacturer #2 – to be filled
- Airport #2 – to be filled
- Airport #3 – to be filled
- Graphics and layout - Éclairage Techno

Thanks to : Gilles Lauzière, Urbex

Committee Members

- 1968 IESNA RP-17 ‘’Airport Parking Area Lighting”
- 1987 Publication of RP-14 and RP-17
- May 2003 1st attempt to review RP
- November 2006 go ahead from IESALC
- March 2008 meeting #1
- 2010, RP-37, 85% completed



IES-RP-14-1987

IES Recommended Practice for Airport Service Area Lighting

Prepared by the Recommended Practice Subcommittee of the IES Aviation Lighting Committee

IES-RP-17-1987

IES Recommended Practice for Airport Road Automobile Parking Area Lighting

Prepared by the Recommended Practices Subcommittee of the IES Aviation Lighting Committee

Foreword

1. Introduction

2. Scope and Purpose

History

- **The scope of this recommended practice covered:**
  - Outdoor lighting in the airport environment includes aircraft ramp and apron areas, roadways, vehicular parking facilities, passenger loading and unloading areas and pedestrian walkways.
  - The recommendations included in this RP are to provide guidance lighting practices for the reasonably safe movement of equipment, enhancing of personal security and the deterring of vandalism.

Scope

Table of Contents

- Introduction
- Characteristics of Airport Areas
- Visual Issues
- Specific Area Design Criteria
- Essential Safety and Security Lighting
- Environmental Condition and Sustainable Development
- Maintenance Considerations
- Economics
- Lighting Equipment
- Definition
- Reference
- Annex

- Aprons
- Other Airport Facilities
- Roadways and pedestrian ways
- Parking
- Other exterior lighting

Characteristics of Airport Areas - Pictures

Characteristics of Airport Areas - Pictures

DRAFT FOR IESNA
RP-37 OUTDOOR LIGHTING FOR THE AIRPORT ENVIRONMENT

LIST OF PICTURES / DIAGRAM / LAYOUTS

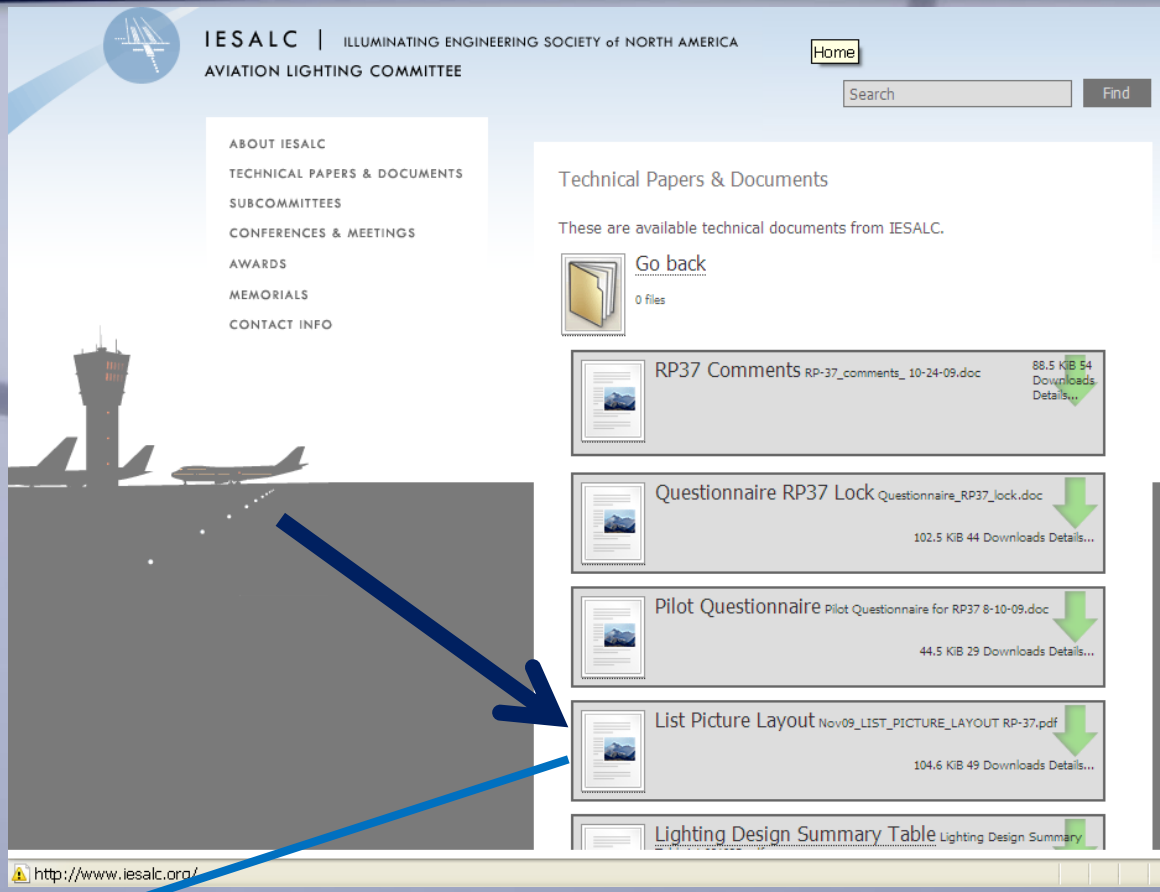
→ *Front cover*

1.0 INTRODUCTION
1.1 Purpose
1.2 Scope
→ *Picture of Airside night time*
→ *Picture of Landside night time*
→ *Picture of Adjacent development to airport*

