

NIST

Standards Coordination Office



Fundamentals of Standards

September 17, 2015

Today's Discussion

- Standards History: Early Drivers for Standards
- Key terms
- U.S. standards landscape
- International Standards

Standards History: 1790 BC



Code of Hammurabi

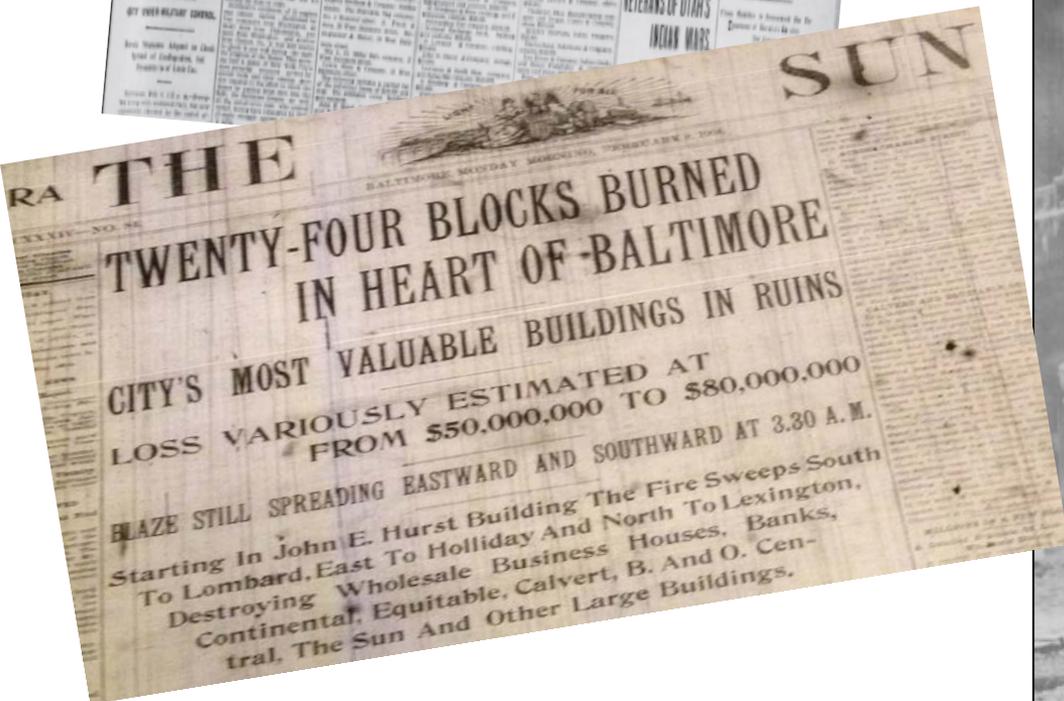
- An eye for an eye, a tooth for a tooth.

