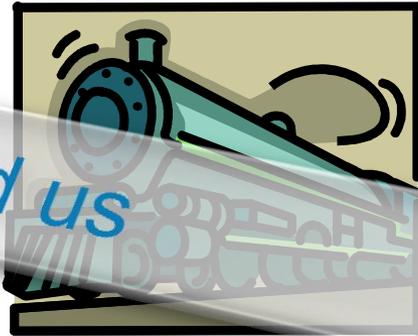
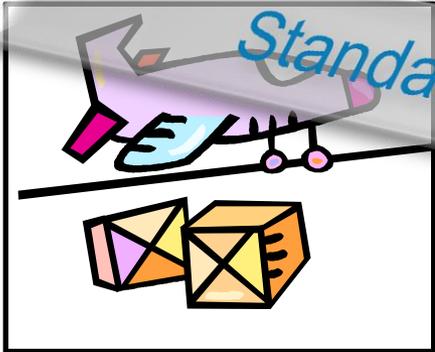
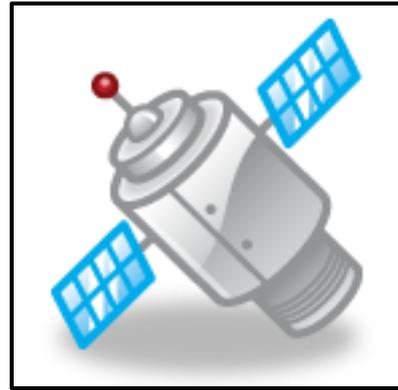


