

# Development of National Standards on LED

Presentation by:

R K TREHAN

Sc F & Head ( Electro-technical Department)

Bureau of Indian Standards, New Delhi





## CONTENTS

- Process of Standard development in India
- Development of Indian Standards on LED
- Latest status of various IEC standards/projects on LED
- Implementation of Standards



# WHY STANDARDS ?

- ✓ Standards are essential for all human activity
- ✓ But most people take them for granted



# NEED FOR STANDARDS?

Only when products fail to  
work





# NEED FOR STANDARDS ?

or mishaps occur, we do think of standards!



Even in business, where money is at stake, standards are often given a low priority



## MISCONCEPTION OF PEOPLE ABOUT STANDARD:

- More constraints
- More things to comply with
- More cost
- Excludes my products from other markets
- Stifles innovation



# BUREAU OF INDIAN STANDARDS

- **The National Standards Body of India**
- **Bureau of Indian Standards (BIS) took over work of Indian Standards Institution (ISI) through enactment of *BIS Act (1986)* by the Indian Parliament**
- **ISI was set up in Jan 1947 by a resolution of the Parliament**

# TECHNICAL COMMITTEE STRUCTURE







# APPROACH TO STANDARDIZATION

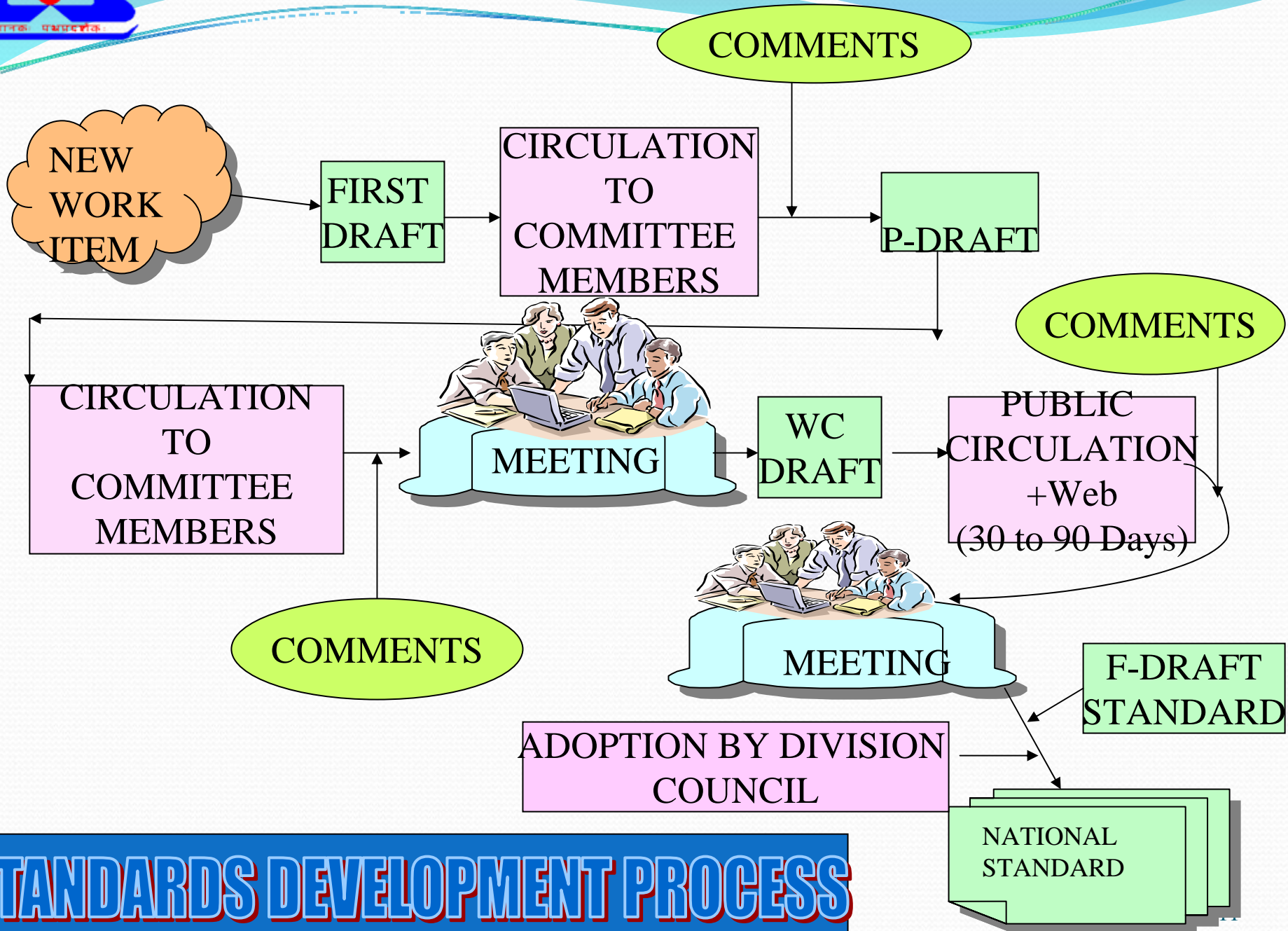
Consultations involving all Stakeholders

