

# Improving Standards Development and Implementation

**Keith Peden**

**keith.peden brooks.com**

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## Outline

**Goal: 1) Improve SEMI standards definition and  
2) software implementation process**

**1) Initiating SEMI Standards Improvement Task  
Force**

**2) Initiating ISMT/SEMI Software Issues Action  
Council**

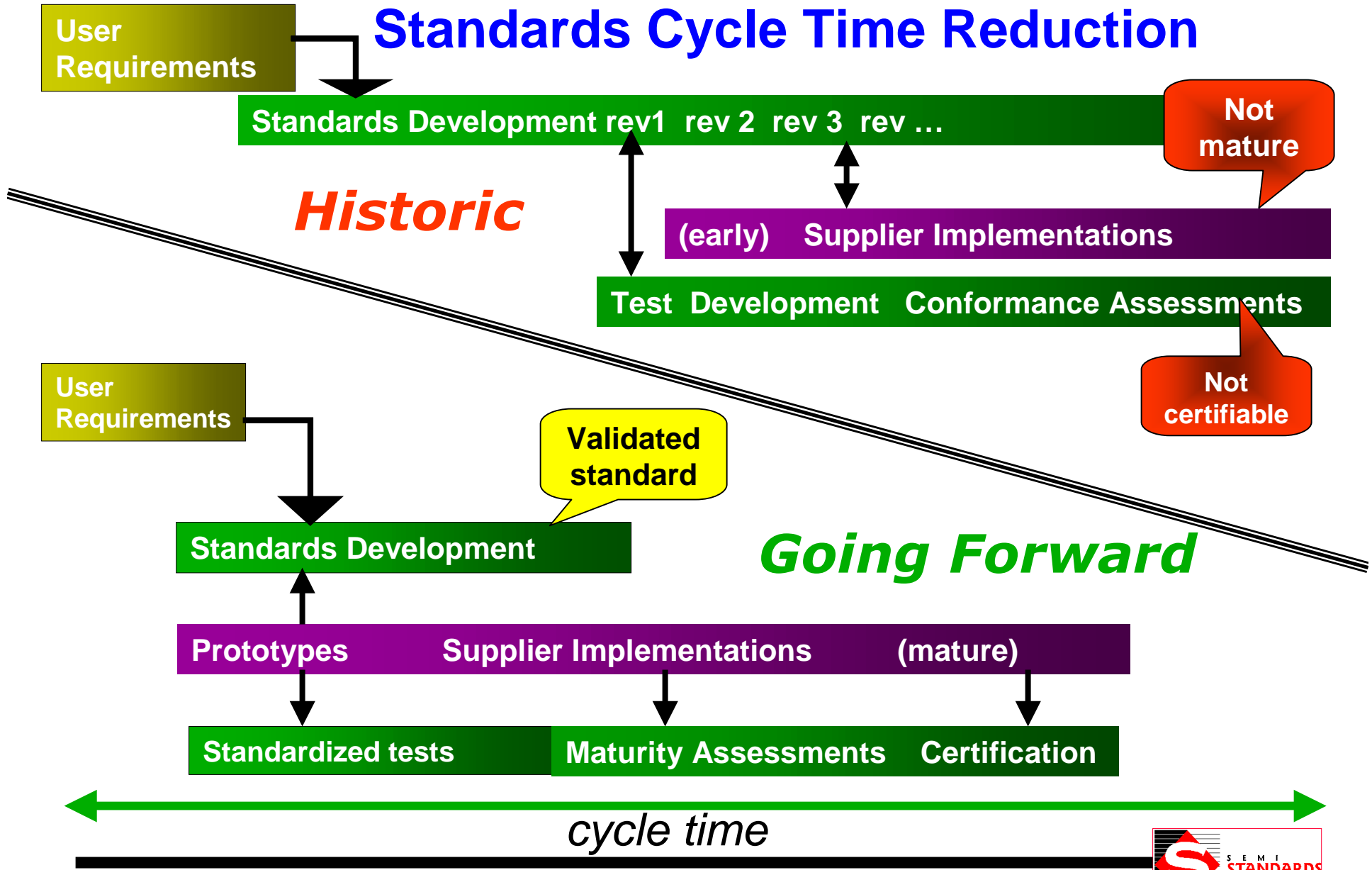
## Purpose

- Reduce the standards development **cycle time**
- Improve the **quality** of the standards
- Improve the **usability** of standards
- Provide **testable** standards

