Role of BIS as National Standards Body of India & Importance of Standards in Power System Interconnection

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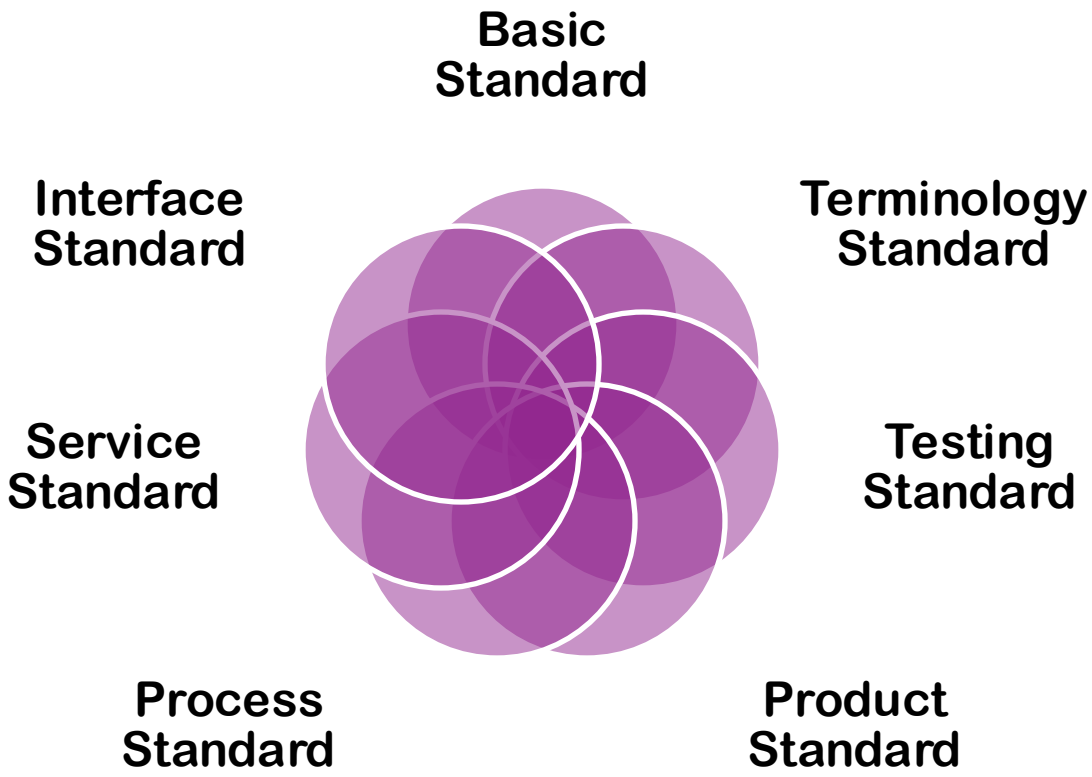
Contents

Standards

What is a standard?