Documents sent for public comments before finalization

Consensus Principle

Balanced Committee Structure

Compliance of WTO/TBT Principles



# STANDARDS FORMULATION

**PRESENT  
FOCUS**

**NEED BASED &  
DEMAND DRIVEN STANDARDS**

**TIMELY  
UPDATION**

**HARMONISATION WITH  
INTERNATIONAL  
STANDARDS**

**FASTER DEVELOPMENT  
OF STANDARDS**

## VITAL STATISTICS (May 2011)

STANDARDS PUBLISHED		18613
TECHNICAL COMMITTEES		314
TECHNICAL EXPERTS		>12000
TIME TAKEN TO FORMULATE INDIAN STANDARDS	PRIORITY ONE	12 MONTHS
	PRIORITY TWO	24 MONTHS
	OTHERS	28 MONTHS



# LIGHTING COMMITTEES

ET 23 – Electric Lamps and their Auxiliaries

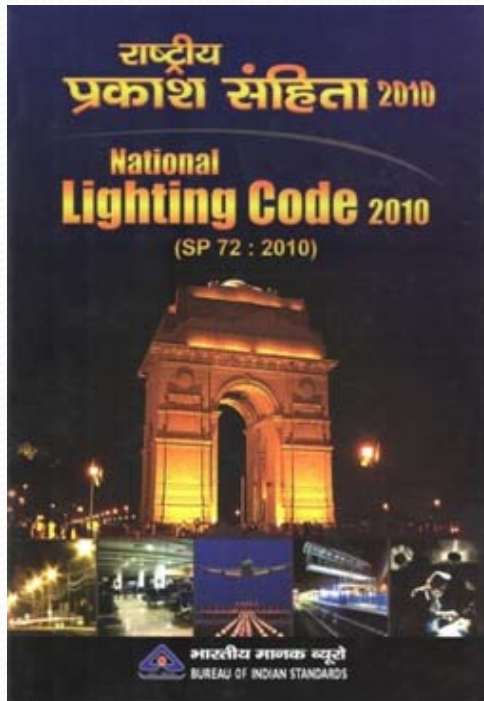
ET 24 – Illumination Engineering and Luminaires)

**Panel on LED formed in June 2010**



## INDIAN STANDARDS ON LIGHTING

➤ Lamps	29
➤ Controlgear	10
➤ Test method	3 (Lamps)
➤ Test Method	4 (Luminaire)
➤ Code of Practice	17
➤ Lighting Fittings	16
• <b>Total</b>	<b>91</b>



**A One step Solution to  
all of lighting  
technology**





# NEED FOR STANDARDS ON LED

*Widespread demand from all stake holders*

*Prospect for huge energy saving – potential mass use of LED products*

*Availability of wide varieties in market place vis-à-vis cost*

*Need to define quality characteristics*

*Need for quality monitoring.*



## ADVANTAGES OF LED

- Green technology
- Long source life (light output degrades 25-30 % after 11 years of continuous operation)
- High lumen efficiency
- Low maintenance
- No moving parts
- Low power consumption
- Little heat; no radiated heat from light
- Natural coupling for digital control
- Non-insect attracting
- Fast response



# PROBLEMS FACING LED INDUSTRY

- Some low quality product in market affecting confidence of users
- Unsubstantiated and inaccurate quality claims
- Lack of confidence of designers on SSL products
- Inadequate information on product performance
- Very high initial cost



# COMPLEXITY OF STANDARD DEVELOPMENT ON LED

***LED technology has not yet  
been stabilized***



***Advancement taking place at breakneck pace***

*Any standards developed, by that time technology make it  
inadequate*

*Standard development process has to keep pace with  
technology development*

*Laboratories will have to make provision for such change.*



## COMPLEXITY OF STANDARD DEVELOPMENT ON LED (2)

- What's the average rated lamp life for LEDs?
- Do LEDs really operate for 100,000 hours?
- How do we test and predict life of LED?