- 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: 1904

Great Baltimore Fire

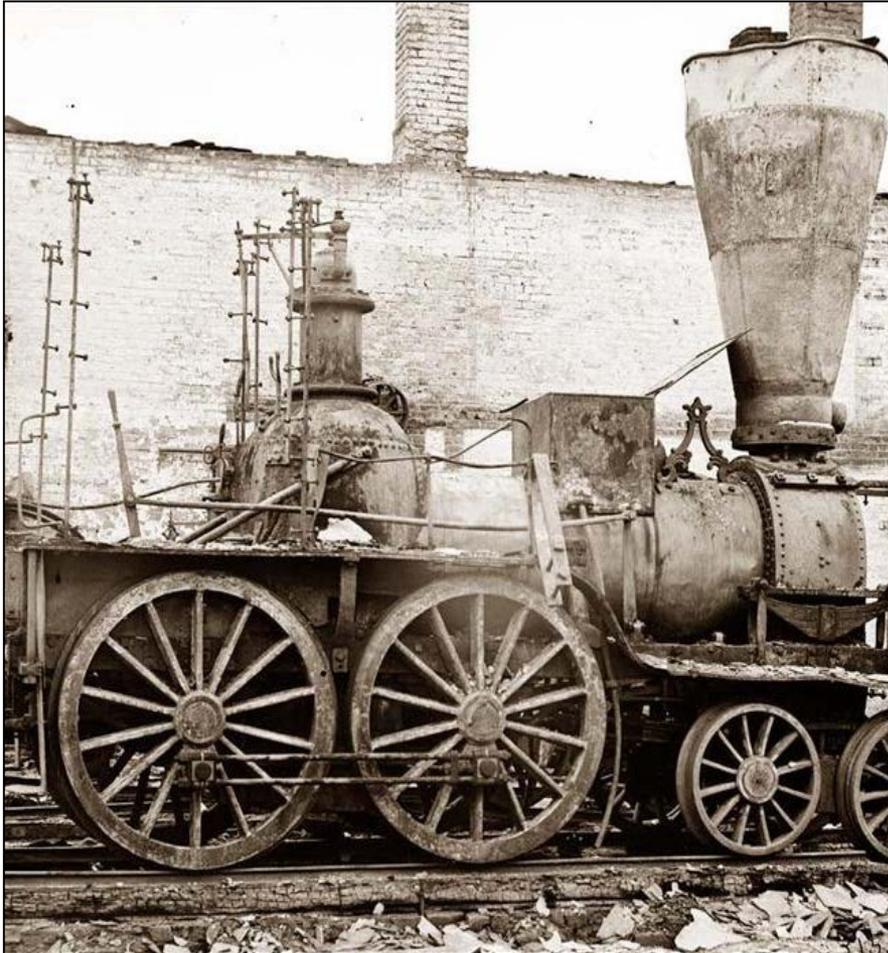


Standards History: 1911



New York City
Triangle Shirtwaist
Fire

Standards History: 1912-1923



Uniform Practice
in Manufacture
of Train Rails
and Wheels

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)

What is a 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)

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)

Other Terms for Standards

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

Voluntary Standards

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

Performance and Design Standards

- Performance standard - requirements expressed in terms of required results without stating the method of achieving the functional or operational results
- Design (or descriptive) standard - requirements expressed in terms of specific design requirements such as materials, construction, and dimensions
- Performance standards are preferred to design standards to accommodate innovation
- When requirements are expressed in terms of performance, it is harder to assess if the product meets the standards

USG and Standards

- National Technology Transfer and Advancement Act (NTTAA), March 7, 1996
- Office of Management and Budget (OMB) Circular A-119: Federal Participation in the Development and Use of Voluntary Consensus Standards and in Conformity Assessment Activities, February 10, 1998 (under revision)
- WTO TBT Agreement of 1995
- Trade Agreements Act of 1979, as amended

Law and policy require Federal agencies to use international voluntary consensus standards in regulation and procurement, except where inconsistent with law or not practical

