

# NIST

Standards Coordination Office



## Standards 101: Domestic Standards

June 2016

# Today's Discussion

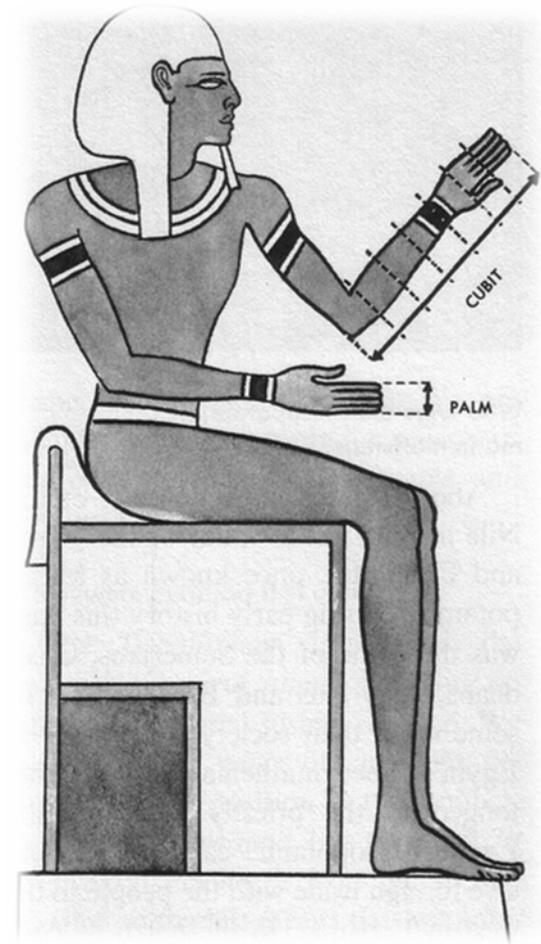
- Standards history
- Standards: terminology, key terms, types of standards, & principles
- U.S. standardization system
- Standards development

# Standards Now: Standards all around us



# Standards History: 3000 BC

Measurement Standard: Royal Egyptian Cubit



Length = 20.6 inches



# Standards History: Early 1900s

Standard Reference Materials & Standard Practices: Train rails, wheels, flanges, and axles



Train wreck at Ostrander 2-25-1913

# Terminology: Definitions for “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. (*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 (*OMB Circular A-119 of 1998 and 2016*)

