

Subject Code: TMI-103

Course Title: Tinkering and Mentoring

Topic : Bureau of Indian Standards

Standardization – THE ESSENCE OF CIVILAZATION*

by

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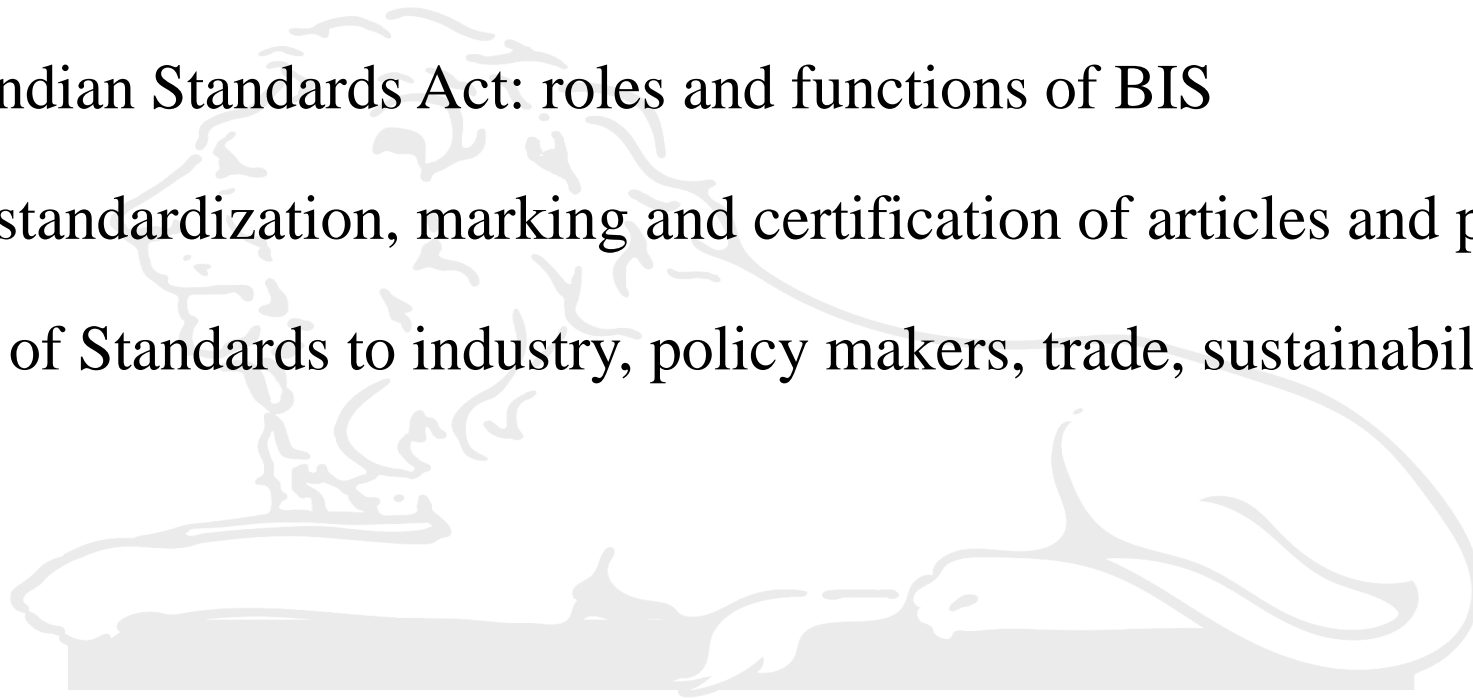
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* a part of the content of this presentation supplied by BIS



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

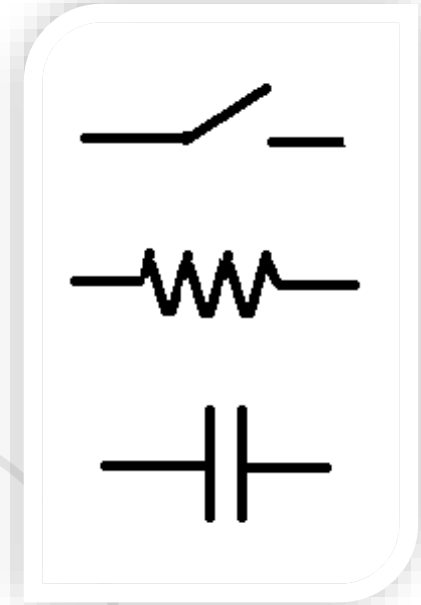


What do these represent?



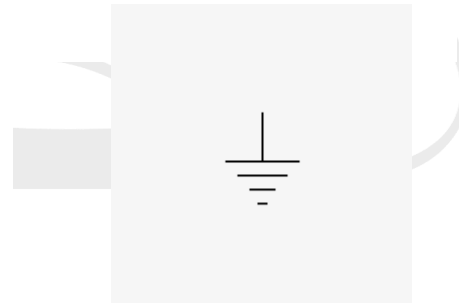
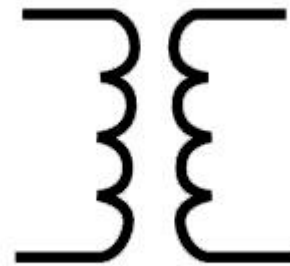
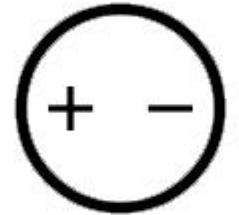
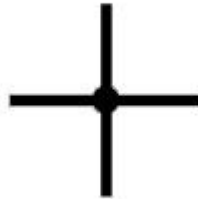
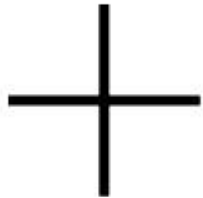
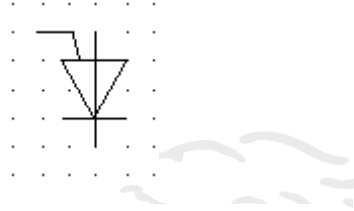
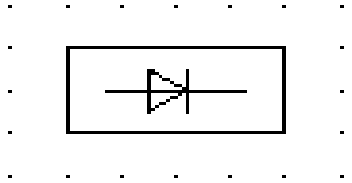
IEC 60417

ISO 7010



IEC 60617

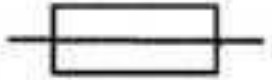
What do these represent?



