Subject Code: TMI-103
Course Title: Tinkering and Mentoring

Topic : Bureau of Indian Standards

*Standardization – THE ESSENCE OF CIVILAZATION**

by
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* a part of the content of this presentation supplied by BIS

Content

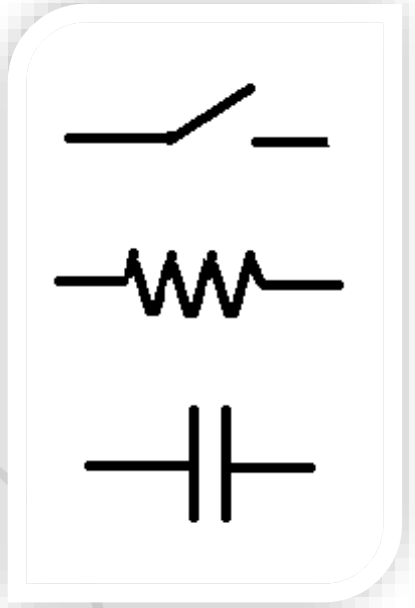
Introduction to Bureau of Indian Standards (BIS)

- Objectives, roles and functions of BIS
- Bureau of Indian Standards Act: roles and functions of BIS
- Purpose of standardization, marking and certification of articles and processes
- Importance of Standards to industry, policy makers, trade, sustainability and innovation

What do these represent?

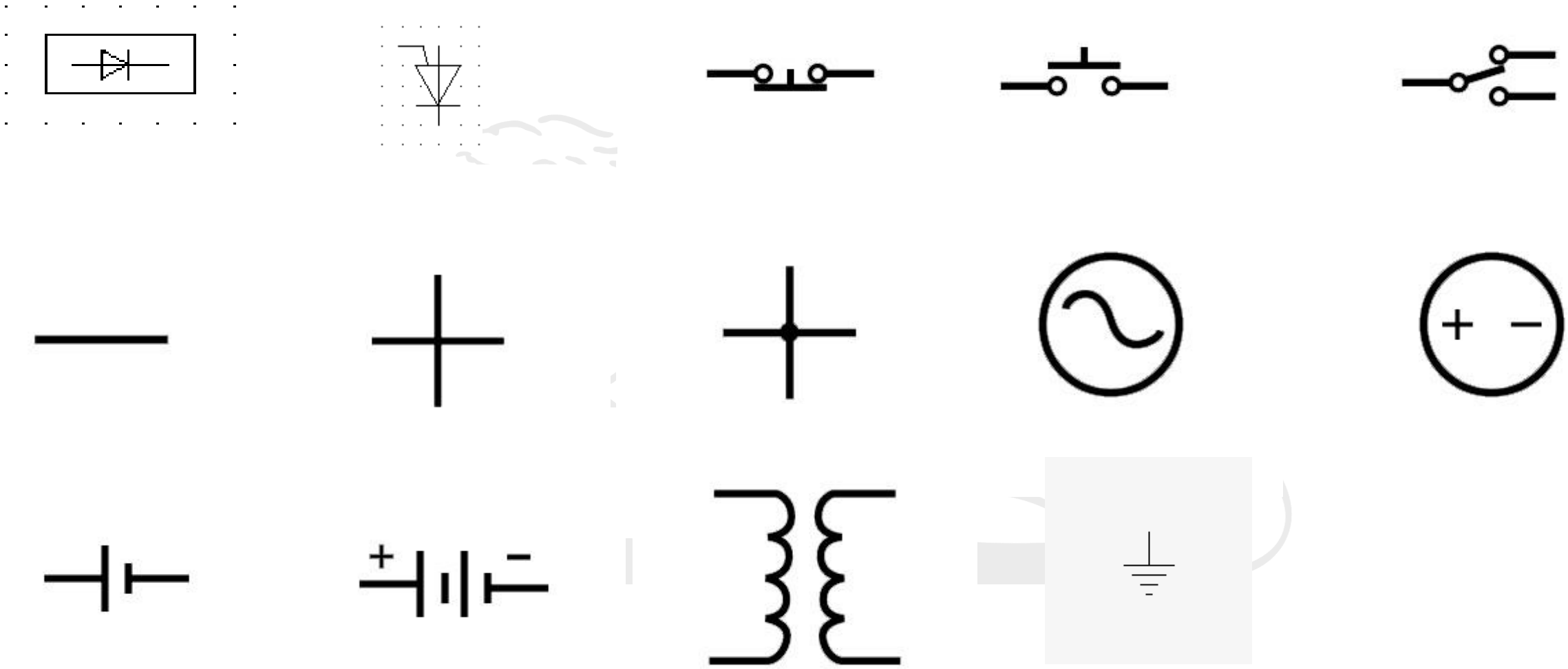
IEC 60417

ISO 7010



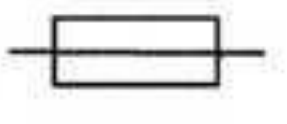
IEC 60617

What do these represent?



