NIST

Standards Coordination Office

Fundamentals of Standards

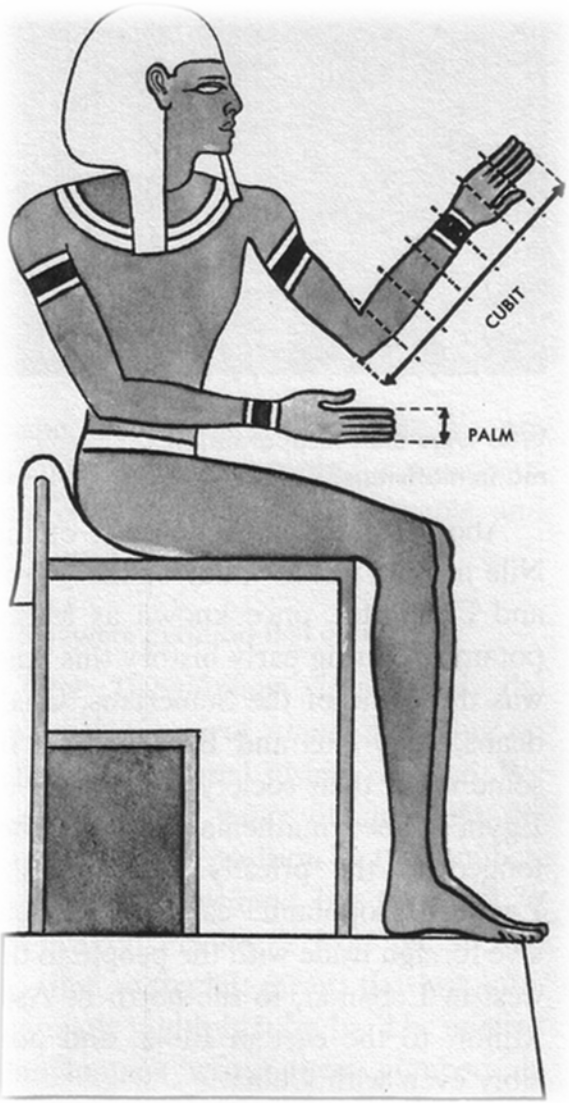
June 2015

Today’s Discussion

- Standards History
- Standards Terminology
- Standards Development
- U.S. Standardization System
- International Standards

Standards History: Standards all around us

Standards History: 3000 BC



Standards History: 1790 BC

Code of Hammurabi

- An eye for an eye, a tooth for a tooth.

- Early Building Codes:
  - The builder is responsible for the stability of the house built by him; if it falls down and kills the master of the house, the builder is killed; if it kills a child of the house, a child of the builder is killed.
  - If a shipbuilder build a boat for some one, and do not make it tight, if during that same year that boat is sent away and suffers injury, the shipbuilder shall take the boat apart and put it together tight at his own expense. The tight boat he shall give to the boat owner.

Standards History: Baltimore Fire of 1904

DESERET EVENING NEWS.

10 PAGES—LAST EDITION — MONDAY, FEBRUARY 8, 1904, SALT LAKE CITY, UTAH. — FIFTY-FOURTH YEAR.

Baltimore's Great Fire Is The Worst Known To History

FURY OF FLAMES IS NOW CHECKED.

Loss Will Reach Three Hundred Millions

JAPAN WARSHIPS BEGIN OPERATIONS.

VETERANS OF UTAH'S INDIAN WARS.

RA THE SUN

BALTIMORE MONDAY MORNING, FEBRUARY 8, 1904.

TWENTY-FOUR BLOCKS BURNED IN HEART OF BALTIMORE

CITY'S MOST VALUABLE BUILDINGS IN RUINS

LOSS VARIOUSLY ESTIMATED AT FROM $50,000,000 TO $80,000,000

BLAZE STILL SPREADING EASTWARD AND SOUTHWARD AT 3.30 A. M.

Starting In John E. Hurst Building The Fire Sweeps South To Lombard, East To Holliday And North To Lexington, Destroying Wholesale Business Houses, Banks, Continental, Equitable, Calvert, B. And O. Central, The Sun And Other Large Buildings.