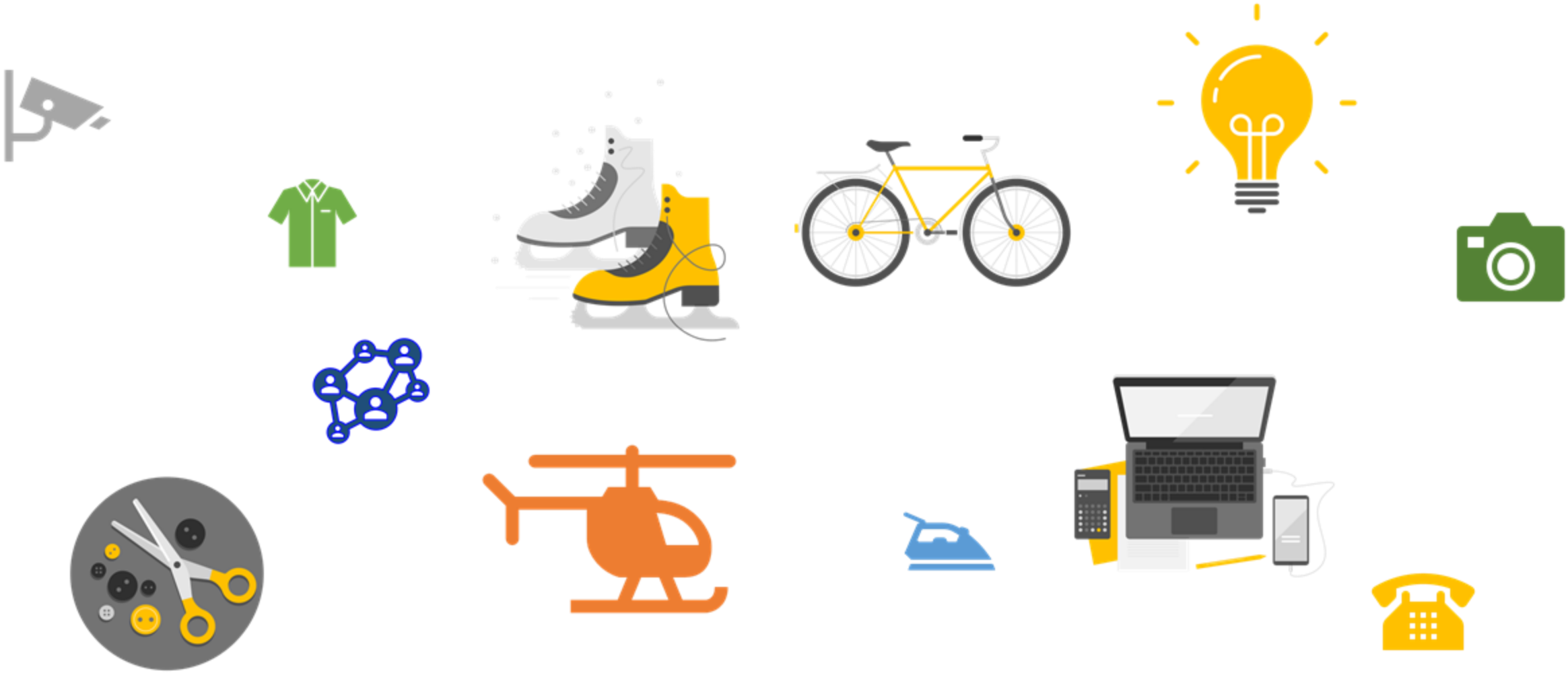
- A Standard is a document, established by consensus and approved by a recognized body, that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context.
- Standards should be based on the consolidated results of science, technology and experience, and aimed at the promotion of optimum community benefits (ISO Guide 2).
- The rules or agreed way of doing 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

TYPES OF STANDARDS



(ISO GUIDE 2)

Standards are everywhere

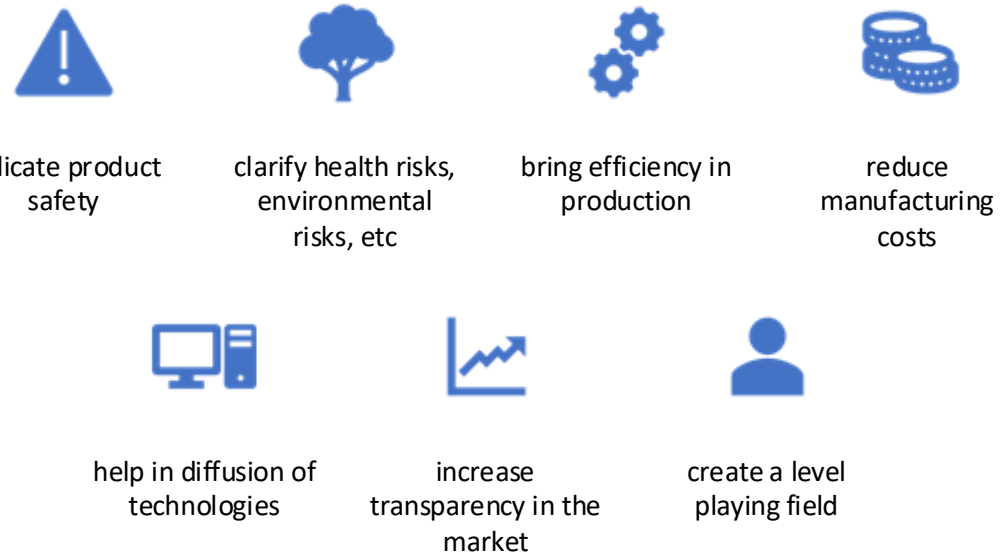


Standards go unnoticed

- Standards usually go unnoticed
- Importance felt when any problem arises
- Lack of standards can have severe consequences - from mere frustration to loss of life & property

Why are standards important?