U.S. Standardization System

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

One approach among many in the world



Key Concepts in Standards Development

Openness

All stakeholders may participate; no single interest may dominate

Transparency

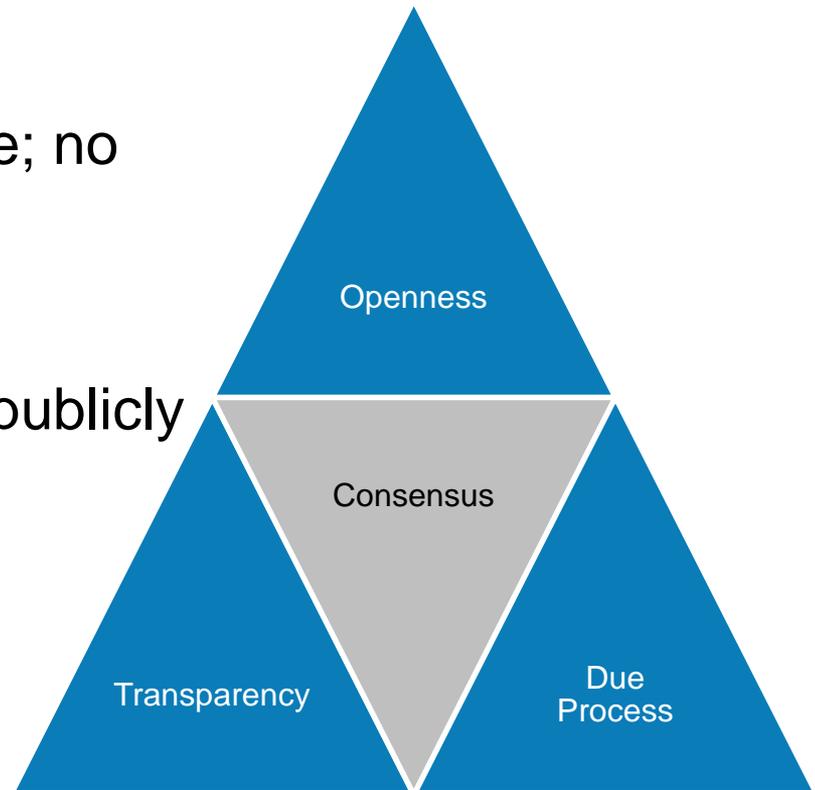
Records/ processes open and publicly available

Due Process

Appeals mechanism

Consensus

Decisions more than majority but not unanimity



What is Consensus?

General agreement, characterized by the absence of sustained opposition to substantial issues by any important part of the concerned interests and by a process that involves seeking to take into account the views of all parties concerned and to reconcile any conflicting arguments.

NOTE: Consensus need not imply unanimity. (ISO/IEC GUIDE 2:1994)

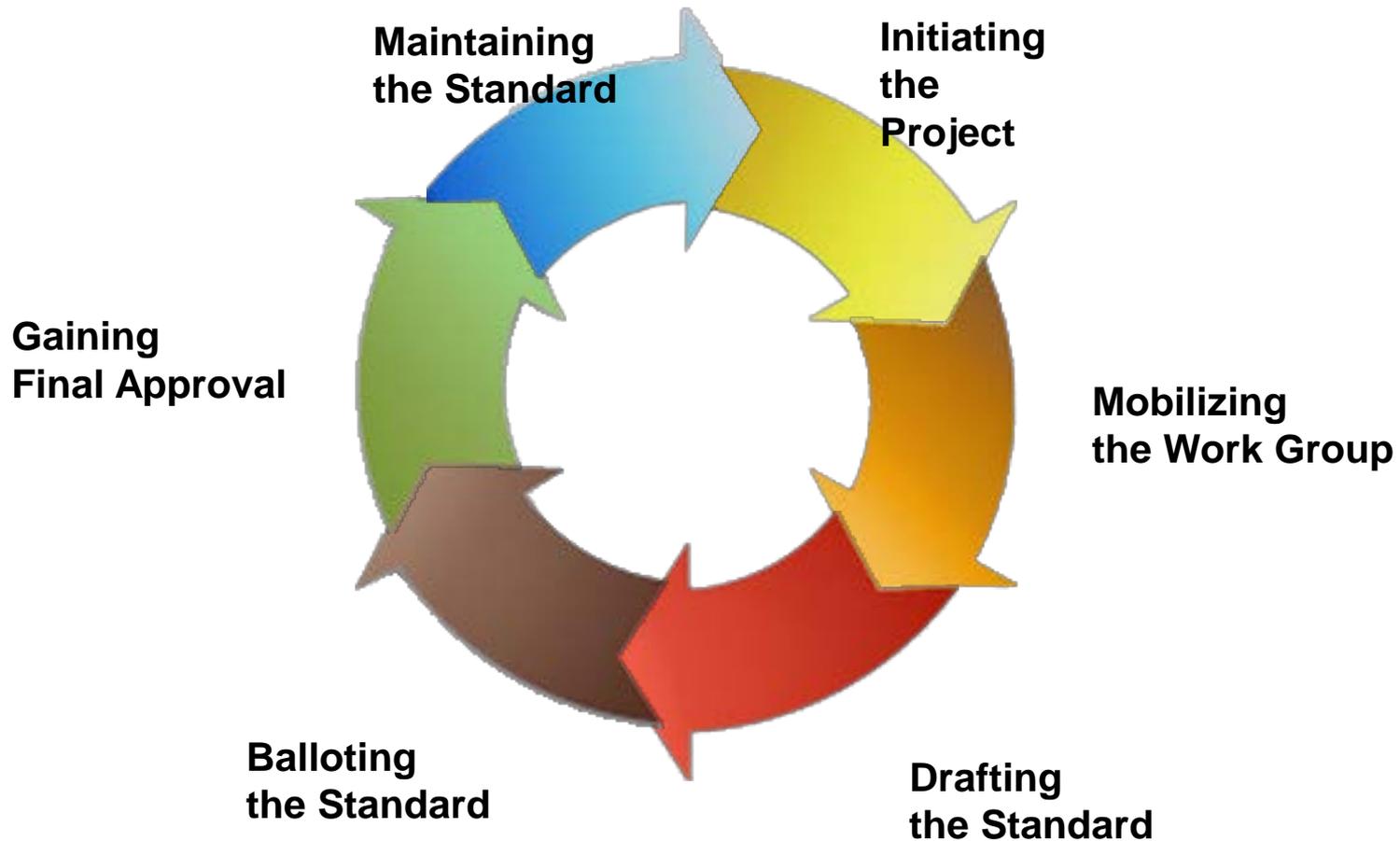
General agreement, but not necessarily unanimity, and includes a process for attempting to resolve objections by interested parties, as long as all comments have been fairly considered, each objector is advised of the disposition of his or her objection(s) and the reasons why, and the consensus body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