2.0 CHARACTERISTICS OF AIRPORT AREAS
→ *ALP Layout*

2.1 Aprons; commercial; (air carrier), general aviation, cargo, hangar
→ *Ramp Layout*
→ *Picture day and night time*
2.1.1 Aircraft Stand
→ *Layout lines, focus on limit of stand, wing tips, roads, building and poles*
2.1.2 Passenger Loading and Unloading
→ *Picture of passenger boarding bridges and stairs*
2.1.3 Baggage and Catering Loading and Unloading
→ *Picture of incline belt conveyor attached to the back of the aircraft*
→ *Picture of catering truck at aircraft door*
2.1.4 Cargo Facility Loading and Unloading
→ *Picture of Container lift c/w container*
→ *Cargo pallet roller section*
2.1.5 Other Aircraft Stand Service Operations
→ *Picture of equipment to show relative dimension: tug, mobile GPU, mobile PCA, sanitary truck, de-icing vehicle*
2.1.6 Mechanical Checks and Maintenance and Repair
→ *Picture of first officer inspecting underneath aircraft*
2.1.7 Fueling Operations
→ *Picture of fueling operation under wing with task light*
2.1.8 Engine Run-up / Test Area
→ *Picture of Engine run-up /test area*

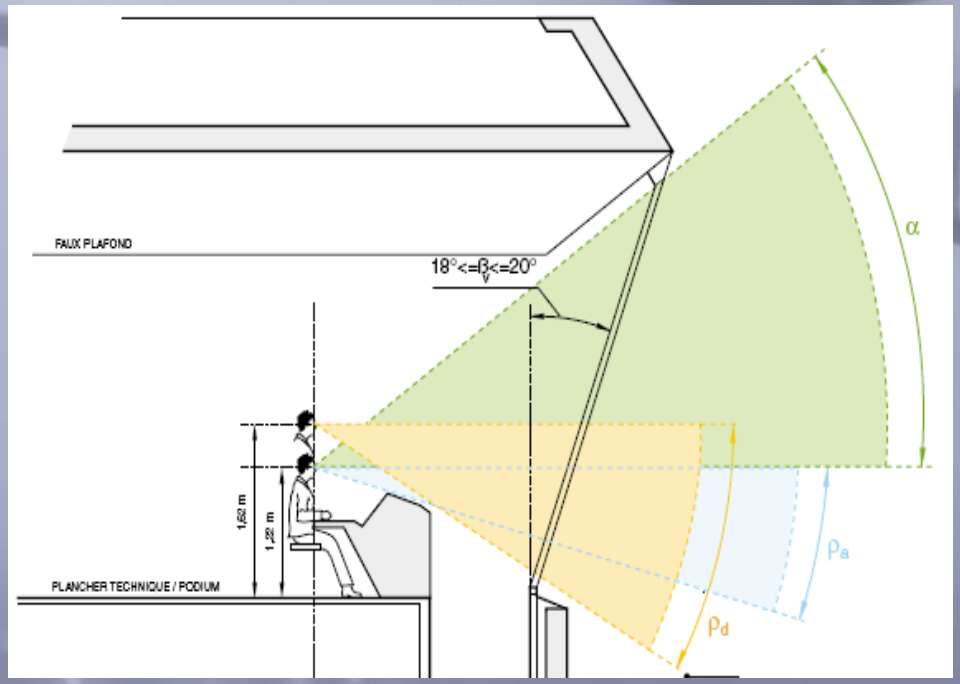
2.2 Other Airport Facilities
2.2.1 De-icing/anti-icing Facilities
→ *Layout of the facility*
2.2.1.a Remote deice pad
→ *Picture of facility*
2.2.1.b Deice storage Facilities and Truck Loading
→ *Picture of storage and pumping to truck areas*
2.2.2 Fuel Facilities
2.2.3 Ground Services Equipment (GSE) Areas