LET'S TAKE A QUIZ

- The following circuit symbol is a ____



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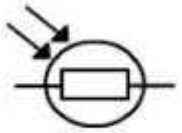


You are surrounded by standards .....

- The water you drink… ***IS 14543, IS 15500 ….***
- The steel you use… ***IS 2062, IS 1786 ….***
- The jewellery you wear… ***IS 1417, IS 1418 ….***
- The toys you play with… ***IS 9873, IS 15644 ….***
- The concrete that binds… ***IS 456, IS 1343, IS 4926 ....***
- The paint that shines… ***IS 2932, IS 428, IS 15489 ….***

Standards are everywhere…

Have you ever thought…

- Why there are standard traffic signs irrespective of the state you travel?
- How you are able to swipe your debit or credit card in any ATM machine here or abroad?
- How your pen drive fits to any laptop/PC you wish to use it in?
- How we are able to seamlessly communicate with each other across the globe?
- Why we do not have to bother about the brand of lamp/bulb we buy to replace the one in use?
- How we are able to get electric power with limited deviations in voltage/frequency in our homes/offices?

Standards have made our life easier…

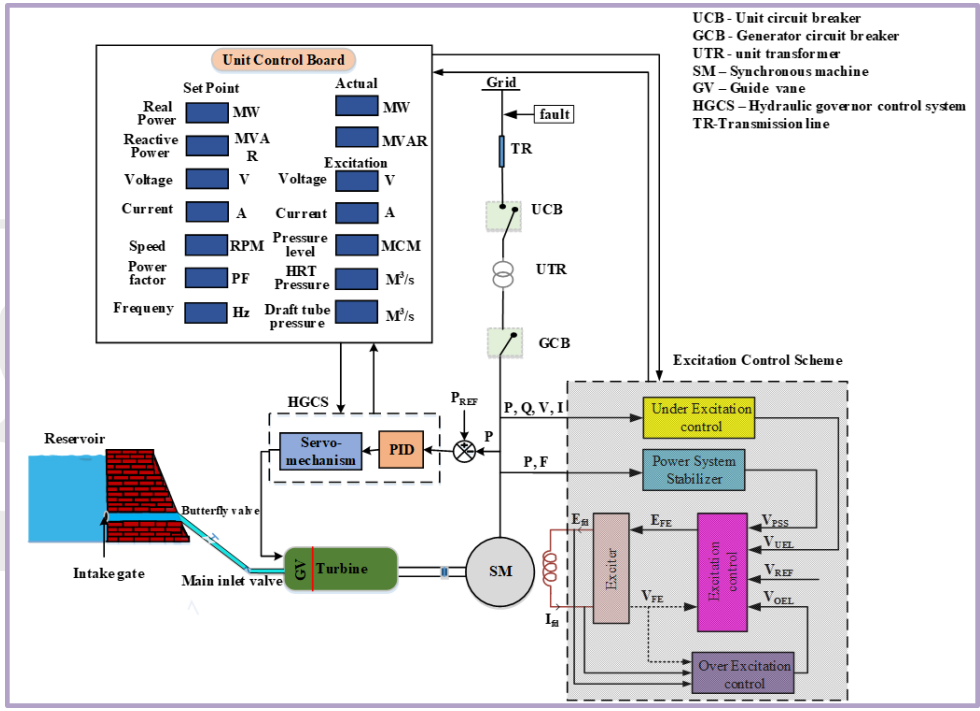


Fig. Hydraulic and excitation system of a single machine system

The Great Baltimore Fire (7– 8 Feb 1904)