# CHALLENGES OF LED STANDARD MAKING

***Life- LED has a long rated life – upto 50000 hr or more. Even with 24X7 operation, testing of led would take 5.7 years (for 50 khr)***

***Concept of “Useful life” introduced in the standard – depreciation upto 70% of initial lumen***

*An accelerated life test for 2000 hr has been introduced*

***Eye Safety – High-powered LEDs(multi-chip LED arrays) can cause thermal heating effect which can damage tissues in retina***



# INDIAN STANDARDS ON LED

Sl. No.	Title of standard	Corresponding International Standard	Degree of Equivalence
1	Terms and definitions	IEC 62504 TS	Identical
2	Self-ballasted Led-lamps for general lighting services Part 1 - safety requirements	IEC 62560	Modified
3	Self-ballasted Led-lamps for general lighting services Part 2 Performance requirements	IEC 62612	Modified
4	Led modules for general lighting– Safety specifications	IEC 62031	Modified
5	Led modules for general lighting Part 2 performance requirements	IEC 62717	Modified
6	Lamp control gear Part 2 Particular Requirements Section 13 d.c. Or a.c. Supplied electronic control gear for LED modules	IEC 61347-2-13	Modified



# INDIAN STANDARDS ON LED

Sl. No.	Title of standard	Corresponding International Standard	Degree of Equivalence
7	dc or ac supplied electronic control gear for Led modules – performance requirements	IEC 62384	Modified
8	Method of measurement of lumen maintenance of solid state light (led) sources	LM 80	Equivalent
9	Electrical and Photometric Measurements of Solid-State Lighting Products	LM 79	Equivalent
10	Led luminaires for general lighting purposes part 1 safety requirements	34D/950/NP	Modified
11	Led-luminaires for general lighting Part 2 Performance requirements	34D/977/DC	Modified
12	Photobiological Safety of LED and LED systems	IEC 62471	Identical



# HIGHLIGHTS OF INDIAN STANDARDS ON LED

***All standards made applicable for voltages upto 250 v d.c. and 1000 v a.c. at 50 Hz***

***Operating voltage from 90 % to 110 % of rated voltage***

*Standard life of 25000 h, New category of CCT value added, Some tolerance values increased*

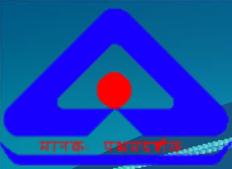
***Life greater than 25000 h can also be declared;***



## MAIN DIFFERENCES WITH IEC

- Schedule and sequence of type test and acceptance test added
- Selection of sample added
- Conditions of compliance included
- Requirements of pf added
- Life test requirement added
- Additional marking on lamp





## STANDARDIZATION AT IEC

- TECHNICAL COMMITTEE IEC/TC 34
- SUB COMMITTEES
  - SC 34 A for Light Source
  - SC 34 B for Lamp Cap
  - SC 34 C for Controlgear
  - SC 34 D for Luminaire
- INDIA IS A PARTICIPATING MEMBER IN ALL THESE COMMITTEES



## PUBLISHED INTERNATIONAL STANDARDS (IEC)

- IEC 62031(2008)-LED modules for general lighting - Safety specifications
- IEC 62560 (2011)- Self-ballasted LED-lamps for general lighting services by voltage  $> 50 V$  - Safety specifications
- IEC PAS 62612 (2009) -Self-ballasted LED-lamps for general lighting services by voltage  $> 50 V$  - Performance specifications
- IEC TS 62504 (2011) – LED Terms and Definition
- IEC PAS 62707-1: LED Binning-General requirements and White Grid
- **IEC 62384** (2006) DC or AC supplied electronic control gear for LED modules - Performance requirements



# OTHER LED STANDARDS UNDER DEVELOPMENT IN IEC

- LED Luminaires
- LED Binning
- LED Definitions
- LED lifetime prediction
- OLED
- Double-capped retrofit LED lamp

## IMPLEMENTATION OF STANDARDS

- BIS operates ISI mark scheme



- Other certification mark schemes operated by BIS are:
  - Hall Marking
  - Management System Certifications

**THANK YOU FOR KIND  
ATTENTION**