# Key Terms

## STANDARD

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

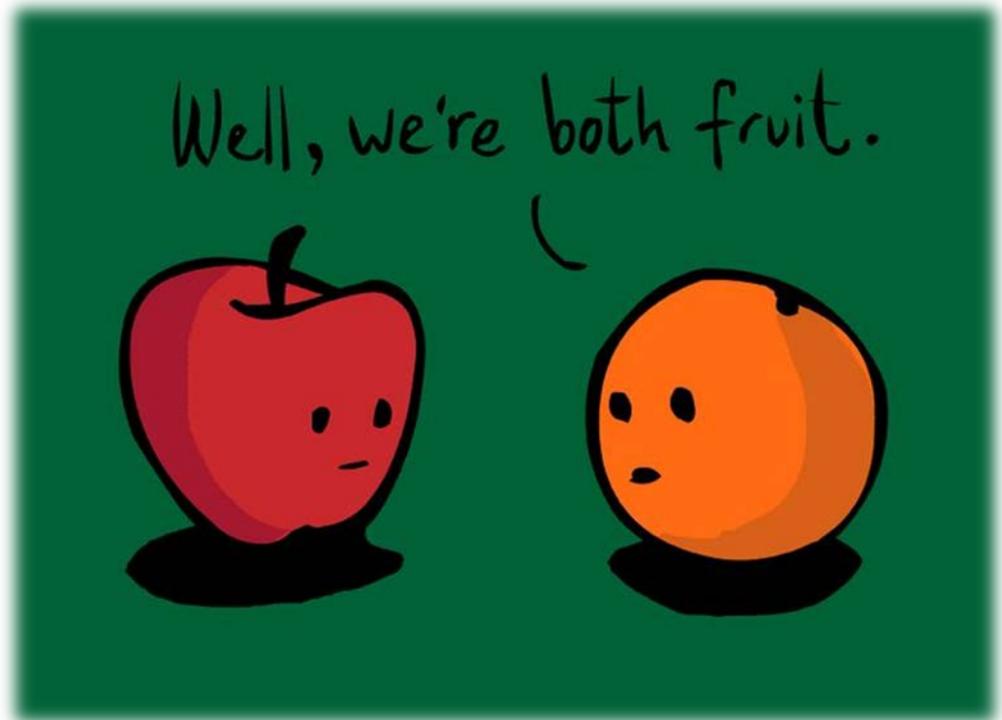
## TECHNICAL REGULATION

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

**Tricky Question: When is a voluntary standard no longer voluntary?**

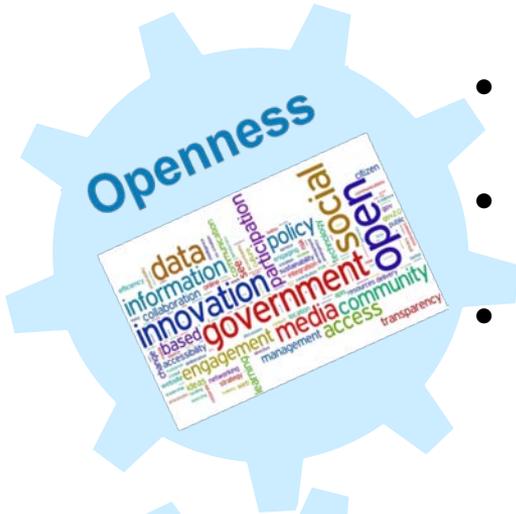
# Types of Standards

- Recommendation
- Practice, best practice
- Guide, guideline, guidance
- Specification
- Test Method
- De facto standard
- Code





# Key Principles



- All interested parties may participate; no one is excluded
- No unreasonable financial barriers to participation
- Voting membership not conditional or restricted to a particular type of participant

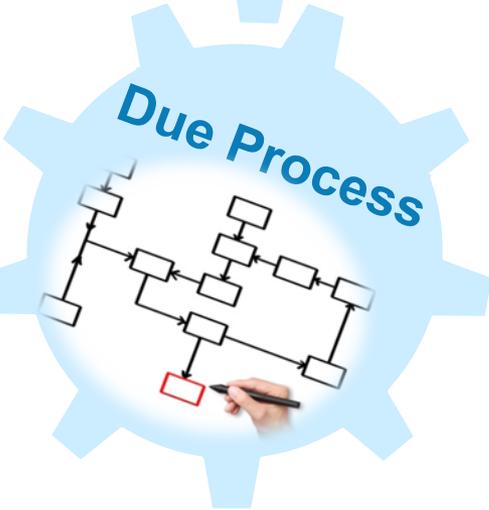


- Balance of interests
- Balance of influence
- No single interest may dominate

# Key Principles



- Records and processes open and publicly available
  - *Governance documents, annual reports*
- Open meetings



- Fairness and equity: any person may express a position and its basis, have that position considered, and have the right to appeal
- Documented processes and procedures, including appeals mechanism

# Key Principles



- Consensus is defined as general agreement, but not necessarily unanimity. During the development of consensus, comments and objections are considered using fair, impartial, open, and transparent processes. (*OMB Circular A-119 of 2016*)
- You know it when you see it
- Consensus is not the same as balloting
- Needs to be achieved in committee at every stage of the process



*“A genuine leader is not a searcher for consensus but a molder of consensus.”*

# U.S. Standardization System: How it works

- Led by private sector standards development organizations (SDOs)
- Is a public-private partnership
- Is voluntary, decentralized, sector and market-driven and is, sometimes, competitive and duplicative.
  - *Differs significantly from the centrally-coordinated standards systems common in many other countries*
- Reflects U.S. culture, traditions, & public-private sector dynamics
- Relies on cooperation and communication among:
  - Industry
  - Private sector standards organizations
  - Stakeholders
  - Academia
  - Government