LET'S TAKE A QUIZ



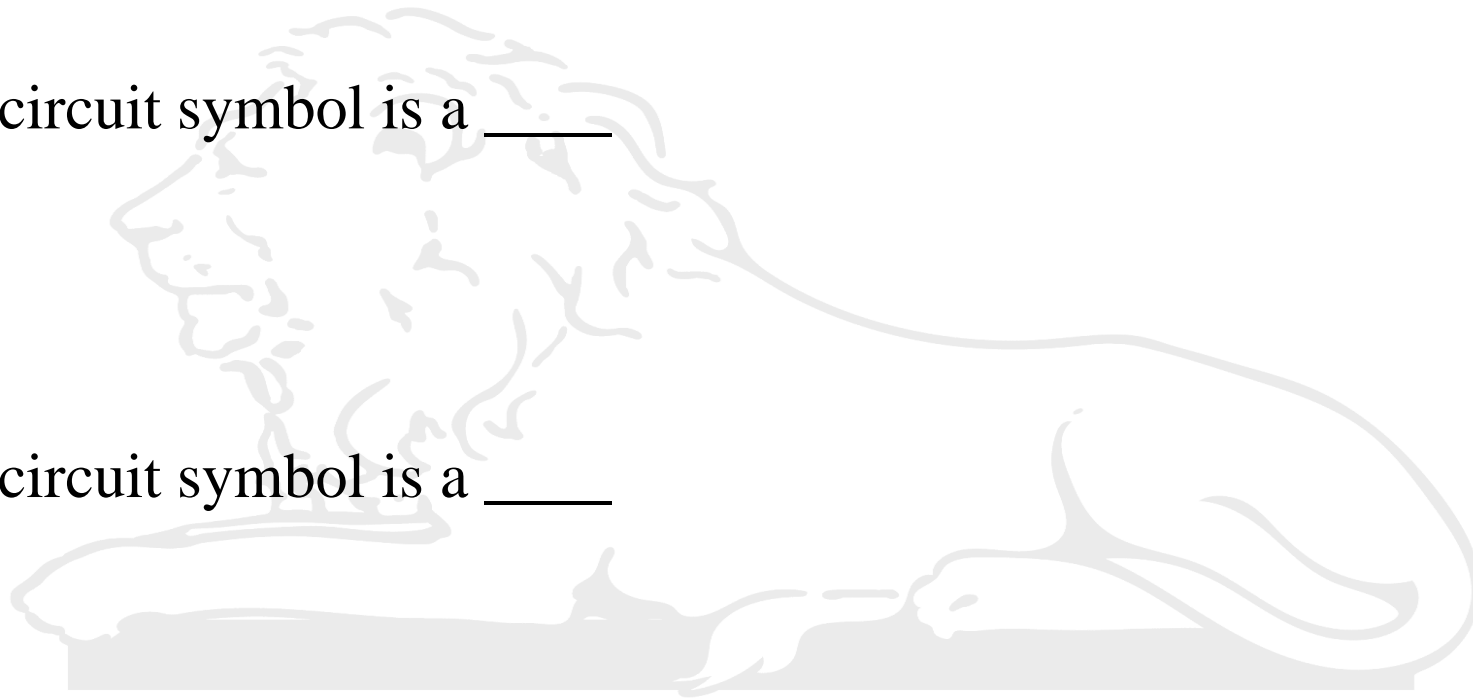
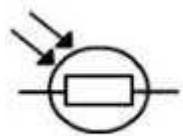
- The following circuit symbol is a _____



- The following circuit symbol is a _____



- The following circuit symbol is a _____



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...