http://iesalc.org/iesalc-files/recprac/

Characteristics of Airport Areas - Pictures

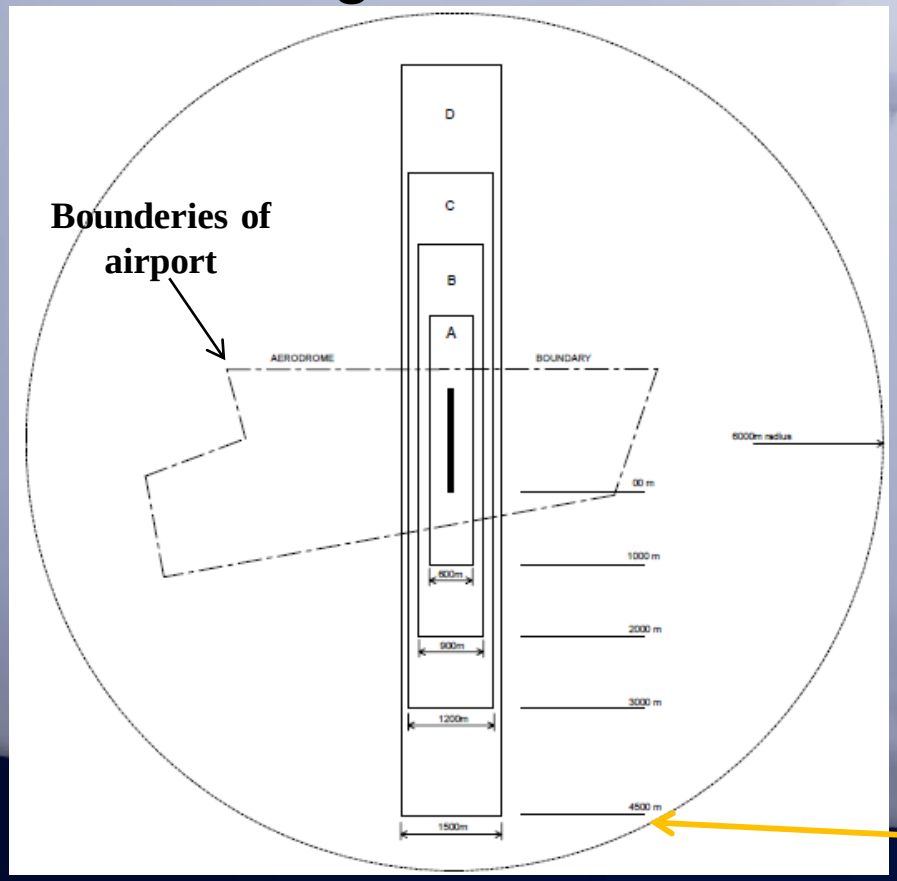
- **Airport control tower**
  - Line of sight
  - Obtrusive light
    - Max value at cab 1 Lux
  - Other criteria?



STBA vigie et bloc technique - 1998

Visual Issues

- **Approaching the airport**
  - Protection of approach
- **Coverage and limitation**



CASA (Australia)

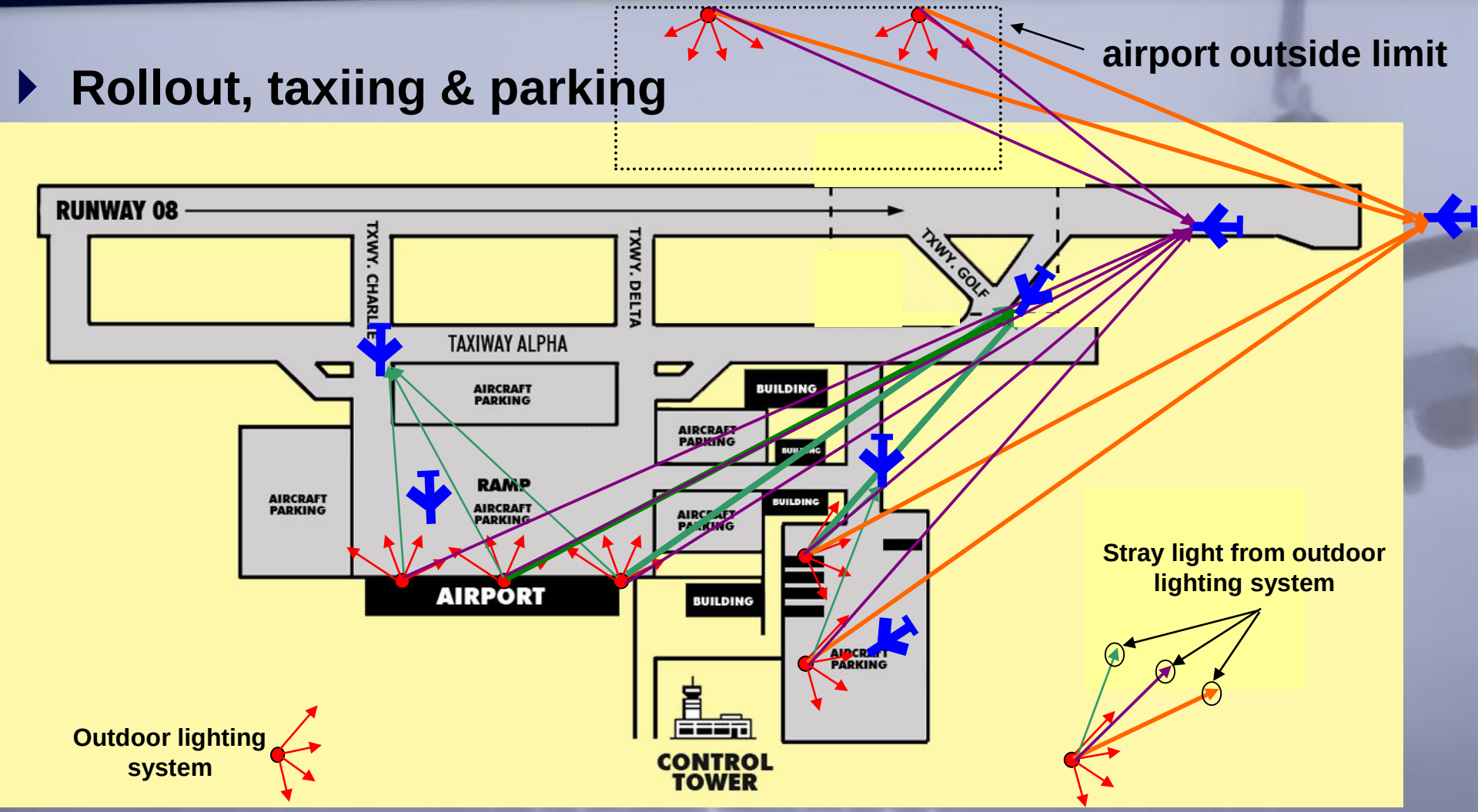
MAXIMUM INTENSITY OF LIGHT SOURCES MEASURED AT 3° ABOVE THE HORIZONTAL

ZONE A	0 cd
ZONE B	50 cd
ZONE C	150 cd
ZONE D	450 cd

Code of airport	Distance from threshold (m)	Width from centre line (m)
4	4500	750
3 & 2	3000	750
1	approach	approach