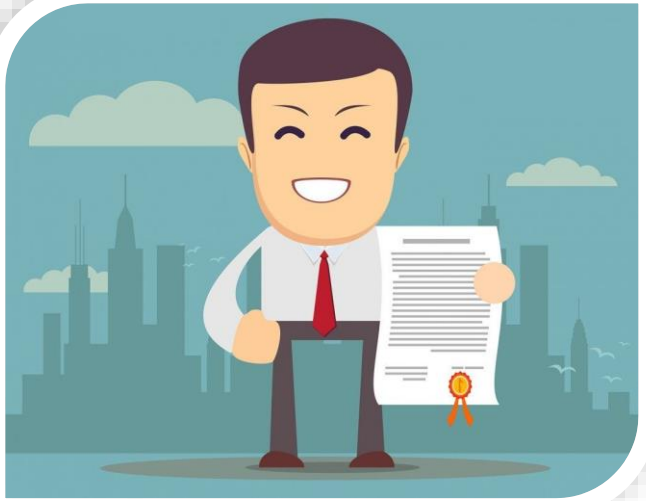
- The fire burned over 30 hours, destroying 1,545 buildings spanning 70 city blocks amounting to over 140 acres (57 ha).
- One reason for the fire's duration was the lack of national standards in firefighting equipment. Fire crews and fire engines came from far away with their own equipment. Most could only watch helplessly after discovering that their hoses could not connect to Baltimore's gauge size of water hydrants.

Mars Climate Orbiter Failure (23 Sept 1999)

- The primary cause of this discrepancy was that one piece of ground software supplied by Lockheed Martin produced results in a United States customary unit, contrary to its Software Interface Specification (SIS), while a second system, supplied by NASA, expected those results to be in SI units, in accordance with the SIS. Specifically, software that calculated the total impulse produced by thruster firings produced results in pound-force seconds. The trajectory calculation software then used these results – expected to be in newton-seconds – to update the predicted position of the spacecraft.

What are Standards?

- The rules or agreed way of doing, thinking about or managing something. It could be about a product, managing a process, delivering a service or supplying materials
- Agreement developed by several people/parties with the intent that all parties comply
- A combined wisdom of people with expertise in their subject matter & who know the needs of the concerned interests



Why Do We Need Standards?

- To define & raise level of quality, safety & health and protect environment.
- To facilitate transfer of technology.
- To disseminate good management and business practices.
- To assess and demonstrate conformity.
- To provide market access for products and services.
- To provide consumer choice.
- To support Government policies and legislation.
- To build relations between economic players.

What do we Aim at?

- Variety control
- Compatibility
- Interchangeability
  - Functional
  - Dimensional
- Protection of health
- Safety
- Protection of the environment
- Product protection