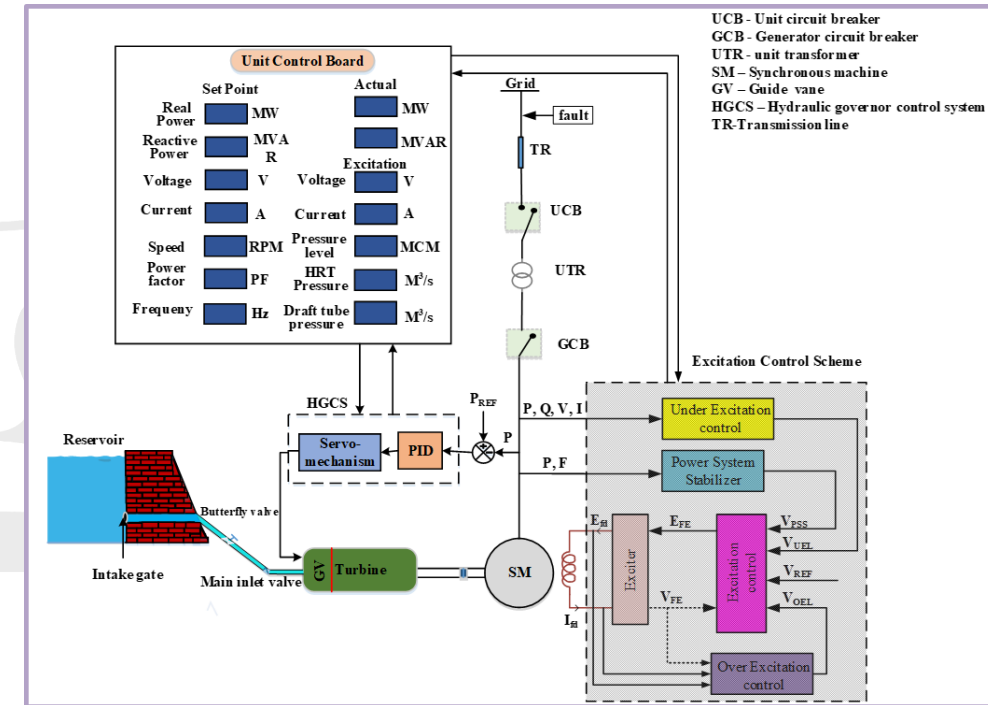


Fig. Hydraulic and excitation system of a single machine system

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



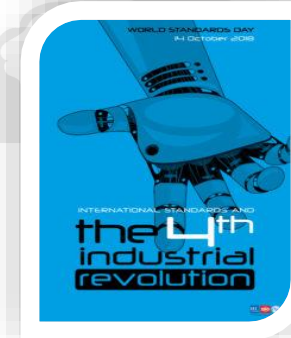
Miscommunication



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

Hospital standards

Medical laboratory

ISO 15189 Medical laboratory quality and competence
BS 70000 Medical physics quality safety and competence
ISO 13485 Medical device quality management systems
IEC 61223-3-5 Evaluation and routine testing of medical imaging departments

Pharmacy

ISO 11418 Containers for pharmaceutical preparations
ISO 17523 Requirements for electronic prescriptions
ISO 21549-7 Patient health card medication data

Inpatient/ Ward

PAS 1616 Provision of clinical services – specification
PAS 5748 Cleanliness services in hospitals
IEC 60601-2-52 Requirements for safety and performance of medical beds
BS 9997 Fire risk management systems

Imaging services

IEC 61223-3-5 Evaluation and routine testing of medical imaging departments
IEC 60601-2-28 Safety and performance of x-ray tube assemblies
IEC 62464-1 Medical resonance equipment for medical imaging

Executive/ Boardroom

ISO 22301 Business continuity
ISO 9001 Quality management
ISO 22316 Organizational resilience
ISO 26000 Social responsibility
ISO/IEC 27032 Guidelines to cybersecurity
PAS 1998 Whistleblowing arrangement
BS 13500 Delivering effective governance in organizations
ISO 31000 Risk management guidelines
ISO 10002 Complaints handling

Information governance

ISO/IEC 27001 Information security management systems
BS 10012 Data protection
BS 10008 Legal admissibility
ISO 30301 Management systems for records

Facilities management

EN 41001 Facilities management systems
ISO 45001 Occupational health and safety management
ISO 14001 Environmental management
ISO 22316 Organizational resilience
ISO 50001 Energy management
ISO 30414 Human capital reporting

Outpatient, rehabilitation, physiotherapy

PAS 150 Providing rehabilitation services
EN 60601-2-5 Requirements for ultrasonic physiotherapy equipment
ISO 9999 Assistive products for persons with disability

Surgery/ Operating theatre

ISO 13405-1 Classification and description of prosthetic components
ISO 5840 series Cardiovascular Implants
ISO 7153-1 Surgical instruments – materials
ISO 14408 Tracheal tubes designed for laser surgery

A&E

EN 13726 Test methods for primary wound dressings
EN 14885 Application of European standards for chemical disinfectants and antiseptics
ISO 11607 Packaging for terminally sterilized medical devices