# U.S. Standardization System: Statistics

- Estimated to be hundreds of “traditional” standards development organizations (SDOs) and hundreds more “non-traditional” SDOs, such as consortia.
- 20 largest SDOs produce 90% of the standards.
- >250 accredited U.S. SDOs
- >11,000 American National Standards



Figures as of 2015; from [www.ansi.org](http://www.ansi.org)

# U.S. Standardization System: Uncle Sam's Footprint

- 3,085 U.S. government employees work with > 552 standards development organizations (SDOs)
- 13,503 citations to standards in the Code of Federal Regulations from 371 standards organizations/sources
- 32 departments/agencies are members of the American National Standards Institute (ANSI)



From: *NTTAA annual report*

# U.S. Standardization System: Key Players



# U.S. Standardization System: ANSI

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



# U.S. Standardization System: NIST

- Is a key contributor and leader in the development and implementation of U.S. standards policy
- ~1/3 of technical staff participates in standards development activities, including committees, round robins, standard reference material development, etc.
- Coordinates with other Federal agencies and state and local governments to achieve greater reliance on voluntary standards and less dependence on government-unique standards



# U.S. Standardization System: SDOs & Consortia



Standards development organizations (SDOs) can be...

- Professional societies
- Trade associations
- Testing and certification organizations
- Organizations that only develop standards



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

- Quick standards setting
- Most often joint ventures that are “pay to play”
- Enormous variation among consortia in terms of openness, transparency and consensus



# Standards Development: BIG Busine\$\$

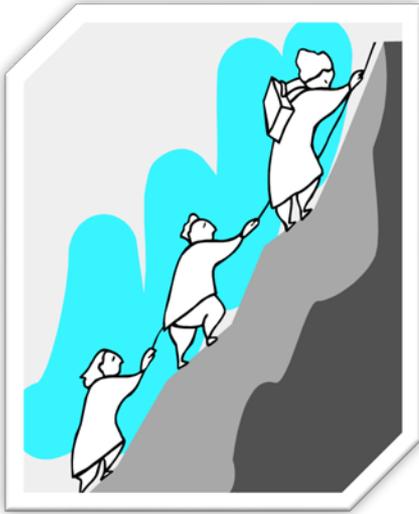
Org.	Standards Scope	Statistics	Members & Committees	Annual Revenue from sale of standards
ASTM Intl.	Characteristics and performance of materials, products, systems & services	12,000+ standards >140 technical committees	>30,000 members from 140 countries	~\$69 million (2014)
ISO	All disciplines except electrotechnical and telecommunications	20,493 standards 238 technical committees	165 member countries	\$38.9 million (2014)
IEEE	Electrical, electronics, communications, computing, networking, wireless	~1,300 standards	>400,000 members from 160 countries	\$37.3 million (2015)
NFPA	minimize the risk and effects of fire by establishing criteria for building, processing, design, service, and installation	> 300 standards > 250 committees	>9,000 standards committee members (~64,000 members)	~\$86,000 (2014)
W3C	Web standards	~90 standards 44 working groups	423 member companies	0

# Standards Development: What Standards Development Organizations (SDOs) do



- Facilitate the process of standards development
- Provide the structure and organization
- Support the work of the committees
- Publish standards
- *SDO staff members do not develop standards – committee members develop standards*