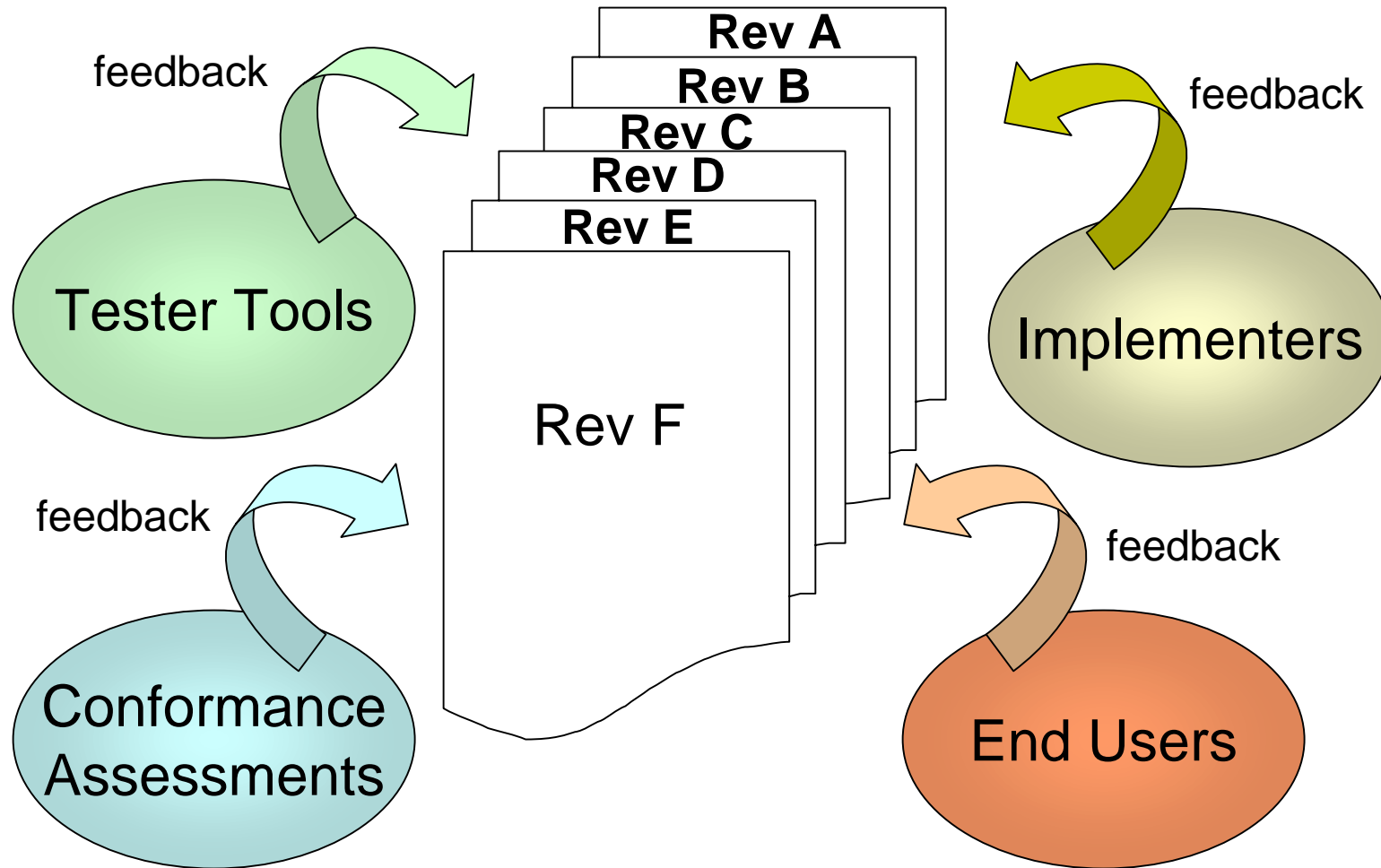
## Improvement Needed

- **Reduce cycle time** from guidelines to robust implementations
- Improve the **quality** of standards for ease of implementation and conformance testing
- Provide implementation **guidance** with the standards to meet the needs of the end users (including implementation roadmap)
- Enable industry standardized testing to measure **conformance** to standards and end user requirements
- Provide standards in **useable** format that allows traceability

# Standards Cycle Time Reduction



## Standards Revisions *AFTER* Implementation



**Historical Perspective**

# Standards Development

- Improve quality of standards
  - Clear implementations requirements in standards
  - Develop and write SEMI standards for testability
  - Detailed compliance tables, mapping to test requirements
- Prototype in early development of standard
  - Proof of standards concept
  - Identifies gaps in standard
  - Reduces number of revisions required
  - Early scenarios for test development
  - Verifies proposed standard

## Standards Usability and Traceability

- .pdf is difficult to migrate into software and tester implementations
- Need access to archived copies of old versions for tracking changes
- Need traceability to implementations and test results

## Education and Dialogue

- Incorporate industry usage and requirements into the standards development and implementation guidance?
- Need supplier / end user communication throughout the cycle – from guidelines to conformance
  - Workshops
  - Users groups
  - STEPs
  - Are these enough?
  - Can we do better?

# Implementation

- Early implementations
  - Early supplier/IC Maker engagement to accelerate and improve implementations
  - Maturity assessments to improve implementations based on standardized tests
- Standard conformant implementations that meet the needs of the end user
  - Industry repository for implementation guidance (test requirements, scenarios, use cases)
  - Update and maintain scenarios and use cases
  - Increase emphasis on full production and high volume manufacturing
  - Include more exception handling

## Documenting Requirements

- ISMT will publish an update to the ISMT Standards Conformance Assessment Guidelines in July 2003
- Available at [www.sematech.org/public/resources/stds/certification.htm](http://www.sematech.org/public/resources/stds/certification.htm)