Standards contain information that:



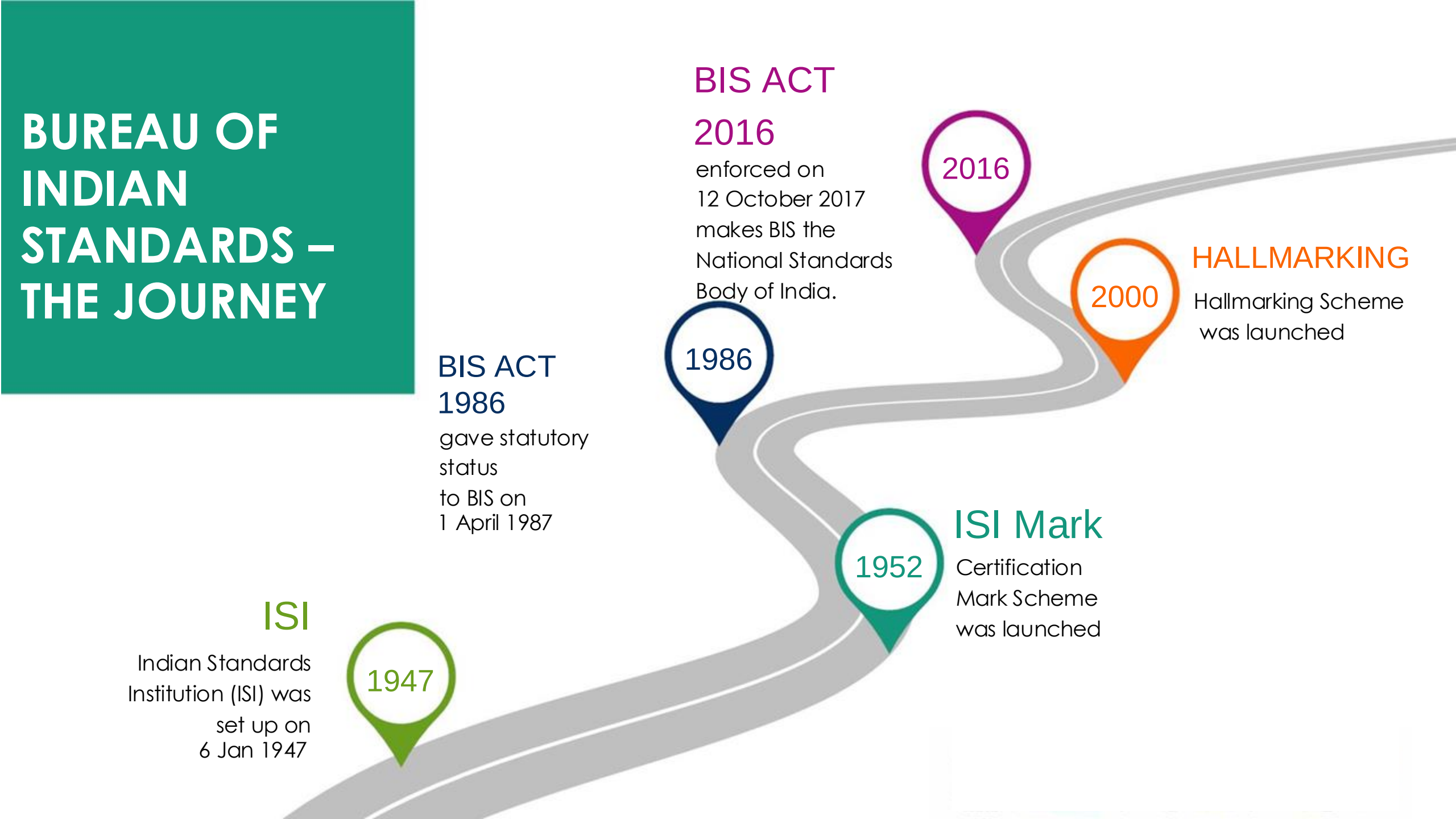
Standards contribute to:

- Variety control
- Compatibility
- Interchangeability
- Health
- Safety
- Protection of the environment
- Distribution of technical information
- Trade
- Consumer protection

Bureau of Indian Standards (BIS)

"National Standards Body of India"

BUREAU OF INDIAN STANDARDS – THE JOURNEY

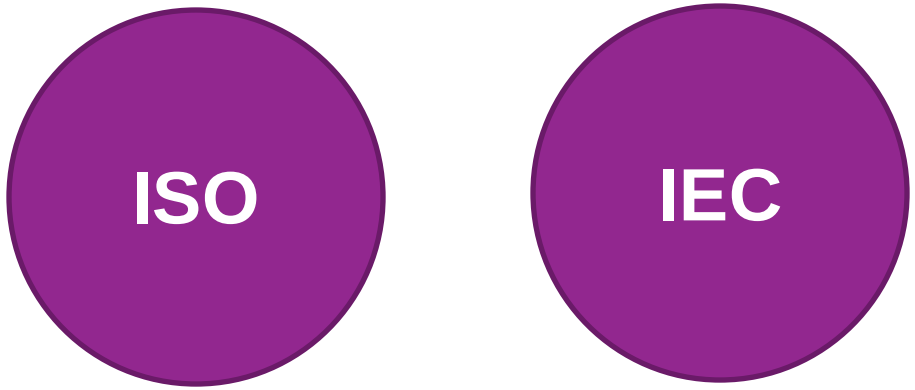


BIS – Core activities

- **Standards Formulation**
- Conformity Assessment
  - Product certification
  - Self declaration of conformity
  - Hallmarking
  - System Certification
- Testing
- Training

International standardization

- Harmonization with the international standards



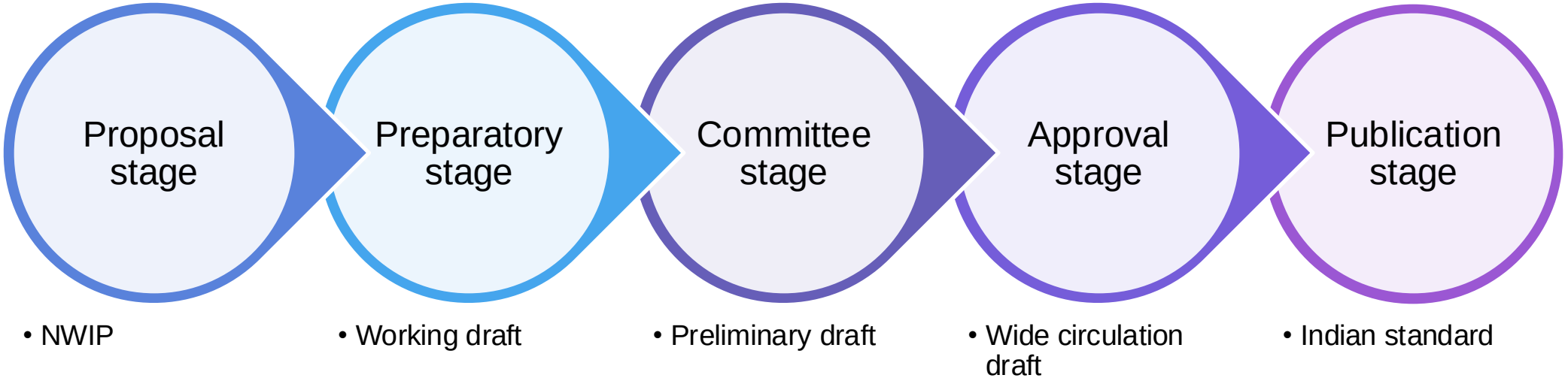
Technical Divisions in BIS

1. Civil Engineering (CED)
2. Chemical (CHD)
3. **Electro-technical (ETD)**
4. Food and Agriculture (FAD)
5. Electronics and IT (LITD)
6. Mechanical Engineering (MED)
7. Medical Equipment & Hospital Planning (MHD)
8. Management and Systems (MSD)
9. Metallurgical Engineering (MTD)
10. Petroleum, Coal & Related Products (PCD)
11. Production and General Engineering (PGD)
12. Transport Engineering (TED)
13. Textile (TXD)
14. Water Resources (WRD)
15. Service Sector (SSD)

Stakeholders

- Government
- Regulators
- Industry
- Laboratories
- Research & Developments
- Consumers
- **Academia**

How standards are published?