Dam for hydropower project

Battery for mobile phones

ELCB

Consider a world without standards…

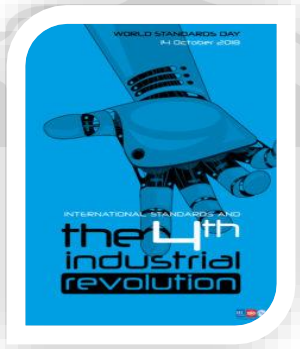
Zero Trust

Environment Degradation

Miscommunication

Low Quality of Living

Slow Technological Advancement



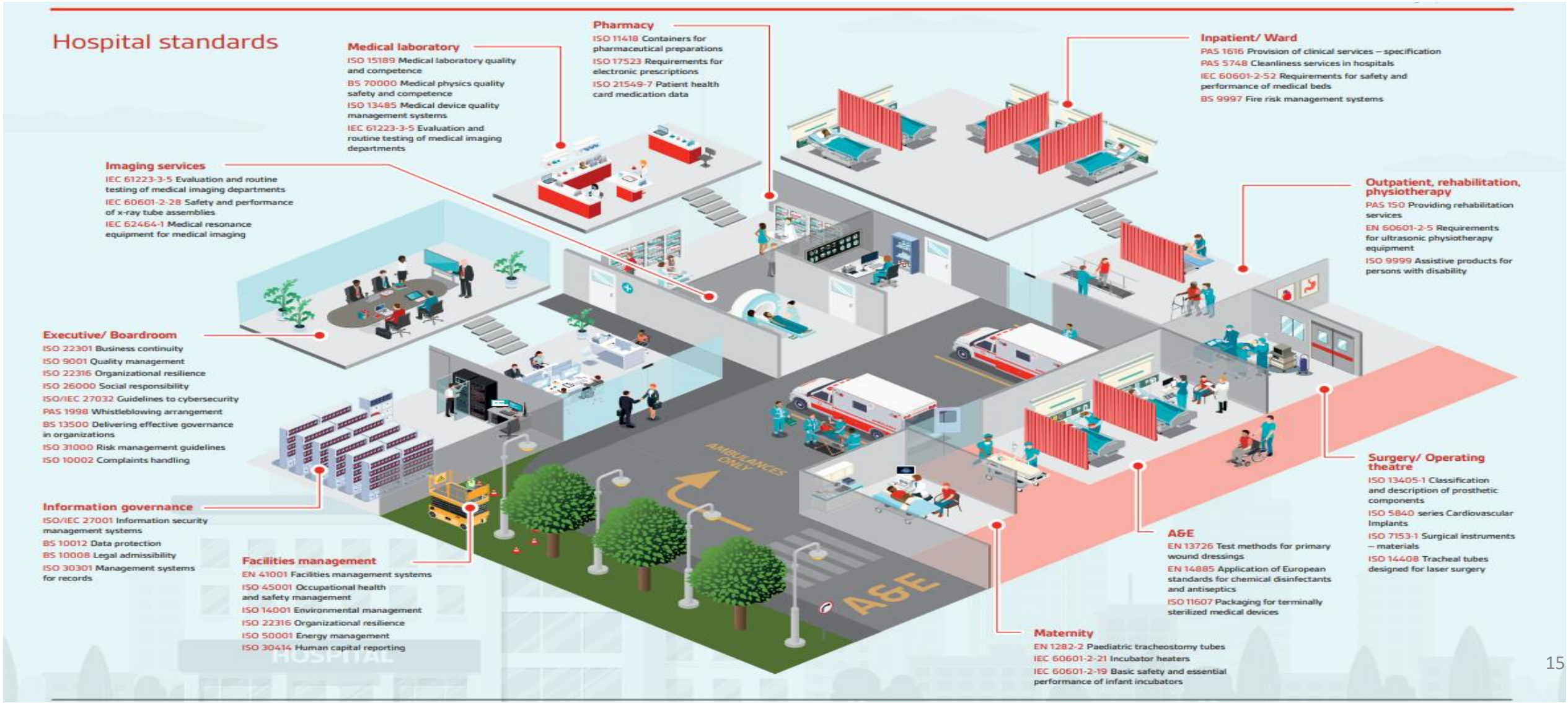
Do you know?

- There are standards on methods of test…
- There are code of practices …
- There are guidelines standards…
- There are standard on terminology…
- There are standards on services…
- There are standards for systems…
- There are standards for safety…

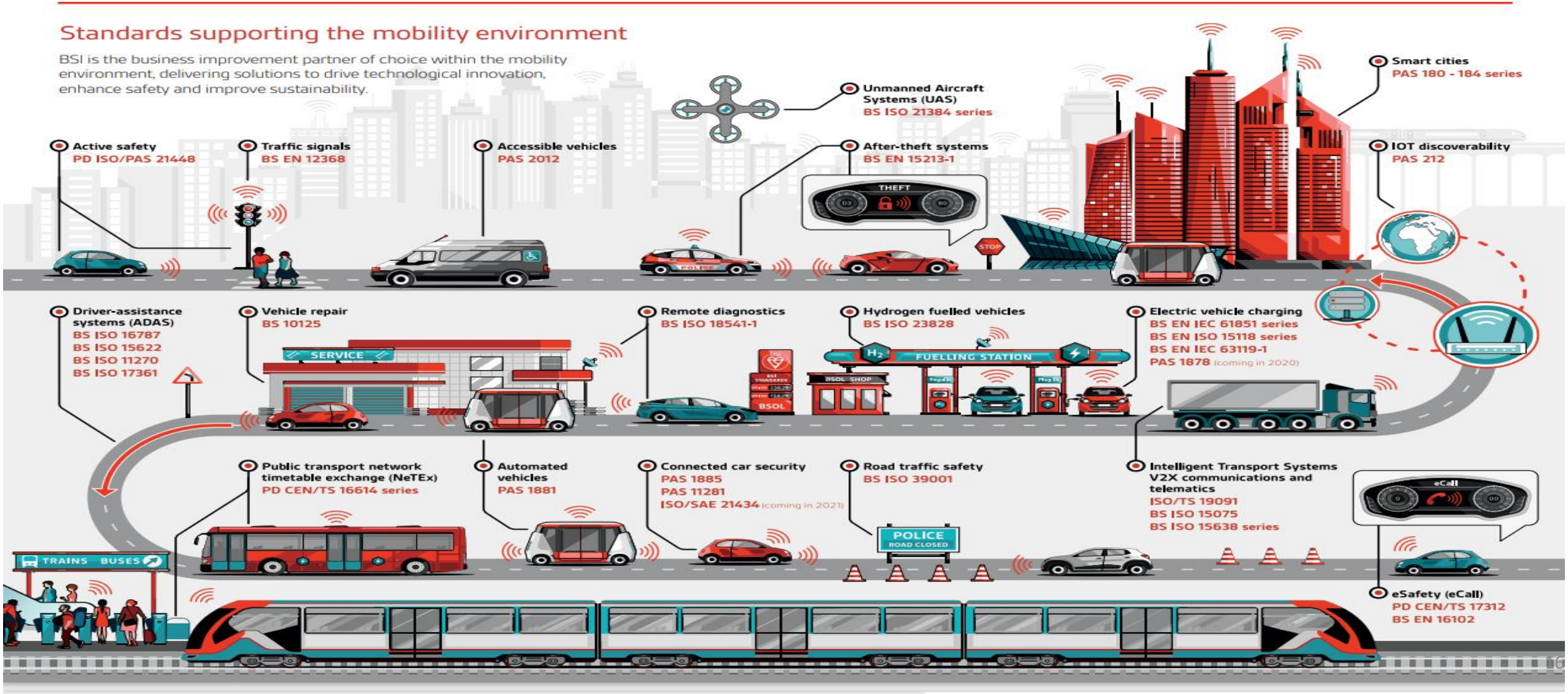
IS 1391 (PART 2) : 1992
ROOM AIR CONDITIONERS