- This document will be accompanied by an example of extracting standards requirements from a standard (E37.1)
- In addition to the standards requirements, a description of the test against each requirement is provided

# E37.1 Requirements Study

Standard Requirement ID	Standards Requirement text	Modes allowed by the standard	Section - Paragraph Sentence	Test Requirement ID	Test Requirements text	Test algorithm ID	Category	Classification: F=fundamental A= Additional O=Optional
RQ E37.1-30	Old State: <i>HSMS selected</i> New State: <i>TCP/IP not connected</i> Close TCP/IP connection	Active connect mode	5.6 (Table 2) Item 5.5	TR-30	Local entity in in "HSMS Selected" state. Remote entity sends an HSMS message whose length is greater than the maximum allowable. Expected Results: Local entity closes the TCP/IP connection.		Active Mode Connect - From <i>HSMS Selected</i> to <i>TCP/IP Not Connected</i>	<b>F</b>
RQ E37.1-31	Old State: <i>HSMS selected</i> New State: <i>TCP/IP not connected</i> Close TCP/IP connection	Active connect mode	5.6 (Table 2) Item 5.6	TR-31	Local entity in in "HSMS Selected" state. Remote entity sends an HSMS message containing an invalid header. Expected Results: Local entity closes the TCP/IP connection.		Active Mode Connect - From <i>HSMS Selected</i> to <i>TCP/IP Not Connected</i>	<b>F</b>
RQ E37.1-32	Old State: <i>HSMS selected</i> New State: <i>TCP/IP not connected</i> Close TCP/IP connection	Active connect mode	5.6 (Table 2) Item 5.7	TR-32	Local entity is in "HSMS Selected" mode. Remote entity sends an HSMS message byte, waits T8 length of time before sending another byte. Expected Results: Local entity closes TCP/IP connection		Active Mode Connect - From <i>HSMS Selected</i> to <i>TCP/IP Not Connected</i>	<b>F</b>
RQ E37.1-33	Old State: HSMS Selected New State: HSMS Selected Cancel data transaction as appropriate but do not close the TCP/IP connection If entity is EQUIPMENT send SECSII S9F9	Active connect mode.	5.6 (Table 2) Item 6.1	TR-33	Local entity is in "HSMS Selected" mode. Local entity is "equipment". Local entity sends a data request message. Remote entity does not respond. Expected Results: Local entity cancels the data transaction, but does not close the TCP/IP		Active Mode Connect - From <i>HSMS Selected</i> to <i>HSMS Selected</i>	<b>F</b>