Challenges with Grid Integration

- Variability and Intermittency

  Solution: Energy storage systems (ESS)

- Transmission and storage of renewable energy

  Solution: Grid modernization efforts, including the development of smart grids and improved transmission infrastructure

- Maintaining system reliability and stability

  Solution: Advanced grid management technologies, such as real-time monitoring and control systems

- Regulatory challenges

  Solution: Supportive policy frameworks and streamlining & regulatory Processes

Importance of Standards in Power System Interconnection

- **Ensuring Grid Reliability & Stability** – Standards define technical requirements to maintain a stable and reliable power system amid increasing interconnections.
- **Facilitating Renewable Energy Integration** – Provides guidelines for the smooth integration of solar, wind, and other DERs without compromising grid stability.
- **Future-Proofing the Grid** – Adapts to evolving challenges such as increased electrification, and cybersecurity threats.
- **Enhancing Power Quality-** Defines limits for harmonics, voltage microgrids fluctuations, and frequency deviations to ensure consistent power supply.

Standardization in the area of Grid Integration

- ETD 46- Grid Integration of Renewables
- Scope: To prepare standards in the field of Grid Integration comprising of LT (ON Grid, Off Grid and Hybrid with and without storage), HT and EHT for all capacities.

Important Standards Published

- **IS 18968: 2025** 'Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces'
- Modified adoption of IEEE 1547:2018 with a **National Annexure tailored to Indian conditions, including adaptation to the 50 Hz grid frequency.**
- Uniform standard for the interconnection and interoperability of DERs with EPSs. It provides requirements relevant to the interconnection and interoperability performance, operation and testing, and, to safety, maintenance and security considerations.

- **IS 18969 : 2025** Conformance Test Procedures for Equipment Interconnecting Distributed Energy Resources with Electric Power Systems and Associated Interfaces
- Modified adoption of IEEE 1547.1:2020 with a **National Annexure tailored to Indian conditions, including adaptation to the 50 Hz grid frequency.**
- tests and procedures for verifying conformance of distributed energy resources (DERs) to IS 18968: 2025.

- **IS 18970 : 2025** Guide for Conducting Distribution Impact Studies for Distributed Resource Interconnection
- Adoption of IEEE 1547.7: 2013
- Provides and describes the criteria, scope, and methodology for determining which engineering studies need to be performed to assess the potential impact of DR interconnected to an Area EPS distribution system.
- Provides descriptions of study types and tools, methodologies in using them for evaluation, and the knowledge that will be gained from performing them.

Grid Integration Standards: What's Next?

- Grid integration of renewable energy generation - Terms and definitions
- Renewable energy power forecasting technology
- Grid code compliance assessment methods for grid connection of wind and PV power plants
- Interconnection and Interoperability of Inverter Based Resources (IBRs) Interconnecting with Associated Transmission Electric Power Systems' (IEEE 2800)
- Grid connected solar rooftop PV

Standardization in the field of grid integrated Electrical Energy

Indian Standards Published by Electrical Energy Storage System ETD 52

- IS 17067 (Part 1) Electrical Energy Storage Systems- Vocabulary
- IS 17067 (Part 2/Sec 1) Unit Parameters and Testing Methods
- IS 17067 (Part 4 / Sec 1) Guidance on Environmental Issues
- IS 17067 (Part 4 / Sec 1) Safety requirements electrochemical based EESS
- IS 17092 Electrical Energy Storage Systems- Safety Requirements
- IS 17387 General Safety and Performance Requirements of BMS

Standardization in the field of Smart Grid

ETD13 : Equipment For Electrical Energy Measurement And Load Control

&

LITD 10 : Power System Control And Associated Communications

IS 16444 Series a.c. Static Direct Connected Watthour Smart Meter Class 1 and 2

IS/IEC 61970-1 series Energy management system application program interface (EMS - API)

IS/IEC/TS 62351 Series Power systems management and associated information exchange - Data and communications: Security

IS/IEC/TR 61850 Series Communication networks and systems for power utility automation

THANK YOU