# Standards Development: Process & Committee Members

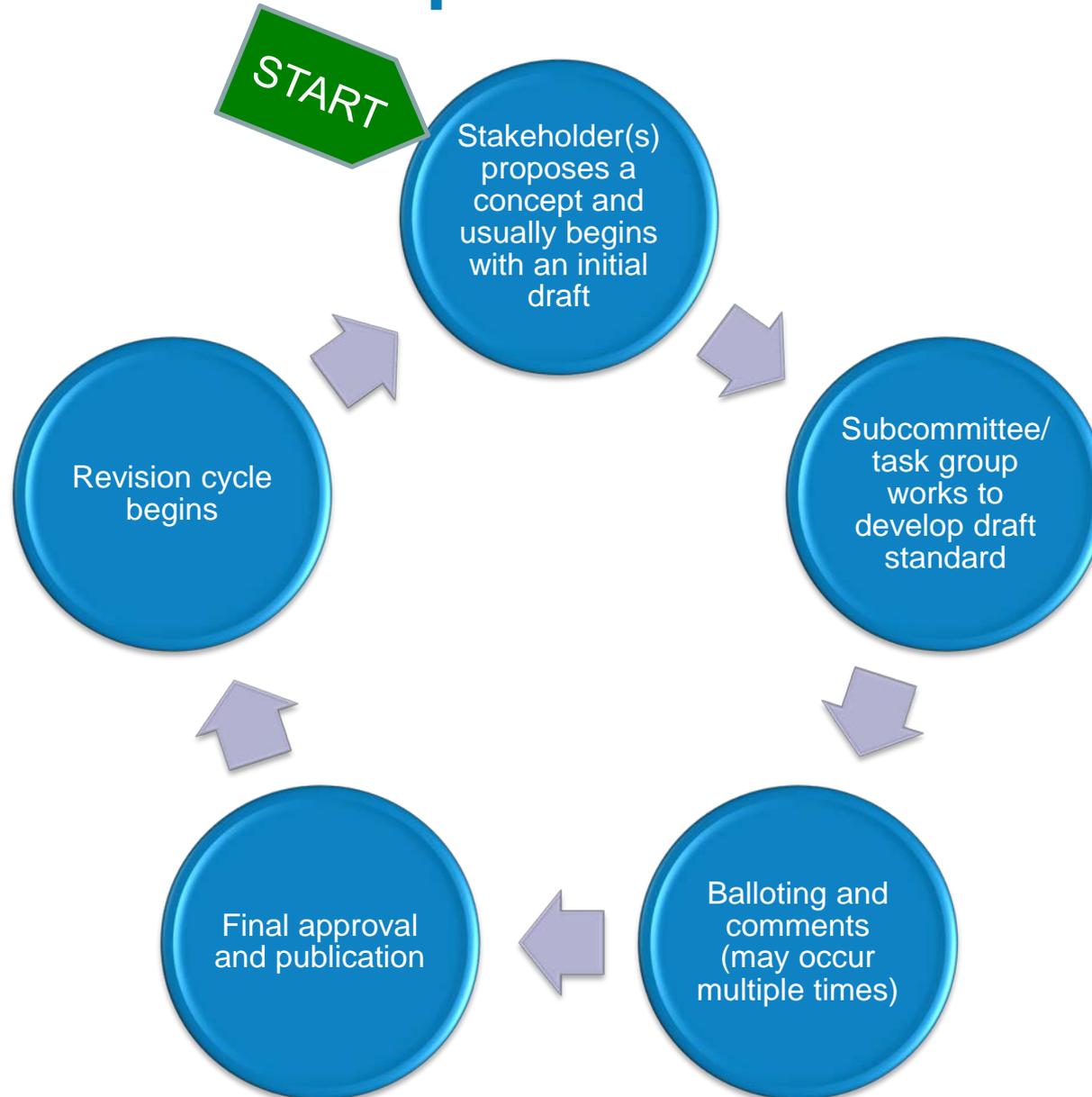


- Structured process
  - Lengthy and laborious
  - Takes time for consideration of all views, achieving consensus, procedural safeguards