Visual Issues - Pilot

- **Rollout, taxiing & parking**



Visual Issues - Pilot

Design issues table

TABLE 4.1 - LIGHTING DESIGN SUMMARY

	Illuminance, Lux (Horizontal) - Average unless otherwise noted	Illuminance, Lux (vertical)	Luminance, Candela/m2	Uniformity Ratios (average to minimum)	Design Issues: Glare	Shadow	Appearance of space and Luminaires (Note a)	Color Appearance of objects (and color discrimination)	Identification of Faces	Identification of Objects	Use of Specific task lighting	Equipment Aesthetic Appearance	Height and Position of Poles	Security / Safety	Emergency Power			Footnotes on Special Considerations	Reference Section(s) in RP-37 text
Aprons; Commercial, General Aviation, Cargo, Hangar																			
Aircraft Stand	50	100		4:1	V	V	S	V	I	V	----	I	V	S	I a				
Passenger Loading and Unloading	50	20 b		4:1	V	V	I	S	I	I	S	S	V	V	I				
Baggage and Catering Loading and Unloading	50	20 b		4:1	V	V	S	S	S	V	I	S	V	I	I				
Cargo Facility Loading and Unloading	50	20 b		4:1	V	V	S	I	S	V	I	S	V	I	I				
Other Aircraft Stand Service Operations	50	20 b		4:1	V	I	S	S	S	I	S	S	V	I	I				
Mechanical checks, Maintenance and Repair	50	200		4:1	V	V	S	V	S	V	V	S	V	I	I				
Fueling Operations	50	20 b		4:1	V	V	S	V	S	I	V	S	V	I	I				
Engine Run-up/Test Area	100	100		2:1	V	V	----	V	----	V	S	----	V	----	----				
Other Airport Facilities																			
De-Icing Areas	20			4:1	V	V	S	V	I	V	V	I	V	S	I a				
De-ice Storage Facility and Truck Loading	100			4:1	S	S	S	S	S	I	I	S	S	S	S				
Fuel Facilities	50			4:1	S	S	S	S	S	I	I	S	S	S	I				
Ground Service Equipment (GSE) Areas	20			4:1	S	S	S	S	S	I	S	S	S	S	S				
Roadways, pedestrian ways																			
Departure, Arrival Areas	Coordinating with RP-8				I	I	V	V	V	V	V	S	S	V	I				
Walkways from Parking Facility to Terminal					I	I	V	V	I	I	S	I	S	V	S				
Surrounding Roadways					I	----	I	S	S	I	S	S	I	S	S				
Roadway Signage					V	----	S	V	----	----	----	V	S	----	S				
Secure Acess Point					V	V	S	V	V	V	V	I	I	V	V				
Parking																			
Surface Parking Lot/ Vehicle Staging Area	10			4:1	I	S	S	I	I	I	S	S	I	V	S				
Parking garage top level	10			4:1	I	S	S	I	I	I	S	S	I	V	S				
Toll plaza	20			4:1	V	I	S	I	I	I	V	S	S	V	I				
Other Exterior Lighting																			
Landscaping, façade illumination, etc.					V	----	V	V	----	I	S	V	S	S	S				

LEGEND

V VERY IMPORTANT
I IMPORTANT
S SOMEWHAT IMPORTANT
---- NOT APPLICABLE

a Subjective for each Airport
b Vertical Lumens at 2m

Specific Area Design Criteria

- Factors
  - Luminance and illuminance level & ratios
  - Glare
  - Shadow
  - Appearance of space and Luminaires
  - Color Appearance of objects (and color discrimination)
  - Identification of Faces
  - Identification of Objects
  - Use of Specific task lighting
  - Equipment Aesthetic Appearance
  - Height and Position of Poles
  - Security / Safety
  - Emergency Power

