

## UNEP-*lites.asia* Laboratory Training Workshop Beijing, China 22-24 April 2015



**UNEP Collaborating Centre for Energy Efficient Lighting** 









# **Introduction to Inter-laboratory Comparison**

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## Table of Contents

#### What is the Interlaboratory Comparison?

2 Why should we do the Interlaboratory Comparison?

3 Our experiences to share



### What is the Interlaboratory Comparison ?

ISO/IEC 17043:

#### [Interlaboratory Comparison]

Organization, performance and evaluation of measurements or tests on the same or

similar items by two or more laboratories in accordance with predetermined conditions.

#### Same or Similar Items:





#### **Different laboratories:**





### What is the Interlaboratory Comparison ?

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### What is the Interlaboratory Comparison ?

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#### Star-type and Round-type





### What is the Interlaboratory Comparison ?

#### Who are involved?

Nucleus lab- organization which takes

responsibility for the development and operation

of an Interlaboratory Comparison.

Participant – laboratory, organization or individuals, that receives test items and submits results for review by the Nucleus lab





### Who is the coordinator?

One or more individuals with responsibility for organizing and managing all of the activities involved in the operation of an Interlaboratory Comparison scheme.





## Table of Contents

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a) Evaluation of the performance of laboratories for specific tests or measurements and monitoring laboratories' continuing performance;

b) Identification of problems in laboratories and initiation of actions for improvement which, for example, may be related to inadequate test or measurement procedures, effectiveness of staff training and supervision, or calibration of equipment;

c) Establishment of the effectiveness and comparability of test or measurement methods;

d) Provision of additional confidence to participant;

e) Identification of interlaboratory differences;



f)Education of participating laboratories based on the outcomes of such comparisons;

g) Validation of uncertainty claims;

h) Evaluation of the performance characteristics of a method — often described as collaborative trials;

i) Assignment of values to reference materials and assessment of their suitability for use in specific test or measurement procedures; and

j) support for statements of the equivalence of measurements of National Metrology Institutes through "key comparisons" and supplementary comparisons conducted on behalf of the International Bureau of Weights and Measurement (BIPM) and associated regional metrology organizations.



## Table of Contents

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> Until now, we have organized 10 IC activities, participating labs involve 20

#### countries and 68 labs.





#### >2013 IEA IC

This project was operated by four nucleus laboratories covering different regions of the world. Our lab was one of the nucleus labs to organize 14 labs' testing activities.



**14 labs from:** Australia, China Mainland, China Hong Kong, China Taiwan, New Zealand, Sweden.

#### 5 types of samples:

Incandescent lamp; Omnidirectional LED lamp; Directional LED lamp; High CCT LED lamp; Low power-factor LED lamp

#### **Properties Measured**

Photometric parameters; Eletrical parameters; Color parameters



#### >2013 APLAC IC

In 2013, the APLAC IC was organized by China National Accreditation Service for Conformity Assessment (CNAS) and us, intent to make an investigation on the lighting products measurement capacity of the laboratories in different countries and regions





parameters



#### >2014~2015 Southeast Asia IC

This comparison test (CT) is one of a series of efficient lighting compliance activities under the UNEP "Securing climate change benefits of efficient lighting in Southeast Asia and Pacific economies via MVE capacity building activities", which is funded by the Australian government.



6 labs from: Indonesia(2); Vietnam(2); Thailand(1); Philippines(1).

#### 3 types of samples:

Omnidirectional LED lamp; Directional LED lamp; High CCT LED lamp

#### **Properties Measured for Comparison**

Photometric parameters; Color parameters



#### > Inter-laboratory comparison testing with Russian laboratories

The artifacts comparison test was carried out between Global Efficient Lighting Centre (GELC) and 4 Russian laboratories, which aims to enhance the cooperation between the global UNEP/GEF en.lighten initiative and its partners on acceleration of global market transformation to environmentally sustainable lighting technologies.