Standards are not just for products……

Standards in our daily lives



Standards in our daily lives



Standards supporting mobility

Classroom We Sitting In

IS 2694:2018
School chalks, moulded, white

IS 4222:2018
Coloured chalks, moulded

IS 4837:1990 School furniture, classroom chairs and tables - Recommendations

LET'S TAKE A QUIZ

1

2

3

4

5

Original ISI mark with proper Central Mark license Number

Criticism On Standards

- Not flexible
- Unrelated to conditions in particular places
- Often arbitrary
- Developed and used without regard to their economic implications
- They inhibit innovation

Topic 2 : Standardization Process In BIS

Principles of Standardization

1. Transparency	• Easy accessibility of information, work programs • Adequate time & opportunity for all interested to participate & comment.
2. Openness	• Participation in standards development open to all. • Procedures publicly available.
3. Impartiality & Consensus	• No bias against or in favor of any specific stakeholder. • Decision making through consensus.

ISO/IEC Guide 59: 2019 – ISO and IEC recommended practices for standardization by national bodies

Principles of Standardization (Continued)

4. Effectiveness & Relevance	• Due consideration of latest technological developments. • Periodic review.
5. Coherence	• Avoiding duplication, overlap and contradictions. • Coordination between Standards Development Organizations: Harmonious Standards Development
6. Development Dimension	• Engaging potentially underrepresented interested parties. • Improving accessibility of information.

ISO/IEC Guide 59: 2019 – ISO and IEC recommended practices for standardization by national bodies

BIS Structure

Administrative & Advisory Work

Technical & Advisory Work

Technical Work

Technical Committees

DIVISION COUNCILS

- CIVIL ENGINEERING
- CHEMICAL
- ELECTROTECHNICAL
- FOOD & AGRICULTURE
- ELECTRONICS & INFORMATION TECHNOLOGY
- MECHANICAL ENGINEERING
- MANAGEMENT SYSTEMS

15

- METALLURGICAL ENGINEERGING
- MEDICAL EQUIPMENT & HOSPITAL PLANNING
- PETROLEUM, COAL & RELATED PRODUCTS
- PRODUCTION & GENERAL ENGINEERING
- SERVICE SECTOR
- TRANSPORT ENGINEERING
- TEXTILES
- WATER RESOURCES