Specific Area Design Criteria - Design Issues

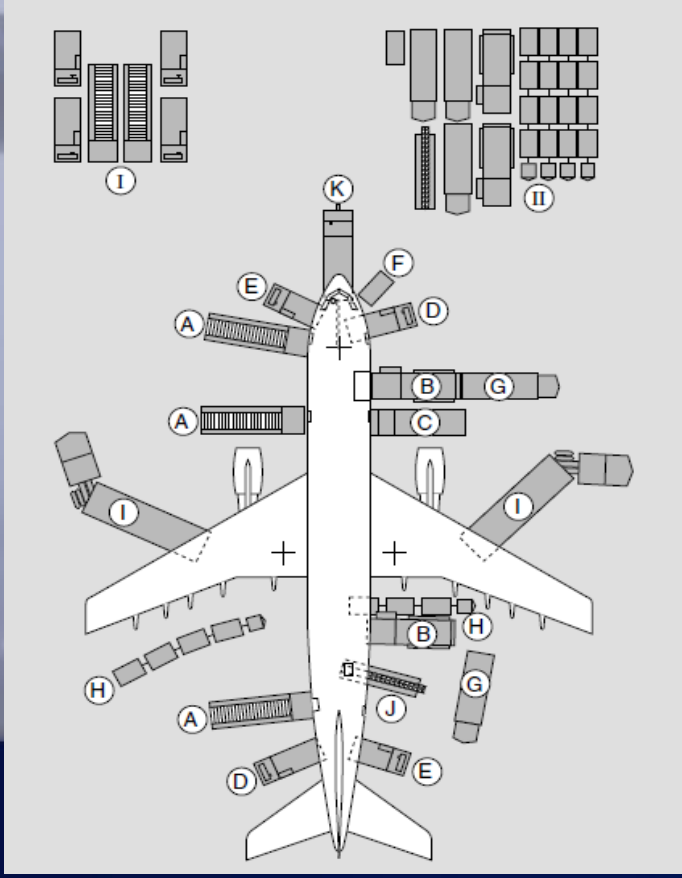
TABLE 4.1 - LIGHTING DESIGN SUMMARY

Design Issues

	Glare					Committee	Shadow					Committee	Appearance of space and Luminaires (Note a)					Committee	Color Appearance of objects (and color discrimination)					Committee	Identification of Faces					Committee	Identification of Objects					Committee	Use of Specific task lighting					Committee	Equipment Aesthetic Appearance					Committee	Height and Position of Poles					Committee	Security / Safety					Committee	Emergency Power					Committee
Aprons; Commercial, General Aviation, Cargo	V						S						-																																																						
Aircraft Stand	V		V	V	V	V	S		V	I	V	V	-		S	I	I	S	-		V	I	I	V	I		V	S	I	I	V		V	I	V	V	-	S	V	V	V	-	-	S	S	S	V	I	V	i	V	I	V	V	V	I	V	S	S	S	V	V	V	I
Passenger Loading and Unloading	V	S	V	V	V	V	S	I	V	V	V	V	-	I	S	I	I	I	I	I	V	I	I	S	V	I	V	I	S	I	V		V	I	I	I	-	I	S	I	V	S	-	S	S	S	V	S	V	-	V	S	V	V	V	I	V	V	V	V	V	S	I	V	V	V	I
Baggage and Catering Loading and Unloading	V	S	V	I	V	V	S	I	I	I	V	V	-	I	S	I	I	S	-	I	I	I	S	S	I	S	S	S	S	S	I	V	V	V	V	V	I	I	V	I	V	I	-	-	S	S	V	S	V	-	I	S	I	V	V	S	V	V	V	I	V	S	I	V	V	V	I
Cargo Facility Loading and Unloading	V	S	V	I	I	V	S	S	I	I	I	V	-	S	S	I	I	S	-	S	S	V	I	I	I	S	S	I	I	S	V	I	V	V	V	V	I		I	I	V	I	-		S	S	V	S	V		I	S	V	V	V		V	I	V	I	S		V	I	I	I
Other Aircraft Stand Service Operations	V		I	V	V	V	S		I		I	I	-		S		I	S	-		S		I	S	-		S		I	S	V		V		V	I	I		I		I	S	-		S		V	S	V		I		V	V	V		V	I	S		V		S	I
Mechanical checks, Maintenance and Repair	V	-	V		V	V	S		V	V	V	V	-		S	I	I	S	I		V	V	I	V	-		S	S	I	S	V		V	V	V	V	V	I	V	V	V	V	-	-	S	S	V	S	V		I	S	V	V	V	V	V	I	V	I	V	V	S	I	V	I	V	V	I
Fueling Operations	V	I	V	I	V	V	S	I	V	I	V	V	-	I	S	I	I	S	I	S	V	V	S	V	-	S	S	S	S	S	V	I	V	I	V	I	-		V	V	I	V	-		S	S	V	S	V	I	I	S	V	V	V		V	I	V	I	V		S		V	V	V	I
Engine Run-up/Test Area	V		-	I	-	V	S		-	I	-	V	-		-	I	-	-	-		-	I	-	V	-		-	S	-	-	V		-	I	-	V	-		-	I	-	S	-		-	S	-	-	V		-	S	-	V	V		-	I	-	-	S		-	V	-	-
Other Airport Facilities	V						S						-																																																					
De-Icing Areas	V	S	V	I	V	V	S	-	V	V	I	V	-	S	S	I	I	S	-	S	V	V	I	V	-	-	-	S	I	I	V	S	V	I	V	V	S	-	V	V	V	V	-	-	S	S	V	I	V	I	I	S	V	I	V	I	V	S	V	S	V	V	V	I
De-ice Storage Facility and Truck Loading	V	S	I	I	S	S	S	-	I	I	S	S	-	S	S	I	S	S	-	S	S	I	S	S	-	-	-	S	S	S	V	S	V	I	I	I	I	-	I	V	I	I	-	-	S	S	V	S	V	I	I	S	I	S	V	I	V	I	V	S	V	-	I	I	S	S
Fuel Facilities	V	S	V	I	I	S	S	-	V	V	S	S	-	S	S	I	S	S	-	S	V	V	S	S	-	-	-	S	S	S	V	S	V	V	I	I	-	S	V	V	I	I	-	-	S	S	V	S	V	I	I	S	I	S	V	I	V	V	V	S	V	I	V	V	I	I
Ground Service Equipment (GSE) Areas	V	S	I	I	S	S	S	-	I	V	S	S	-	S	S	I	S	S	-	S	S	V	S	S	-	-	-	S	S	S	V	S	V	V	I	I	S	-	I	V	I	S	-	-	S	S	V	S	V	S	I	S	I	S	V	S	V	I	V	S	I	-	S	I	S	S
Roadways, pedestrian ways	I						S																																																												
Departure, Arrival Areas	I	V	I	V	V	I	S	I	S	V	I	I	I	I	I	I	I	V	I	I	V	V	I	V	V	V	V	V	V	V	V	V	V	V	V	V	-	-	-	I	S	V	I	S	S	I	V	S	S	I	I	S	V	S	V	I	V	V	V	V	-	S	V	V	V	I
Walkways from Parking Facility to Terminal	I	S	I	V	I	I	S	I	S	V	I	I	I	I	I	I	I	V	I	I	V	V	S	V	V	V	V	V	V	I	V	V	V	V	V	I	-	S	-	I	S	S	I	S	S	I	V	I	S	S	I	S	V	S	V	I	V	V	V	V	-	I	V	V	V	S
Surrounding Roadways	I	S	V	V	V	I	S	I	S	V	S	-	I	I	S	I	I	I	I	I	I	V	S	S	V	S	-	S	S	S	V	S	V	I	I	I	-	-	-	I	S	S	I	S	S	I	V	S	S	I	I	S	V	I	V	S	V	V	V	S	-	S	V	I	I	S
Roadway Signage	I	V	V	V	V	V	S	I	V	V	I	-	I	I	-	I	I	S	I	I	-	V	I	V	V	V	-	S	S	-	V	V	-	I	S	-	-	V	-	I	S	-	I	S	S	I	V	V	S	I	S	S	V	S	V	V	V	-	-	I	V	I	I	S
Secure Acess Point	I	V	V	V	V	V	S	I	V	V	V	V	I	I	S	I	I	S	I	I	V	V	I	V	V	I	V	V	V	V	V	I	V	V	I	V	-	-	V	V	I	V	I	S	S	I	V	I	S	S	S	S	I	I	V	I	V	V	V	V	-	I	V	V	V	V
Parking	I						S						I						I																																															
Surface Parking Lot/ Vehicle Staging Area	I	V	I	V	V	I	S	I	I	V	S	S	I	I	I	I	I	S	I	I	V	V	S	I	V	V	I	I	I	I	V	V	I	I	I	I	-	-	I	I	S	S	I	I	S	I	V	S	S	-	I	S	V	I	V	V	V	V	V	-	S	V	V	I	S
Parking garage top level	I	V	I	V	V	I	S	I	I	V	S	S	I	I	I	I	I	S	I	I	V	V	S	I	V	V	I	I	I	I	V	I	I	I	I	I	-	-	I	I	S	S	I	I	S	I	V	S	S	V	I	S	V	I	V	V	V	V	V	-	V	V	V	I	S
Toll plaza	I	I	I	V	V	V	S	I	I	V	I	I	I	I	I	I	I	S	I	I	V	V	I	I	V	S	I	I	I	I	V	I	I	I	S	I	-	I	I	V	I	V	I	S	S	I	V	S	S	I	I	S	V	S	V	I	V	V	V	V	-	V	V	I	I	I
Other Exterior Lighting	I						S						I						I																																															
Landscaping, façade illumination, etc.	I	-		V	S	V	S	-		V	S	-	I	S		I	V	V	I	S		I	V	V	-	-		S	S	-	I	S		I	S	I	-	-		I	S	S	V	-		I	V	V	S	-		S	V	S	S	-		S	V	S	-	-		S	-	S