Standards Terminology: Key Terms

STANDARD

Technical specification for a product, service, person, process or system with which *compliance is voluntary.*

TECHNICAL REGULATION

Technical specification for a product, service, person, process or system with which *compliance is mandatory.*

CONFORMITY ASSESSMENT

Processes used to verify the compliance of a product, service, person, process or system to either a standard or a regulation (e.g., testing, certification, inspection)

Standards Terminology: Standard

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. *(ISO/IEC Guide 2:1994)*

Document, approved by a recognized body, that provides for common and repeated use, rules, guidelines or characteristics for products or related processes and production methods, with which compliance is not mandatory. It may also include or deal exclusively with terminology, symbols, packaging, marking or labelling requirements as they apply to a product, process or production method. *(WTO TBT Agreement of 1995)*

Standards Terminology: Standard (continued)

Common and repeated use of rules, conditions, guidelines or characteristics for products or related processes and production methods, and related management systems practices. *(NTTAA of 1995 & OMB Circular A-119 of 1998)*

Standards Terminology: Other terms

- Recommendation
- Best practice
- Guide
- Guideline
- Guidance
- Specification
- De facto standard
- Code

Standards Terminology: Codes

- Used in the design, build and compliance process to construct safe, sustainable, affordable and resilient structures.
- Prevents disaster occurrence and manages disaster impact - minimizes the risk and effects.
- Examples:

Standards Terminology: Voluntary Standard

- Voluntary because …
  - developed by private sector, for market needs
  - not legally binding
  - created by participants who freely contribute and participate, usually for business reasons
- No longer voluntary when …
  - incorporated by reference (IBR) in a regulation
- Not really voluntary when…
  - well recognized in the market and not abiding by it would have negative impacts

Standards Terminology: Performance and Design Standards

- Performance standard - requirements expressed in terms of required results without stating the method of achieving the functional or operational results
  - *Example: Maximum load capacity*
- Design (or descriptive) standard - requirements expressed in terms of specific design requirements such as materials, construction, and dimensions
  - *Example: Maximum weight*
- Performance standards are usually preferred to design standards to accommodate innovation.

Standards Terminology: Key Concepts

Openness

Transparency

Balance

Due Process

Consensus

Standards Terminology:

General agreement, but not necessarily unanimity, and includes a process for attempting to resolve objections by interested parties, as long as all comments have been fairly considered, each objector is advised of the disposition of his or her objection(s) and the reasons why, and the consensus body members are given an opportunity to change their votes after reviewing the comments. (*OMB Circular A-119 of 1998*)

Standards Terminology: Consensus (continued)

- You know it when you see it
- Participants should agree that consensus has been reached
- Consensus is not the same as balloting
- Consensus is a process and it needs to be achieved in committee at every stage of the process

Standards Development: Process

Committee works

Stakeholders propose concept & usually begin with a draft

Balloting & comments

Final approval & publication

U.S. Standardization System: How it works

The U.S. standards system is voluntary, decentralized, sector and market driven and is, sometimes, competitive and duplicative.

The system relies on cooperation and communication among:

- Industry
- Private sector standards organizations
- Stakeholders
- Government

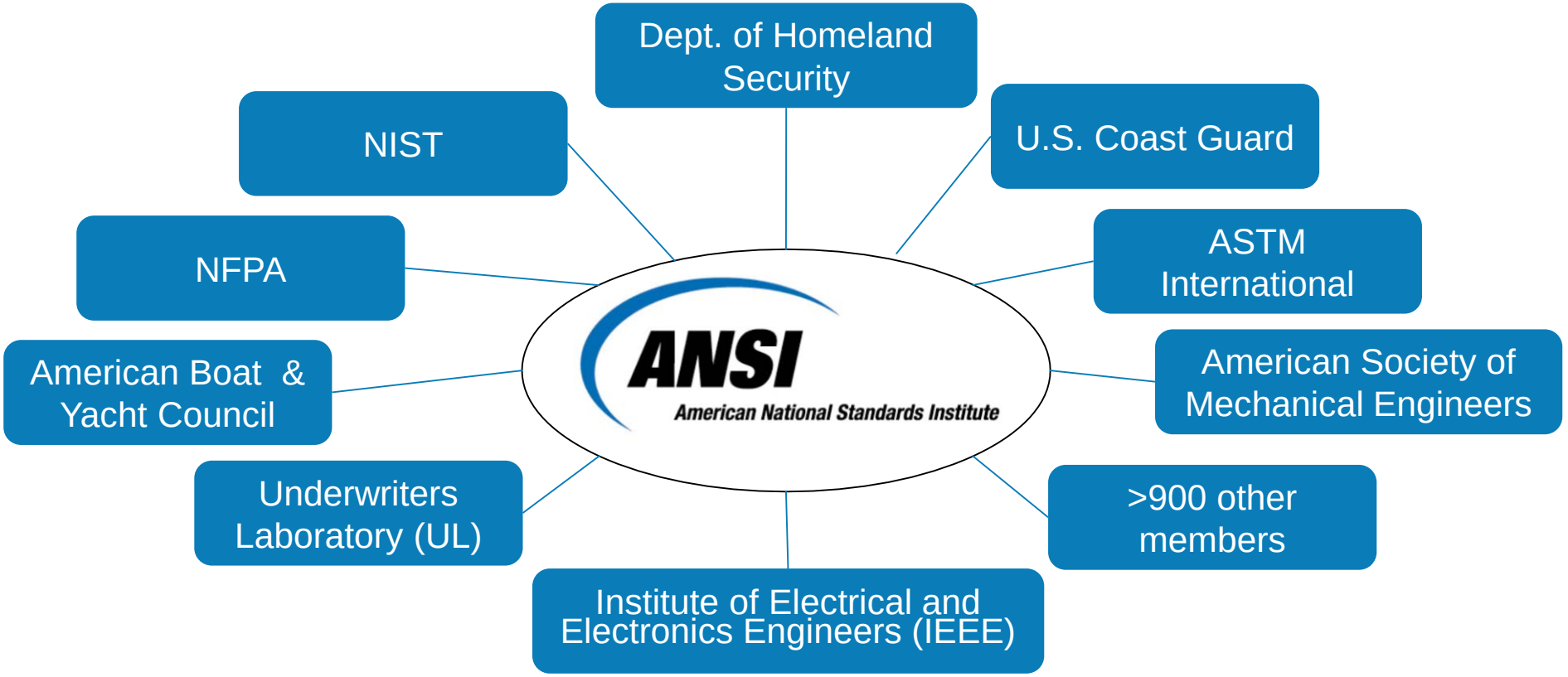
U.S. Standardization System: "One Approach Among Many in the World"

The U.S. "standardization" model:

- resembles the nation's economic structure: sector-based and driven by market needs
- reflects U.S. culture and traditions
- reflects government/private sector dynamics
- suits the size of the country and the complexity of the U.S. economy
- relies strongly on diversity and decentralization

U.S. Standardization System: Key Players

U.S. Standardization System: ANSI



- Administrator of the U.S. private-sector, voluntary standardization system.
- Membership organization: U.S. businesses, professional societies, trade associations, SDOs, government agencies, institutes, and consumer and labor interests.

U.S. Standardization System: ANSI (continued)

- Founded in 1918 by 5 professional/ technical societies and 3 federal government agencies
- Coordinates the U.S. standards system
- Does not write standards
- Accredits ~230 standards developing organizations
- Represents the U.S. in the ISO and IEC *(more to come)*

1. American Institute of Electrical Engineers
2. American Society of Mechanical Engineers
3. American Society of Civil Engineers
4. American Institute of Mining and Metallurgical Engineers
5. American Society for Testing and Materials
6. U.S. Department of War
7. U.S. Department of Navy
8. U.S. Department of Commerce

ANSI
American National Standards Institute

U.S. Standardization System: NIST

- Is a key contributor and leader in the development and implementation of U.S. standards policy
- Approximately 1/3 of technical staff participates in standards development activities including committees, round robins, etc.

U.S. Standardization System: SDOs

- Professional societies whose members seek to advance their professions and also develop standards
- Trade associations promote their industry's products, and also develop standards
- Testing and certification organizations produce their own standards and may also use those of other organizations
- Organizations that only develop standards

U.S. Standardization System: Consortia

Consortia: groups of companies or individuals that come together to create a standard to address a (typically single) commercial need.