## E116 Requirements Study

- SEMI's analysis of standard
  - Unable to automate requirements extraction, missing “must”, “shall”, etc. Need to get beyond use of .pdf so searches can be done.
  - Four hours work generated this table
  - No references to Requirements for Compliance section

# E116 Requirements Table Example

Section etc.	Subject	Requirement	Comments
6.1	EPT compliant implementation	Provision of certain capabilities defined by other standards: accessibility to status information, event reporting, alarm management, and provision of an internal time-and-date clock.	
6.2	EPT compliant implementation	Support of SEMI E90.	
6.3	EPT compliant implementation	A documented list of all EPT modules contained within the equipment.	
6.4	EPT compliant implementation	An EPT state model for the equipment and for each EPT module.	
6.5	Each EPT module	A documented list of tasks that the module may perform.	

## 1) Standard Improvement TF (SITF)

- Purpose: This newly approved Global Information & Control Committee (I&CC) Task Force would focus on improving the standards development process and conformance of implementations to those standards
- Initial focus is on I&CC standards
- Target the new or current standards under development

## 1) Standard Improvement TF (SITF)

- Chairs:
  - I&CC: Keith Peden
  - ICMakers: Jackie Ferrell, Harvey Wohlwend
  - OEMs: Leadership requested
- Current Members:
  - Les Marshall, Keith Peden, Karl Gartland, James Martin, Peter Cross, Lorn Christal, Gino Crispieri, Mark Pendleton, Lance Rist, Brad Van Eck, Ron Denison, Blaine Crandell, Bob Hodges, Mitch Sakamoto, Jesse Ring, David Walsh, Jack Ghiselli, Larry Hartsough, Kensuke Uriga
- SEMI Advisors:
  - Bruce Gehman, Arezou Khorasani

## Candidate Activities of the SITF

- Provide examples of good standard development and report Best Known Methods
- Define a requirements management policy and process for standards documents
- Update checklist and guidelines for writing standards
- Educate TF leaders on SEMI standards process, could create a systematic approach/checklist, define required skills for TF leaders, e.g., diplomacy, organizational
- Improve approach to “Requirements for Compliance” section, consider how to test for compliance
- Benchmark other industries approach (e.g., NIST, IEEE, W3C, ISO, RosettaNet, OMG, OPC, ODBA)
- Survey implementers on major standards development and deployment issues

## 2) Software Issues Action Council

### Background:

- Software is now critical to our industry
- 300mm factory software issues
- Interpretation of standards and other requirements issues
- Shared stake in identifying and solving software issues



## 2) Software Issues Action Council

### Action:

- Start a series of ISMT/SEMI organized teleconferences
- Identify root causes
- Plan:
  - In-depth discussion of top issues
  - Prioritizing the issues
  - Brainstorming proposed solutions
  - Determining solution priorities
  - Determination of what is “in scope” to address

### To participate contact:

Harvey Wohlwend, ISMT, 512.356.7536, [harvey.wohlwend@sematech.org](mailto:harvey.wohlwend@sematech.org)

or

Bruce Gehman, SEMI, 408.943.6974, [bgehman@semi.org](mailto:bgehman@semi.org)



## Summary

How we develop and implement standards and software is an industry wide concern.

Action is being taken.

Your involvement is encouraged.