Specific Area Design Criteria - Results

- **Various criteria to debate!**
  - Light levels
    - CAA NZ Lighting should not be less 15 Lux measure on the aircraft parking spot
    - CASA Australia – Code 3C and smaller, lower light level on apron
- **Equipment position and tasks location**
  - Illuminance
    - Front
    - Back



Specific Area Design Criteria

ITAC – December 1998, chap 4, section 4-3-2

- **Various light level**
  - Challenges #1 – coordination among various authority
  - Challenges #2 – coordination among stakes holders

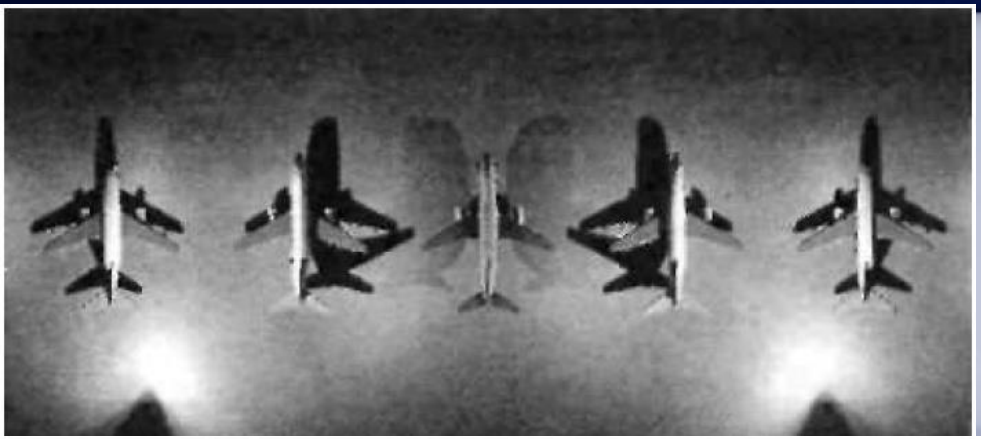
- **Experience -** Review and assess apron lighting