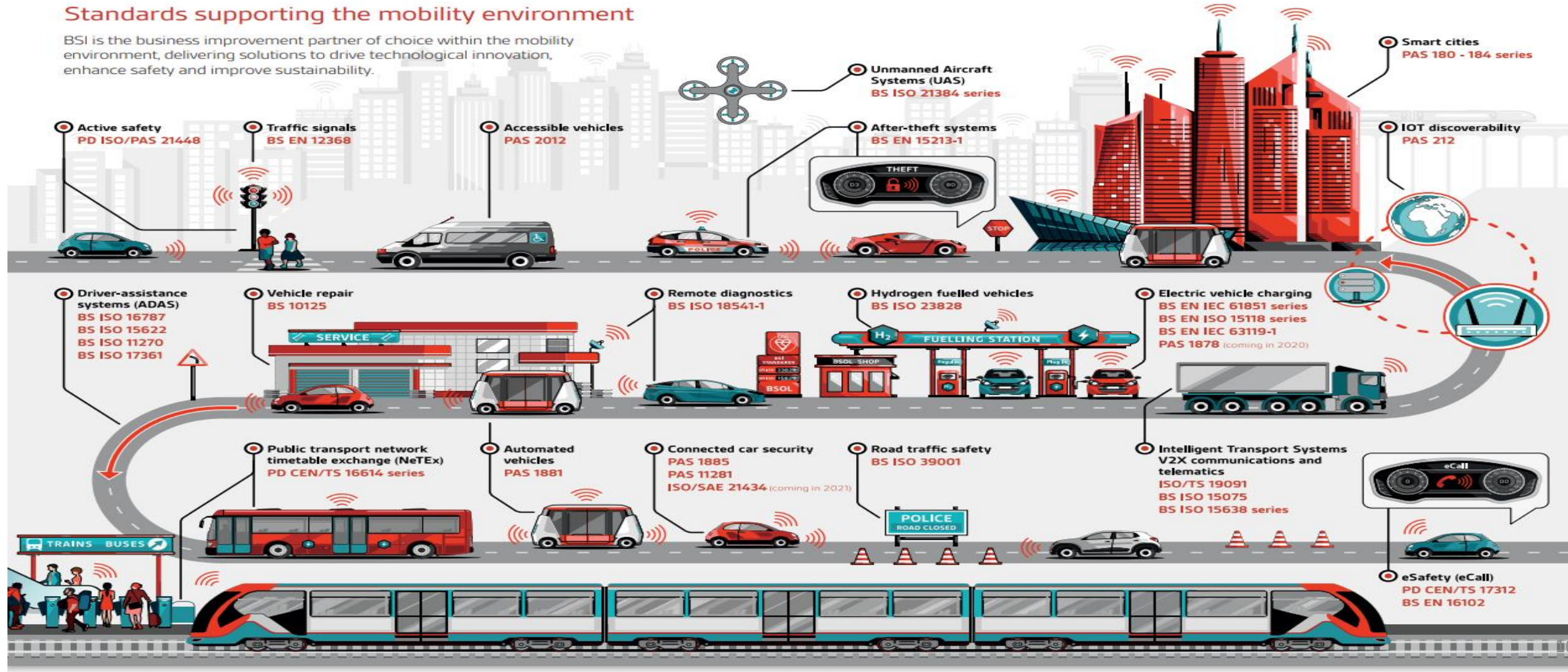
Maternity

EN 1282-2 Paediatric tracheostomy tubes
IEC 60601-2-21 Incubator heaters
IEC 60601-2-19 Basic safety and essential performance of infant incubators

Standards in our daily lives

Standards supporting the mobility environment

BSI is the business improvement partner of choice within the mobility environment, delivering solutions to drive technological innovation, enhance safety and improve sustainability.