SECTIONAL COMMITTEES

CED 02 : CEMENT & CONCRETE

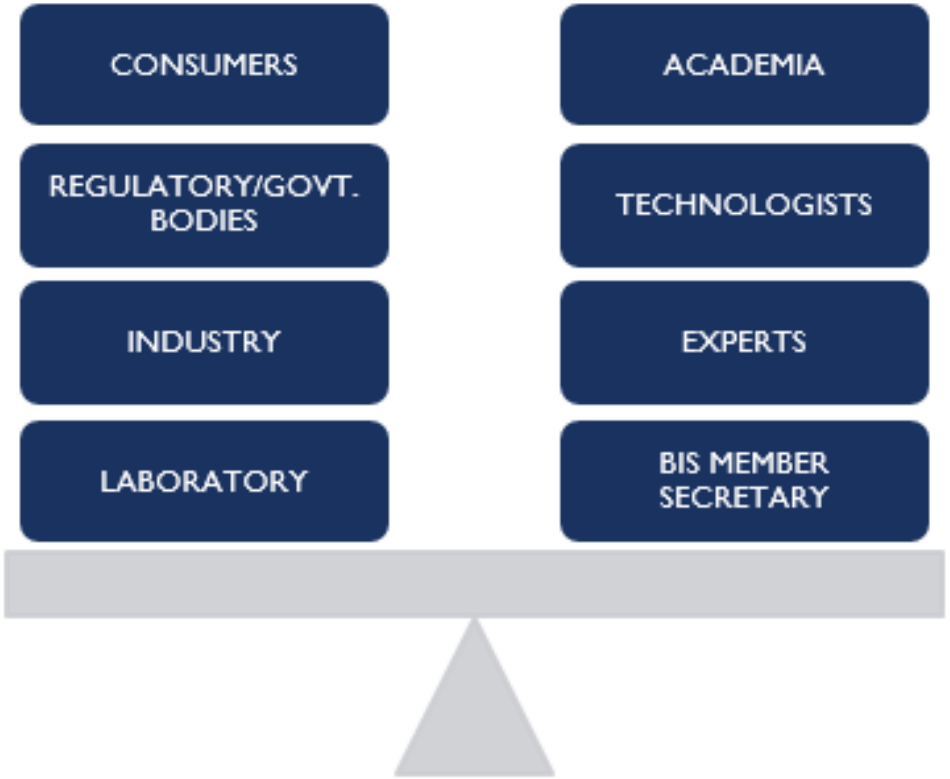
CHD 01 : INORGANIC CHEMICALS

MED 20 : PUMPS

TXD 08 : HANDLOOMS & KHADI

375 SECTIONAL COMMITTEES

SECTIONAL COMMITTEES (CONTINUED)



- About **one third** of the members represent industry.
- Composition is reviewed periodically. Sectional Committees are reconstituted once every three years.
- Co-option of additional members by the Sectional Committee based on request or on its own to maintain balance of stakeholders and to ensure involvement of domain area expertise.