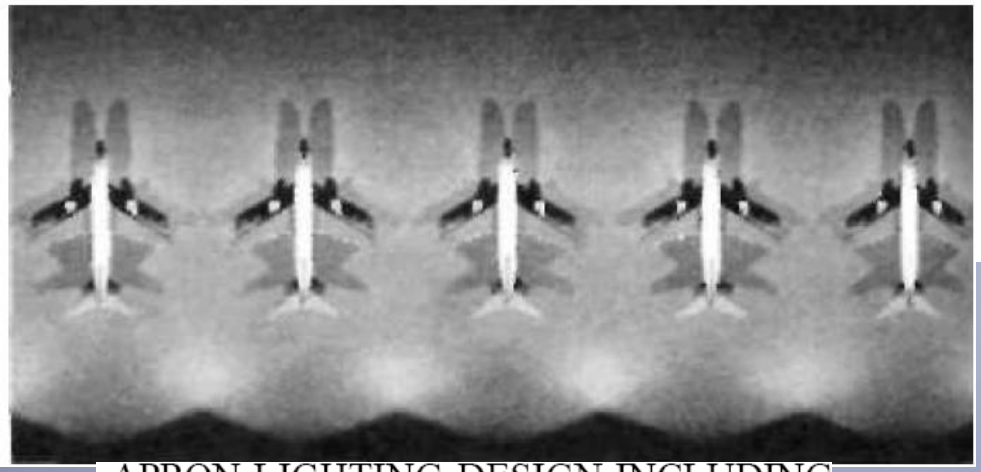
BAA

BAA - Performance Standard

''Remedial actions may include replacement of unserviceable/damaged lamps, cleaning of lamps, replacement of lamps with lamps of a different rating, re-positioning of lamps and ***re-siting of floodlight masts.*** *''*

Specific Area Design Criteria





APRON LIGHTING DESIGN INCLUDING AIRCRAFT SHADOWS

A. A. Bartsev

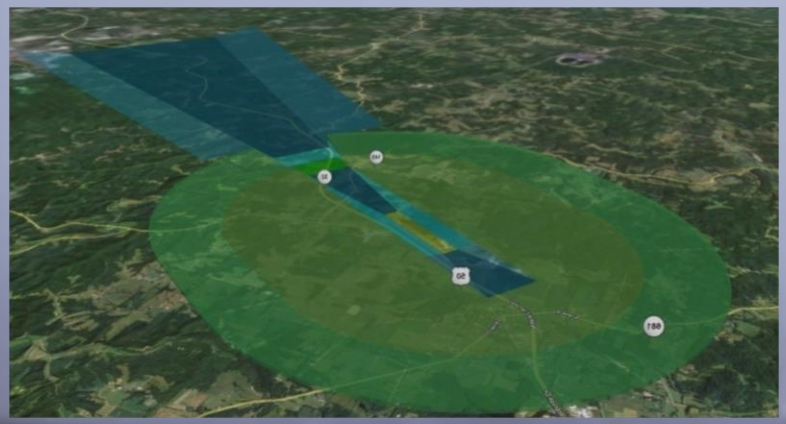
Number of masts	Number of floodlights per mast	Comparative total cost (in%)	Average illuminance (lx)		$K_S=E_2/E_1$
			E_2 (with aircrafts)	E_1 (without aircrafts)	
2	7	38	17.8	22.6	0.79
3	5	53	20.5	25.0	0.82
4	3	68	21.6	26.9	0.80
6	2	100	19.9	21.5	0.93

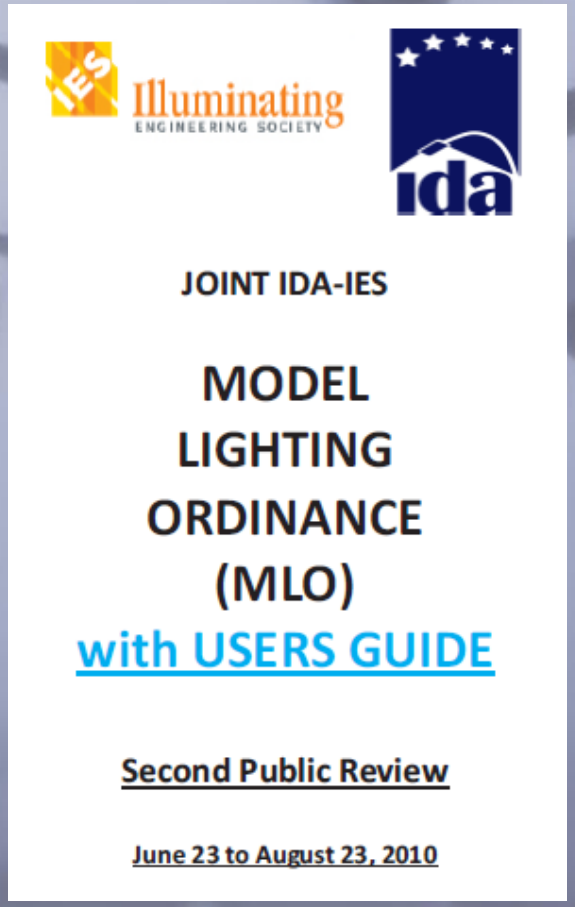
$$Ks = \frac{\text{E with aircrafts}}{\text{E without aircrafts}}$$

$$Ks > 0.85 \text{ to } 0.90$$

Specific Area Design Criteria - Shadow

- Model Lighting Ordinance (MLO) concept
  - Second public review ended August 2010
  - ‘’Overlay zoning’’
  - *“Eye illuminance”* LZ0 – LZ4
    - values 0, 1, 3, 8 and 15 Lux
  - Prescriptive or performance method
  - Adaptation for each area of the airport