Standards supporting mobility

Classroom We Sitting In



IS 14633:1999
Blackboards for class rooms - Specification

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

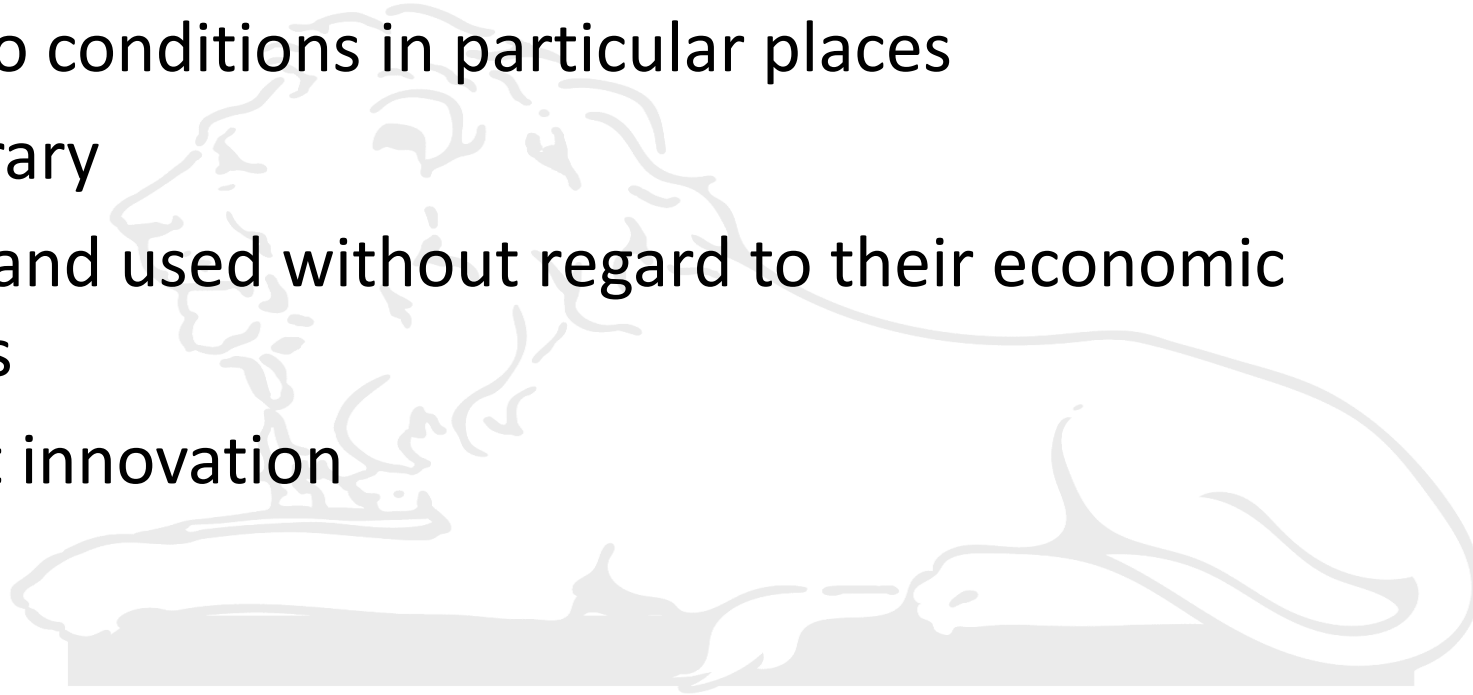


5

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

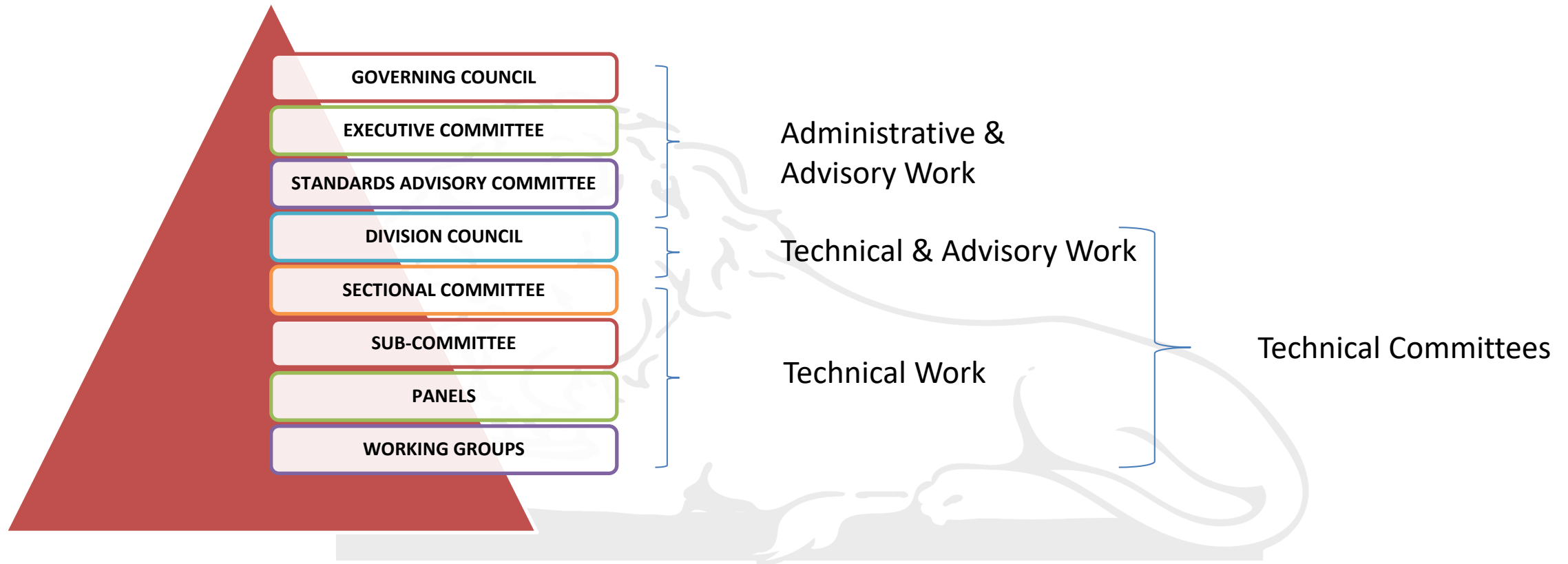
- Avoiding duplication, overlap and contradictions.
- Coordination between Standards Development Organizations: Harmonious Standards Development

6. Development Dimension

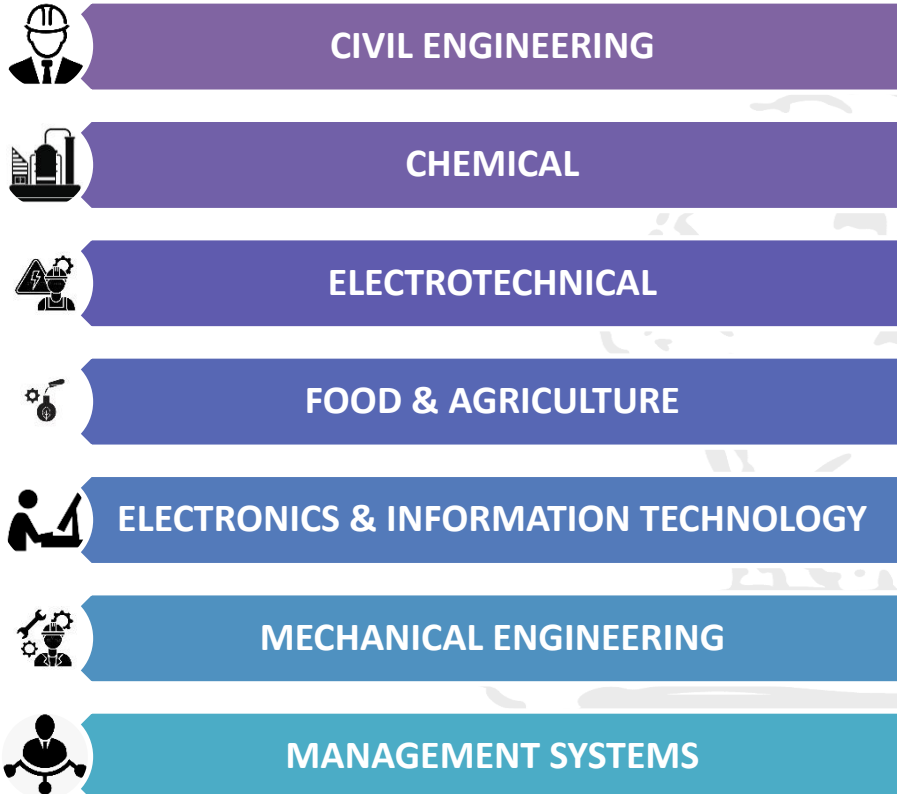
- Engaging potentially underrepresented interested parties.
- Improving accessibility of information.