Consensus

- 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 Life Cycle



Key Players

1. American National Standards Institute (ANSI)
2. National Institute of Standards and Technology (NIST)
3. Standards Developing Organizations (SDO)
4. Consortia Standards Setting Organizations
5. Committee members who provide technical input

ANSI

- Founded in 1918 by 5 professional/technical societies and 3 federal government agencies
- Coordinates the U.S. standards system
- Does not write standards
- Accredits ~240 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

- Serves as the National Measurement Institute in the U.S.
- Approximately 1/3 of technical staff participate in standards development activities
- Provides substantial technical contributions in thousands of committees
- Is a key contributor and leader in the development and implementation of U.S. standards policy
- NTTAA related responsibilities

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



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

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

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

WORLD TRADE
ORGANIZATION



- 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
- Focuses on technical regulations and related conformity assessment procedures
- Applies to the central and subcentral government bodies
- Requires transparency – notify proposed technical regulations early enough so that other members can learn about the proposals and have an opportunity to comment

The WTO TBT Agreement (continued)

- 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

WTO TBT Decision on International Standards (2002)

Established principles for the development of international standards – transparency; openness; impartiality and consensus; effectiveness and relevance; coherence; and development dimension

Key Players: International Standards

- 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

ISO (and IEC)



- ISO is a member organization and is non governmental
- Members are the national standards institutes of 164 countries; one per country
- 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; about 19,000 standards published
- U.S. participates thru ANSI
- U.S. has a single voice in ISO committees and participates through ANSI

How the US is Organized for ISO Work

- U.S. participation in any ISO committee is decided by a consultative process managed by ANSI (NIST is represented)
- ANSI usually appoints a willing SDO to manage U.S. representation on 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 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





Credit: Scott Adams, <http://dilbert.com/strips/comic/2009-08-31>

Thank You

Questions?

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