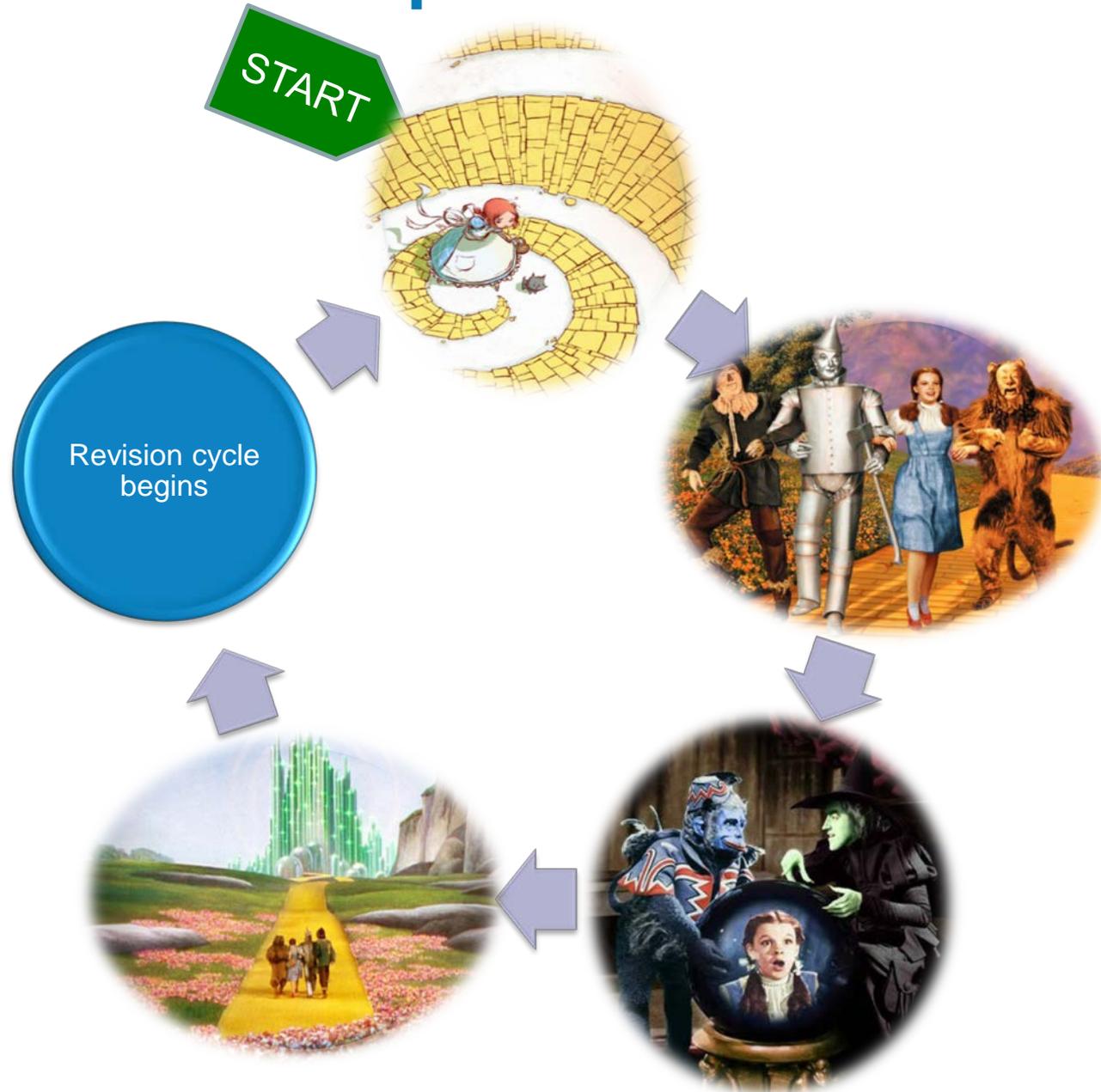


- Committee members
  - Industry, subject matter experts, end users, and other stakeholders
  - Provide their knowledge, expertise, end user experience, or other technical input
  - Heart and soul of standards development

# Standards Development: General Process



# Standards Development: What it's really like



Thank You

Questions?

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