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

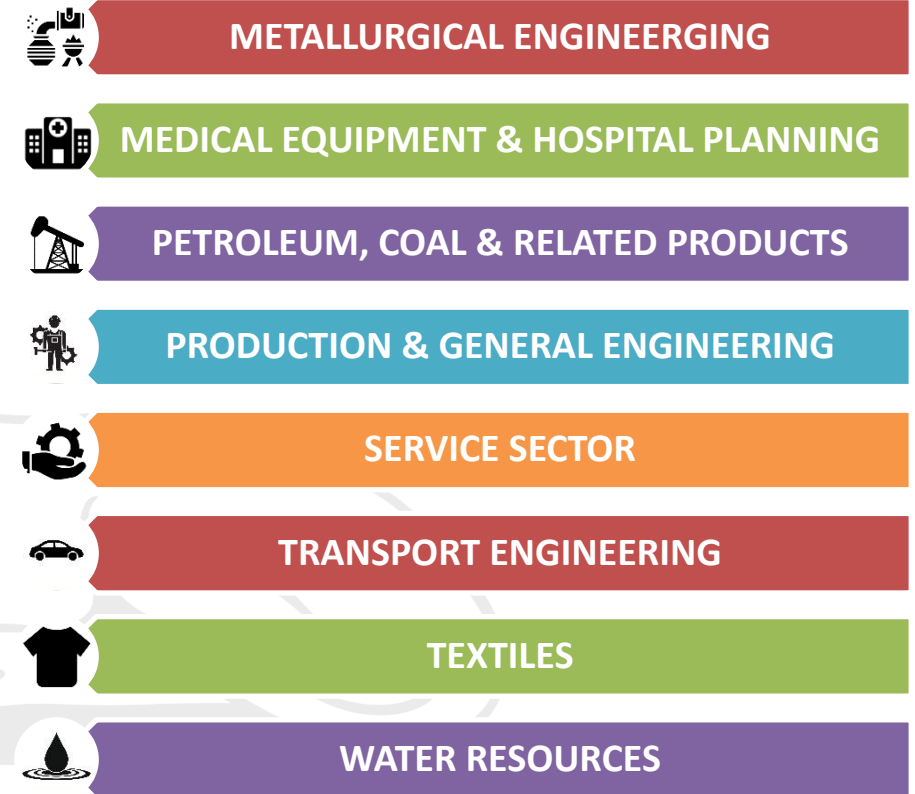
BIS Structure



DIVISION COUNCILS



15



SECTIONAL COMMITTEES

**CED 02 :
CEMENT &
CONCRETE**

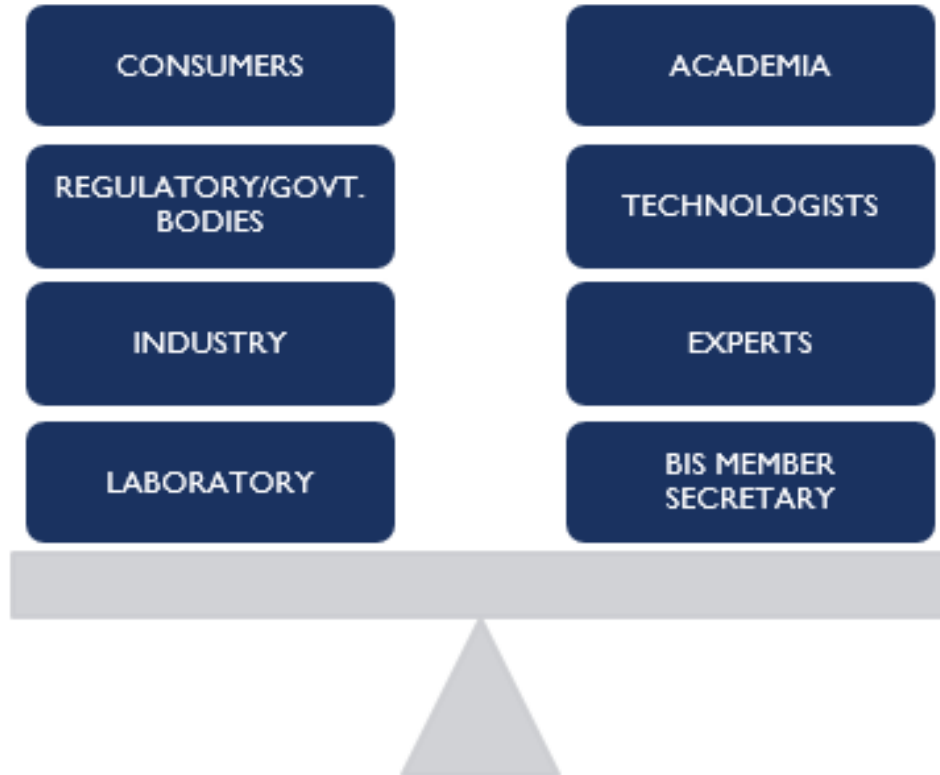
**CHD 01 :
INORGANIC
CHEMICALS**