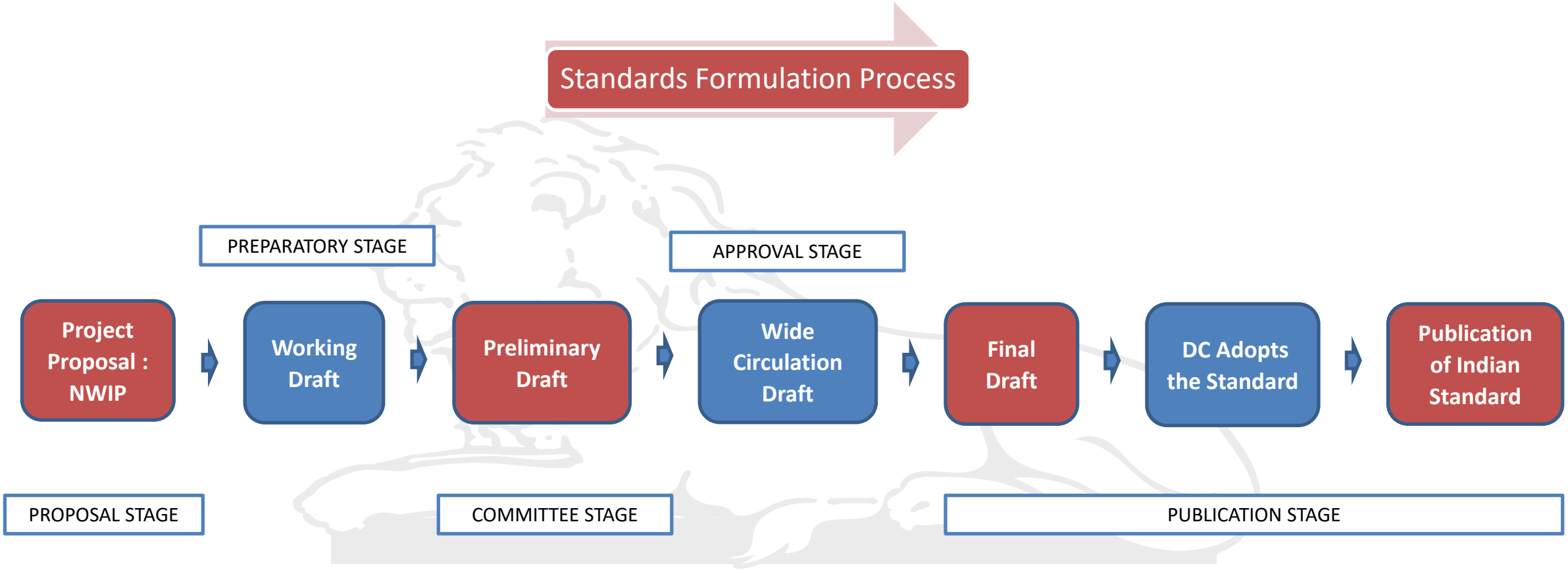
DIVISION COUNCILS – 15

SECTIONAL COMMITTEES – 375

SUB-COMMITTEES – 203

PANELS & WORKING GROUPS – 600+

The process – a PROJECT APPROACH



The process – a PROJECT APPROACH
Case Studies

- Cybersecurity [IEC 62443]
- Redundancy in power plant control systems
- Overloading capability of electric generators