Characteristics:

- Quick standards setting
- Began in 1980s to meet changing technological needs
- Most often joint ventures that are “pay to play”
- Recently, many consortia in the food industry and in the environmental/sustainability sectors
- Enormous variation among consortia in terms of openness, transparency and consensus

U.S. Standardization System: Committee Members

- Unpaid volunteers
- Industry, subject matter experts, end users, and other stakeholders
- Create standards by providing their knowledge, expertise, end user experience, or other technical input
- Heart and soul of standards

International Standards: What is an International Standard?

The World Trade Organization (WTO) Technical Barriers to Trade (TBT) Agreement states:

*Where technical regulations are required and **relevant international standards** exist or their completion is imminent**, Members shall use them**, or the relevant parts of them, as a basis for their technical regulations **except** when such international standards or relevant parts would be an ineffective or inappropriate means for the fulfilment of the legitimate objectives pursued, for instance because of fundamental climatic or geographical factors or fundamental technological problems.*

The WTO TBT Agreement

- Multilateral governmental agreement; all WTO members are bound by the Agreement
- Recognizes the right of countries to regulate at the level they consider appropriate
- Defines the legitimate objectives of technical regulations
- Aims to facilitate trade
- Focuses on technical regulations and related conformity assessment procedures
- Applies to the central and subcentral government bodies

The WTO TBT Agreement (continued)

WORLD TRADE ORGANIZATION

- Requires transparency – notify proposed technical regulations early enough so that other members can learn about the proposals and have an opportunity to comment
- Requires that products from any source be treated no less favorably than domestic products
- Requires that technical regulations and conformity assessment procedures be no more trade restrictive than necessary
- Includes a Code of Good Practice for the preparation, adoption and application of standards

International Standards: Key Players

- International Organization for Standardization (ISO)
- International Electrotechnical Commission (IEC)
- International Telecommunication Union (ITU-T)
- U.S. domiciled standards developing organizations
- Government-based organizations – Examples:
  - International Maritime Organization (IMO)
  - World Customs Organization (WCO)
  - Codex Alimentarius

International Standards: ISO (and IEC)

- International standard setting body with representatives from national standards institutes of 164 countries - one per country
- Non-governmental
- Central Secretariat is in Geneva, but secretariats of technical committees held by members all over the world
- ISO has about 224 technical committees in all fields, except electrotechnical
- ~ 19,000 standards published
- U.S. has a single voice and participates through ANSI

International Standards: U.S. Engagement in ISO Work

- U.S. participation in any ISO committee is decided by a consultative process managed by ANSI
- ANSI usually appoints a willing SDO to manage U.S. representation in an ISO committee
- SDO organizes a Technical Advisory Group (TAG)
- TAG rules are published by ANSI, but SDOs have some flexibility in the administration of TAGs
- Membership fees in TAGs vary
- In TAGs, USG agencies may have different positions

International Standards: International Telecommunication Union (ITU)

- UN specialized agency for information and communication technologies (ICTs)
- Treaty-based organization
- Responsible for allocation of radio spectrum and satellite orbits, and for the standardization and development of ICTs worldwide
- 193 voting member states and 700+ non-voting private sector entities and academic institutions
- Secretary-General based in Geneva with 12 offices around the world
- U.S. participates through State Department
- U.S. has a single voice in ITU committees

International Standards:
International Maritime Organization

- UN specialized agency and global standard-setting authority for the safety, security, and environmental performance of international shipping
- Established in 1948
- Headquarters in London, United Kingdom
- 170 member states
- Type of Agreement: International conventions
- US Signatories:
  - Department of Defense
  - Department of Homeland Security, U.S. Coast Guard
  - Department of Justice
  - Environmental Protection Agency
  - National Oceanic and Atmospheric Administration
  - National Transportation Safety Board

INTERNATIONAL MARITIME ORGANIZATION

International Standards: World Customs Organization

- An independent intergovernmental body whose mission is to enhance the effectiveness and efficiency of Customs administrations
- Established in 1952
- 177 member countries plus the European Communities
- Type of Agreement: International convention
- US Signatories:
  - US Customs and Border Protection
  - Department of Homeland Security
- Framework of Standards to secure and facilitate global trade

Thank You

Questions?

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