# NIST

Global Standards Information

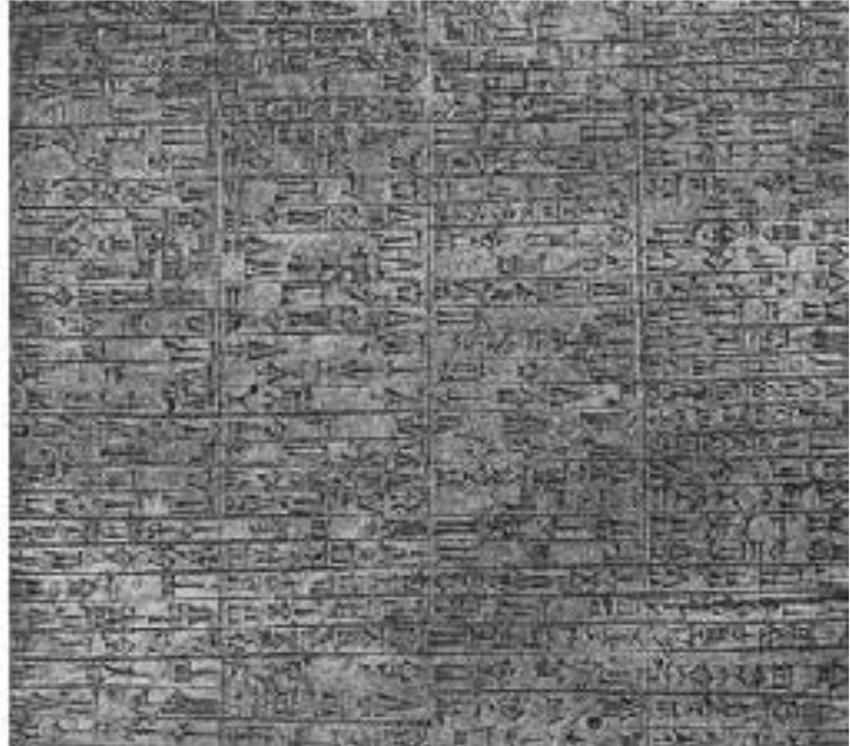


## Fundamentals of Standards



Standards are all around us

# Standards in History



# Early Drivers for Standards



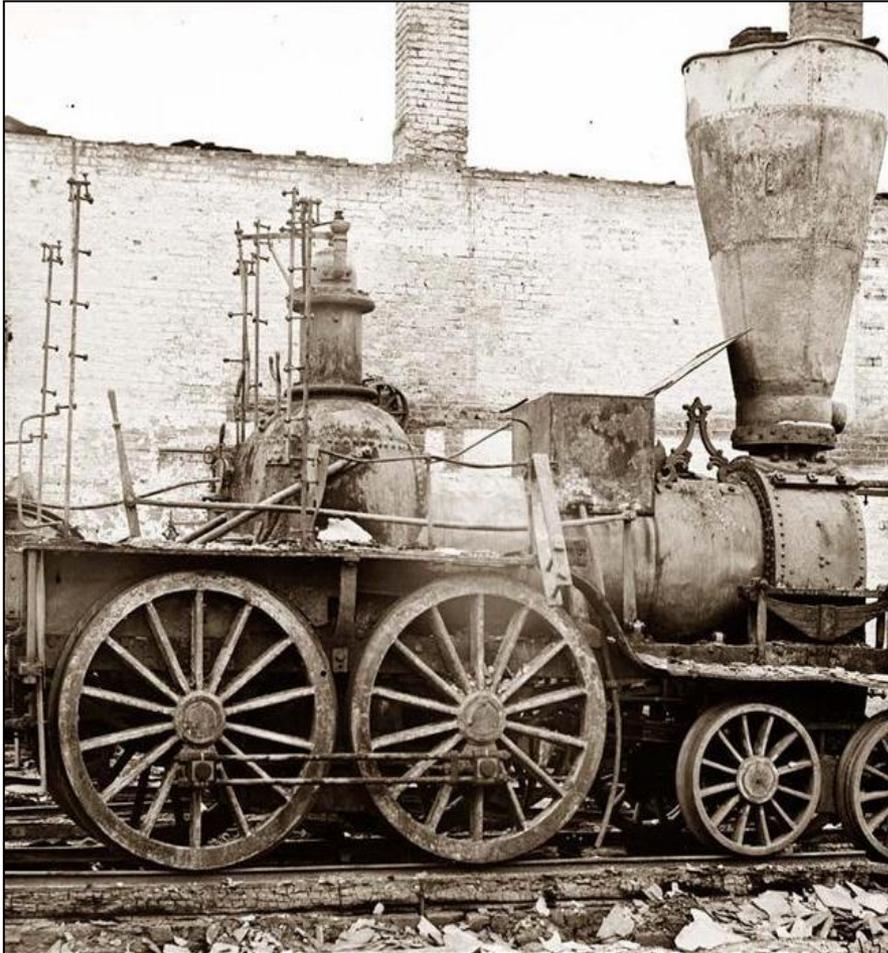
Baltimore  
Fire of 1904

# Early Drivers for Standards



New York City  
Triangle Shirtwaist  
Fire of 1911

# Early Drivers for Standards



Uniform Practice  
in Manufacture  
of Train Rails  
and Wheels

# Key Terms for Today

## **Standard**

**Documentary or normative standard**

**Voluntary standard and mandatory standard**

## **Measurement standard**

## **Regulation**

# Definitions of a Standard (1)

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. Note. Standards should be based on the consolidated results of science, technology and experience, and aimed at the promotion of optimum community benefits. (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)

## Definitions of a Standard (2)

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 and OMB Circular A-119 of 1998)

Market-driven technical specification for a product, service, person, process or system with which compliance is voluntary. (Anonymous)

# The U.S. Standards System

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

The system relies on cooperation and communication among:

- Private sector standards organizations
- Industry
- Stakeholders
- Government

# The U.S. Standardization Model – “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
- relies strongly on diversity and decentralization

# Key Concepts in Standards Development

## Openness

- all stakeholders may participate

## Transparency

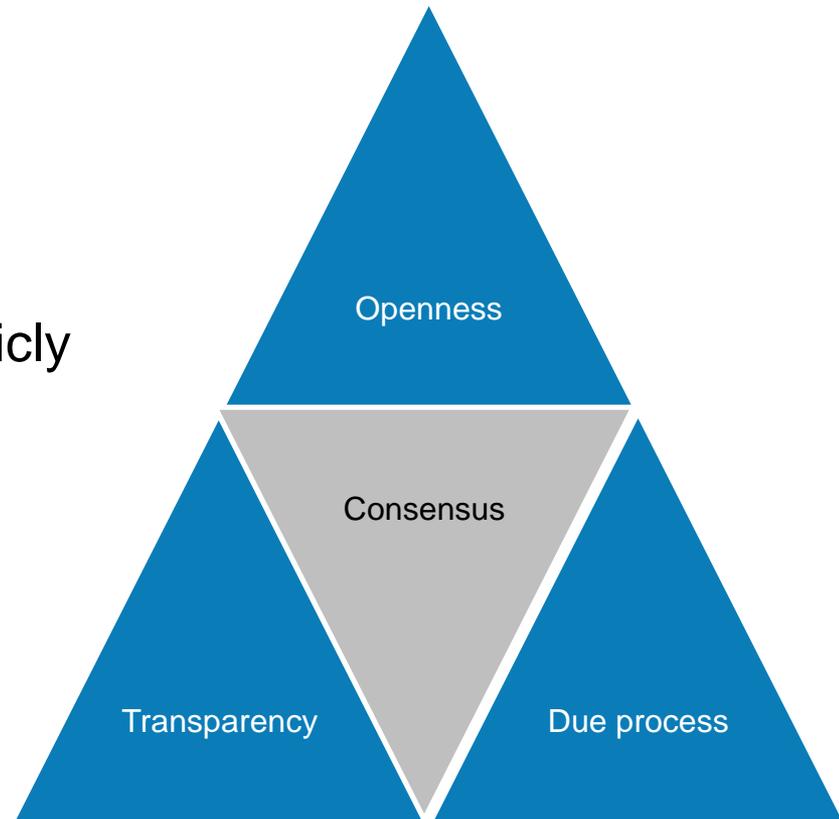
- records/ processes open and publicly available

## 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 when you see it!

The chairman of the technical committee is responsible to judge whether there is sufficient support and consensus to advance a standards draft, bearing in mind the definition of consensus. Participants should agree that consensus has been reached.