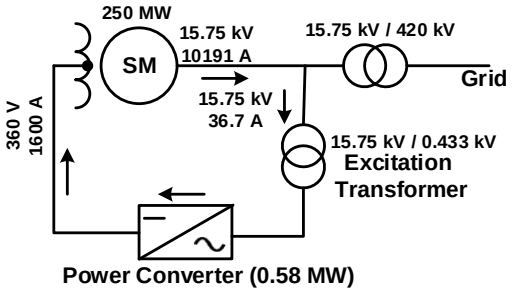


Fig. Fixed speed hydro unit

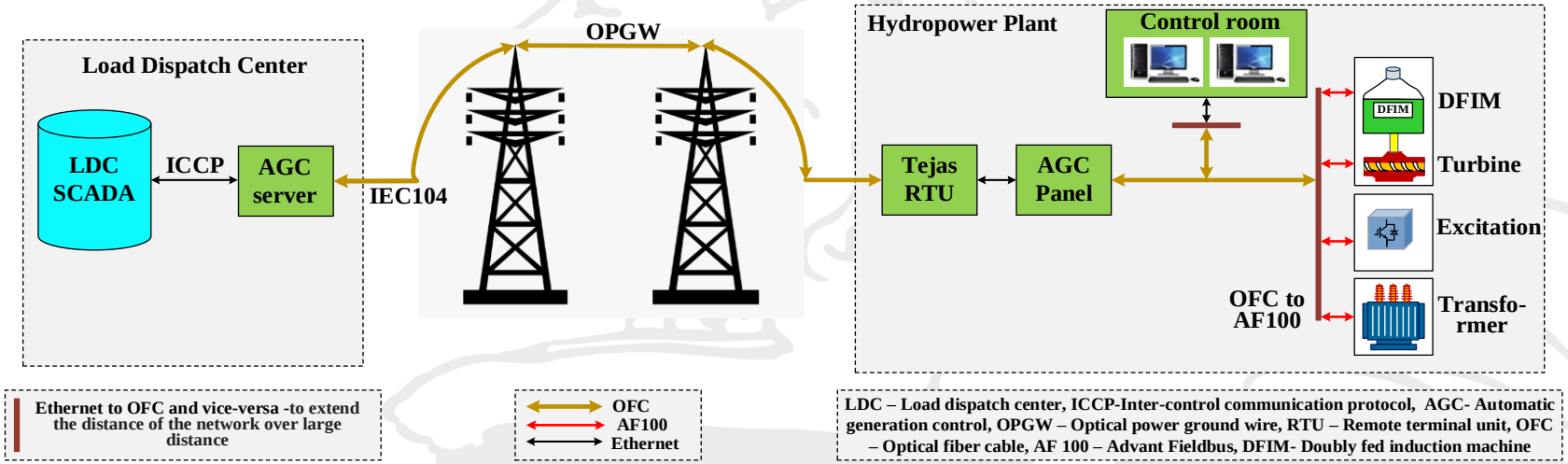
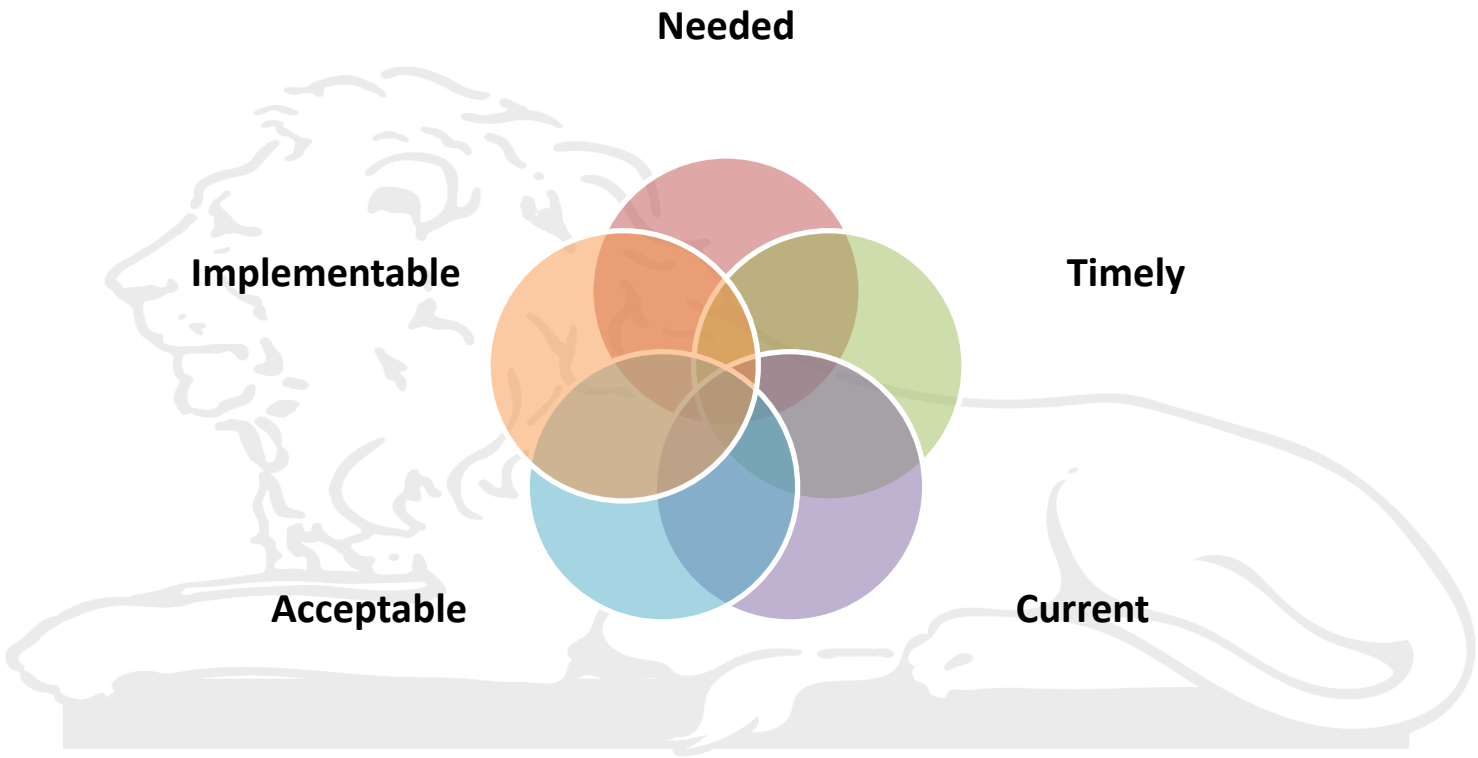


Fig. Communication link and protocols to exchange signals between LDC and hydropower plant

A standard must be…



References

[1] SO/IEC Guide 59, BIS Standards Formulation Manual- ISO and IEC recommended practices for standardization by national bodies.

[2] Bureau of Indian Standards (BIS) official website: https://www.bis.gov.in/

[3] https://standards.bsb.co.in/BISSubList.aspx

Acknowledgement:

- Bureau of Indian Standards (BIS)
- The Indian Institute of Technology Roorkee

Thank you for your attention