Environmental Condition and Sustainable Development

IESNA RP-37-XX

Outdoor Lighting for the Airport Environment
Revision 1 – 11/16/09

Release of any draft documents to any person, not a member of the authoring committee, requires prior written approval from the subcommittee or task force Chair.

Following approval to solicit outside opinion or comment, the committee member must communicate in writing to the outside expert that the material is copyright IESNA and is for the recipient's use only and may not be redistributed to anyone else without permission.

Comments for this Recommended Practices must be filled with the appropriate form check at http://www.iesalc.org/subcommittees_recpractices.html

The deadline for comments is January 5th 2010.

Other documentation available at IESALC web site.
http://www.iesalc.org/subcommittees_recpractices.html

Other comments or question can be sent to practices@iesalc.org

DRAFT

Prepared by:

The Recommended Practices Subcommittee
of the IESNA Aviation Lighting Committee

RP37 document for comments

Name:		Date (MM / DD / YYYY)	Document: IESNA-RP-37 "Recommended Practice for Outdoor Lighting for the Airport Environment"
Company/Organization:			
Email:			
Phone Number:			

VOTE FOR RP-37				
	APPROVE	APPROVE WITH COMMENTS	DISAPPROVE	ABSTAIN
YOUR VOTE- MARK SELECTION WITH AN 'X'.				

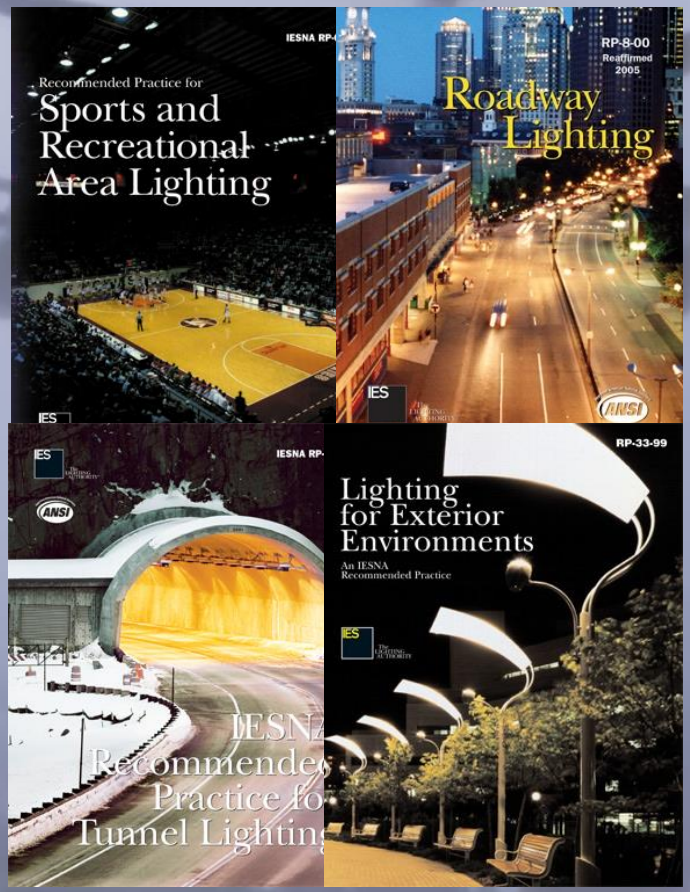
Reviewer	Section	Paragraph Figure/ Table	Type of comment (General/ Technical/Editorial)	COMMENTS	Proposed change	Action Taken By Subcommittee on each comment submitted

Comments sheet

- Document to be sent for comments
- Health and safety requirement harmonization
- ACI & ICAO update
- Pilot point of view & adjustment
- ATCT point of view & adjustment
- Review for military use
- IESALC approval from board
- IESNA technical review and approval from board

Action plan

- **RP-37 FRONT COVER PAGE**
  - Rules :
    - Must show light in airport environment
    - One picture per submittal
    - Must fill the release form
    - Send to **practices@iesalc.org**
    - No later than January 31st 2011



Action plan

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Government Contacts (E-MAIL)	Donald Gallagher	FAA Technical Center
General Aviation (E-MAIL)	Mac McIver	Washington State Aviation, *retired*
Recommended Practices (E-MAIL)	Richard Larivée	Avia Rupta Solutions Inc.
Awards (E-MAIL)	Gayle Gorman Freeman	Manairco, Inc.
Maintenance Subcommittee (Steering Group) (E-MAIL)	[illegible] Rainey	Navaid Lighting Associates, Inc.

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Questions?

Comments?

Richard Larivée, Chair IESNA RP-37
IESALC recommended practices subcommittee
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