**MED 20 :
PUMPS**

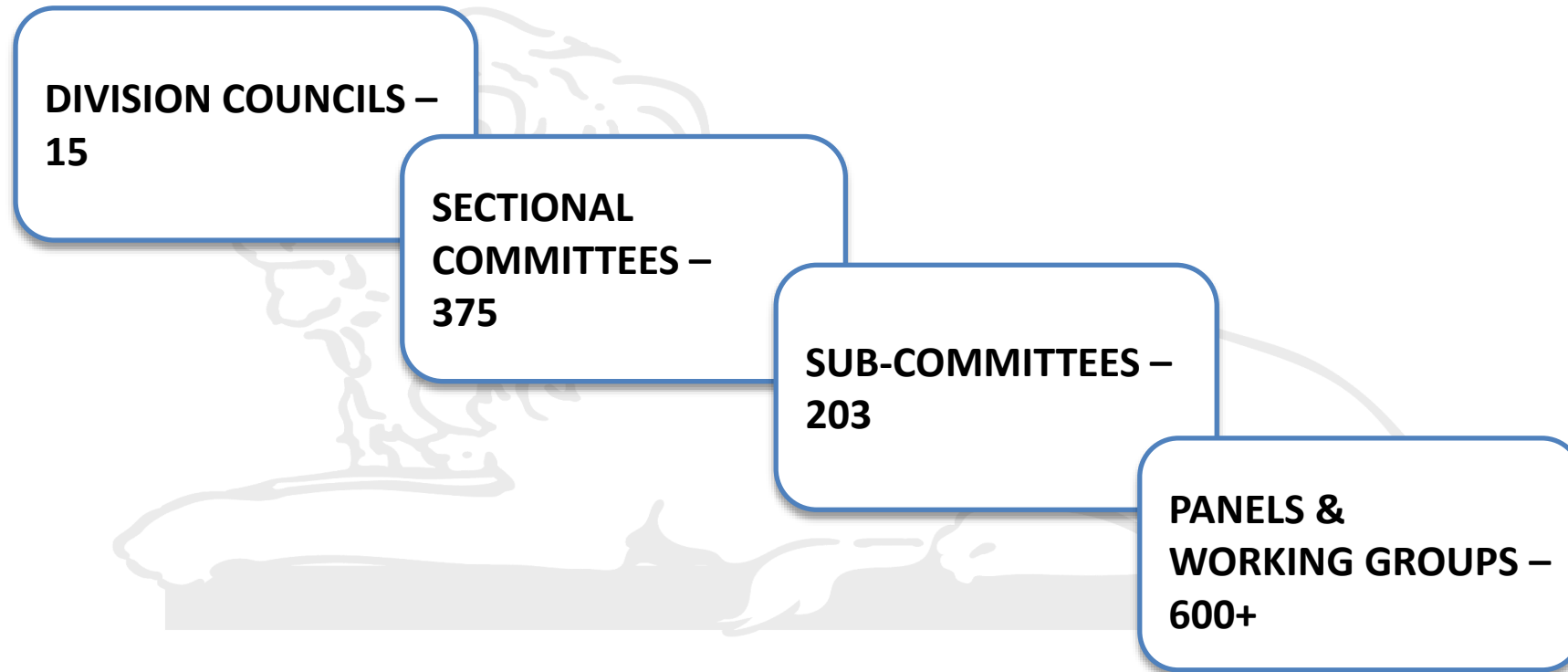
**TXD 08 :
HANDLOOMS
& KHADI**

**375 SECTIONAL
COMMITTEES**

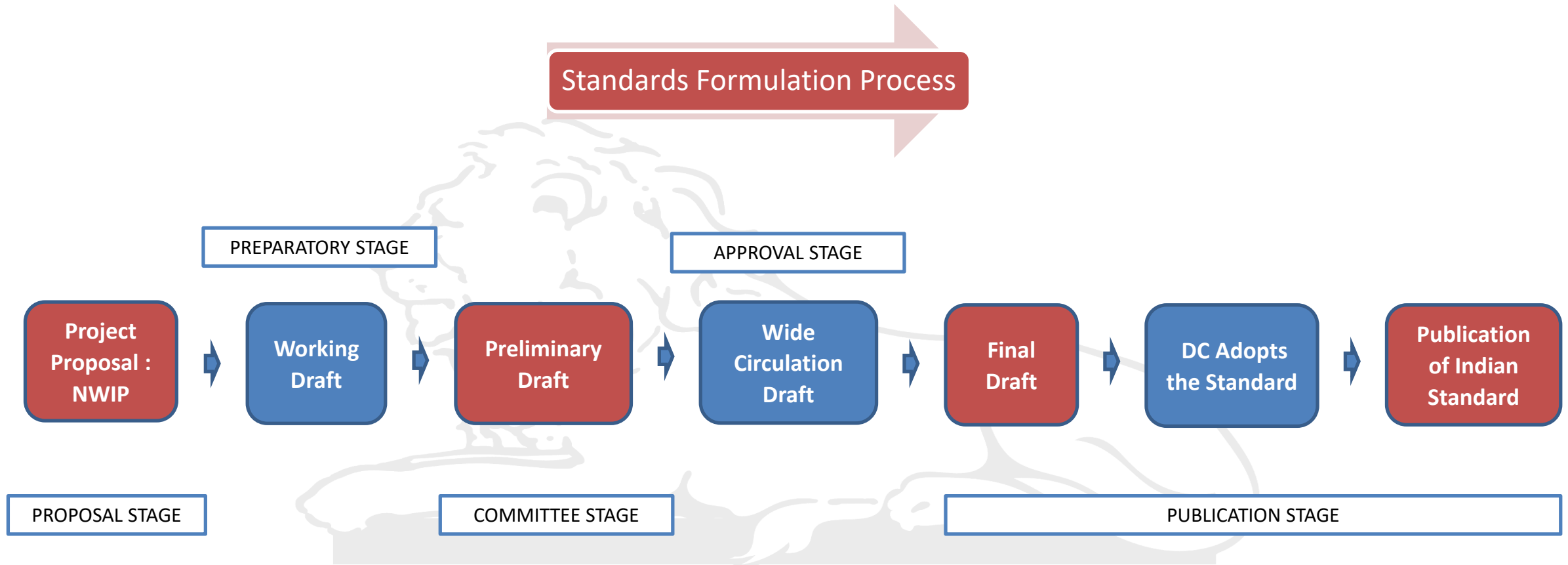
SECTIONAL COMMITTEES (CONTINUED)



- 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.