### **3 types of samples**

- •Omnidirectional LED lamp;
- Incandescent lamp;
- Constant currentIncandescent lamp

Photometric parameters;

**Electrical parameters; Color** 

parameters





#### **First TEAS IC**

#### Technical Evaluation Alliance for Solid-state Lighting, TEAS





#### ➢ First TEAS IC

This activity was organized by GELC in 2014, aiming at improving the capacity of labs through a series IC activities, trainings.....



#### **19 labs from** the main lighting test labs of TEAS members in china.

### 2 types of samples

Omnidirectional LED lamp;

• Directional LED lamp.

Photometric parameters; Electric parameters; Color parameters







#### **>**Twice inter-laboratory comparison testing with Jordan laboratory

Twice IC activities were organized by GELC with Jordan lighting lab in 2014 and 2015.





#### 2 types of samples

Incandescent lamp;

•Omnidirectional LED lamp.

Photometric parameters; Electric; Color parameters











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Technical work

#### TEST

Follow the IC protocol and measurment method strictly





Four-terminal method

**General method** 

AC/DC ?

**Control: Voltage /Current** 

Lamp base position: Down/UP/.....

**Stability check** 

**Circuit diagram** 

.....



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Technical work

**REPORT** Follow the IC protocol Significant digits of data.

Unit of data.

.....

Uncertainty or relative uncertainty.

Detailed information of standard lamp.

Detailed information of equipments.

Diviation

Analysis



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Management

> Check and confirm the equipments, lab's conditions and time availability

before participate in the IC activity.

**>**Report the situations of sample promptly.

	Situat	0115 01	samples
Lab for Sending	B4T - Center for Material and Technical Products	Sender	ZHANG Debao
Date and time			2014/1/29
Package check	Normal		
	C Abnormal, Description		Pictures
Samples check (appearance)	Normal		8 8 6
	Abnormal, Description		Pictures
Samples check (lighting)	Normal		ring)
1	Abnormal, Description		Pictures (Burning)



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Management

**>** Take care of the package for transportation, and conditions in shipment.





➤Track the shipping process with express company and Custom House to avoid any losing or extra costs.



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# Schedule

N0.	Event	Period
1	Prepare the documents	2015.3~2015.6
2	Prepare the samples	2015.02~2015.11
3	Inform the participant labs	2015.12~2016.2
4	Dirstribute the samples	2016.5~2016.06
5	Test by participants	2016.06~2016.12
6	Data analysis	2017.01~2017.4
7	Confirm report	2017.05~2017.12
8	Final report	2018.01~2018.05



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2014~2015 Southeast Asia IC

Omnidirectional LED lamp	Directional LED lamp	High CCT LED lamp
	ÉLC-Ó-L	TOGLG-itug-it



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#### 2014~2015 Southeast Asia IC

### **Schedule**

N0.	Event	Period
1	Samples preparation (GELC)	Aug-Nov 2014
2	Samples distribution (GELC)	Dec 2014
3	Comparison testing with the laboratories	Jan 2015
4	Second testing with GELC	Jan-Feb 2015
5	Statistical analysis of results (GELC)	Feb 2015
6	Formal Confirming Report to participants and UNEP	Apr 2015
7	Summary report to participants and UNEP	May 2015
8	Explain the results and answer questions (GELC)	May 2015



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2015~2016, GELC will organize the second time TEAS IC activity. Aim to improve the capacity of labs through a series IC activities, trainings.....

#### 2015~2016 Second IC

### Schedule

N0.	Event	Period
1	Prepare the documents	2015.3~2015.6
2	Prepare the samples	2015.03~2015.7
3	Inform the participant labs	2015.07~2015.08
4	Dirstribute the samples	2015.09
5	Test by participants	2015.09~10
6	Data analysis	2015.10~2015.11
7	Final reportConfirm report	2016.12





### Thank you for listening and for... any Comments or Questions?



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