Consensus is not equivalent to balloting.

Consensus is a **process** and it needs to be achieved **in committee** at every stage of the process.

# Consensus-Based Standards Development

## Process

- Standards are written in committee
- Stakeholders proposes subject matter
- Proposer usually present a first draft
- Discussed at length
- Incorporate changes
- Balloting process
- Consider comments
- Possible re-balloting
- Final approval and publication
- Review (typically, every 3-5 years)

# Consensus-Based Standards Development

## Characteristics

- Structured process
- Lengthy, laborious process
- Consideration of all views takes time
- Consensus takes time
- Procedural safeguards take time
- Volunteers workforce
- Very expensive

# Performance and Design Standards

- Performance requirements – expressed in terms of required results without stating the method of achieving the functional or operational results
- Design (or descriptive) requirements – expressed in terms of specific design requirements such as materials, construction, dimensions
- Performance standards are usually 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

# Key Players and Organizations

- American National Standards Institute (ANSI)
- National Institute of Standards and Technology (NIST)
- Standards Developing Organizations (SDO)
- Consortia Standards Setting Organizations
- Key International Players
- Committee members who provide technical input

# ANSI



- ANSI is a federation of about 1,000 members
- Was founded in 1918 by five professional/ technical societies and three federal government agencies
- Coordinates the U.S. standards system
- Does not write standards
- Accredits standards developers (about 280 SDO's are ANSI-accredited); process to meet ANSI's essential requirements
- Represents the United States in the ISO and IEC

# NIST Helps to Ensure the Technical Efficacy of Documentary Standards

By participating as technical experts in the development of test methods; product, system, and process specifications; etc.

By participating in round robins to collect data to support the development of test methods

- NIST conducted tests for elevator fire safety which ASME used in its elevator and escalator safety codes

By providing standards needed to calibrate instruments used in test methods

- ASTM standards reference ~800 NIST Standard Reference Materials

# NIST Participates in Documentary Standards Activities

Approx. 400 staff members (nearly 1/3 of the technical staff) participate in about 120 voluntary standards organizations

- Organizations include international standards organizations, SDO's domiciled in the U.S. and consortia

Focus is on analytical testing, building and construction, health care, information technology, manufacturing, and telecommunications, infrastructure, energy, interoperability

# Standards Development to Meet National Priorities

Congressional mandate to NIST – to achieve an interoperable Smart Grid Standards Framework

NIST coordinates public and private sector in the smart grid space:

- Identification of standards needs and gaps
- Private sector develops standards
- Federal regulator considers standards developed through the process for their use
- Covers both standards and conformity assessment elements
- Open process enables global participation and input

# NIST Input to U.S. Standards Policy

*Private Sector* – NIST staff serve on ANSI and SDO policy committees

- Mechanism to provide input
- Informs NIST activities

*Public Sector* – NIST co-chairs the recently established National Science and Technology Council's Sub-committee on Standards

- Intersection of technology, innovation, competition and trade related issues with standards
- U.S. government agencies' involvement in standards and standardization

# 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
- **Other organizations**



# Consortia

**Consortia** are groups of companies that come together to create a standard to address a (typically single) commercial need

## **Characteristics:**

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

# ISO and IEC



- ISO and IEC are member organizations, with participation by National Standards Body
- ANSI represents U.S. interest in ISO and IEC
- All U.S. stakeholders participate thru ANSI
- To participate in ISO and/or IEC work, U.S. stakeholders must abide by ANSI rules and process

# How the US is Organized for ISO Work

- U.S. participation in any ISO committee is decided by a consultative process managed by an ANSI committee (NIST is represented)
- ANSI appoints a willing SDO to manage U.S. representation in an ISO committee
- The SDO organizes a TAG or Technical Advisory Group (or mirror committee)
- TAG rules are published by ANSI
- SDO do have some flexibility in the administration of TAGs

# What is an International Standard?

The WTO TBT Agreement states:

2.4 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.

# WTO TBT Decision on International Standards (2002)

The Decision established the following principles for the development of international standards.

- Transparency
- Openness
- Impartiality and consensus
- Effectiveness and relevance
- Coherence
- Development Dimension

Thank You

Ileana Martinez

International Affairs Advisor

Standards Coordination Office, NIST

[ileana.martinez@nist.gov](mailto:ileana.martinez@nist.gov)

301-975-2766