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

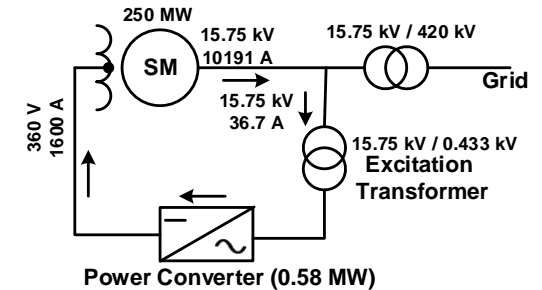


Fig. Fixed speed hydro unit

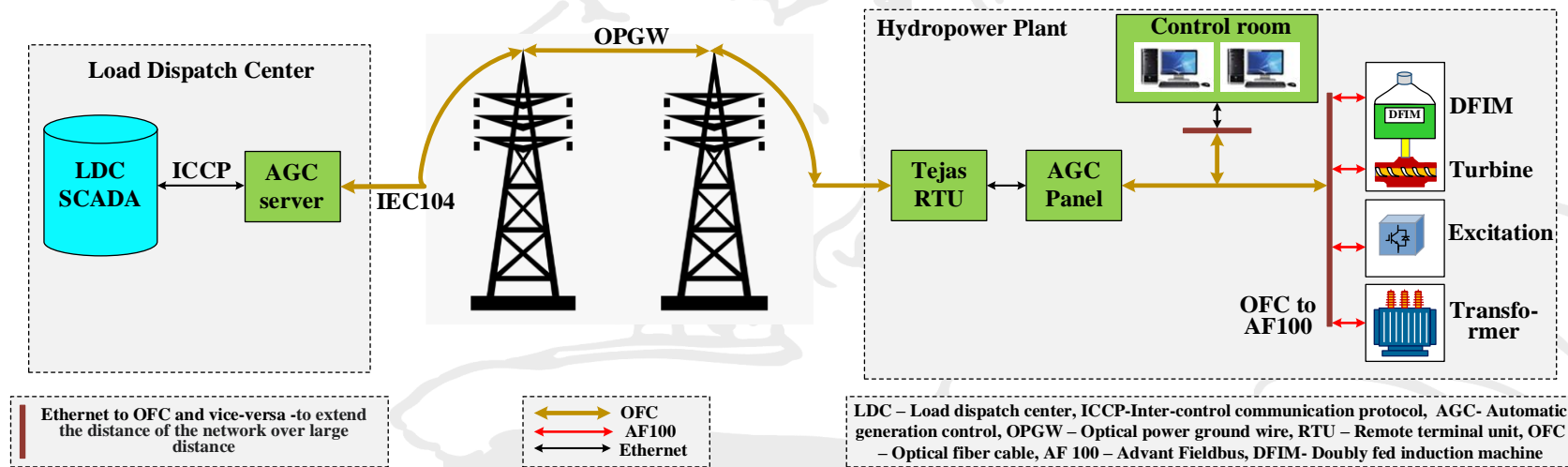
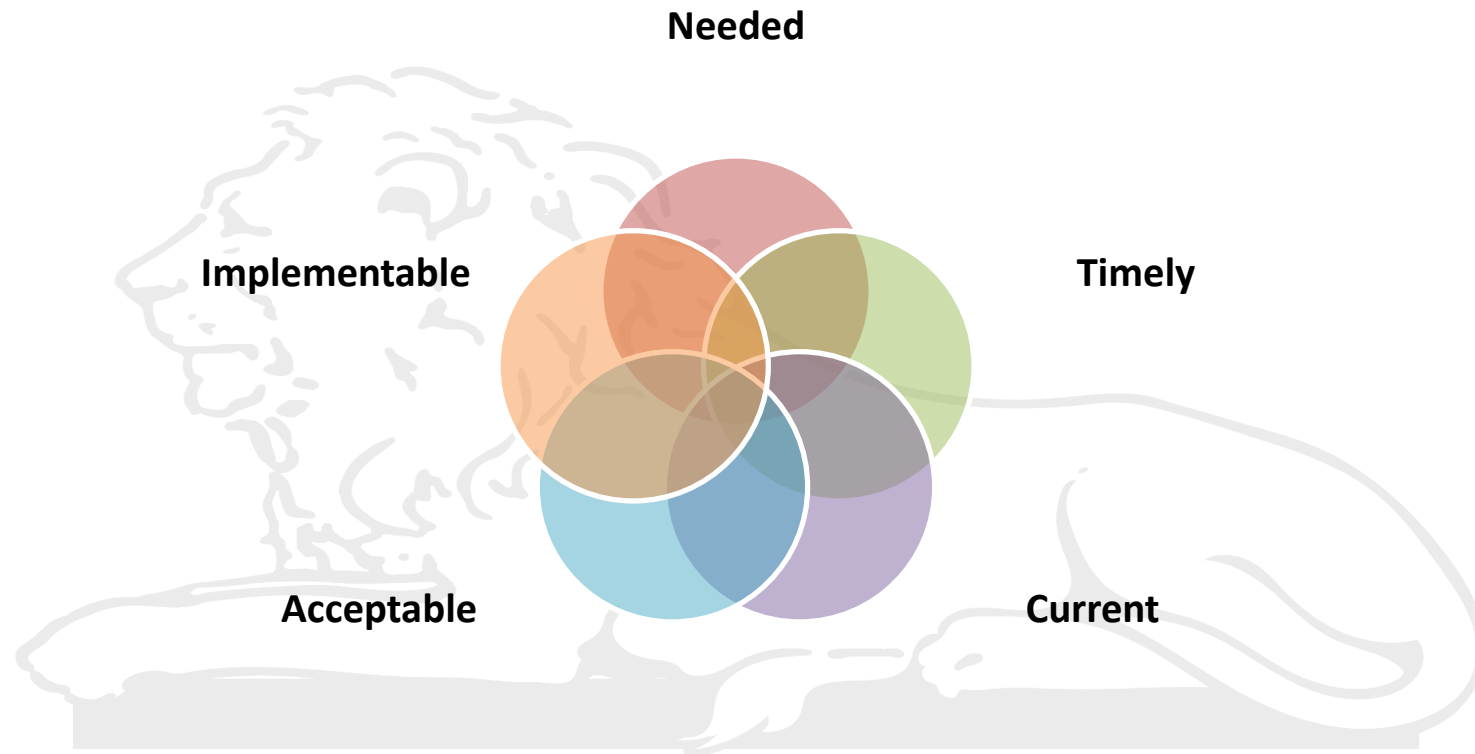


Fig. Communication link and protocols to exchange signals between LDC and hydropower plant

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

