



Adaptivity and Design for All in Standardization

How Considering Accessibility in Standards Development Can Help Create a Safer World for Everyone

Grace Callahan
UL Standards & Engagement (ULSE)
Grace.Callahan@ul.org

About the Presenter

Grace Callahan is a Senior International Standards Project Manager at UL Standards & Engagement. She leads organizational work to ensure accessibility and the safety of people with disabilities are incorporated into standards development.

She serves as Secretary for the United States Technical Advisory Groups to:

- International Electrotechnical Commission Systems Committee on Active Assisted Living
- International Organization for Standardization Technical Committee on Ageing Societies





What is a Standard?

Standards can identify specific design or technical characteristics of a product and test products by simulating their performance under actual service conditions.

A standard is a document that provides requirements, specifications, guidelines, or characteristics that can be used consistently to ensure that materials, products, processes, and services are safe and fit for their purpose.

Standards influence product design.

Designs that aid people with disabilities can make life easier and safer for everyone.



Managing Overlap in Accessibility Standards

- Scope (product specific vs system level)
- Audience (industry implementation vs regulatory frameworks)
- Timing (emerging practices vs established consensus)

ULSE actively works to:

- Align technical content with international and regional standards
- Contribute expertise through ISO/IEC and regional committee participation
- Use UL standards as input towards broader harmonization



Standards Organizations Compliment, Not Compete

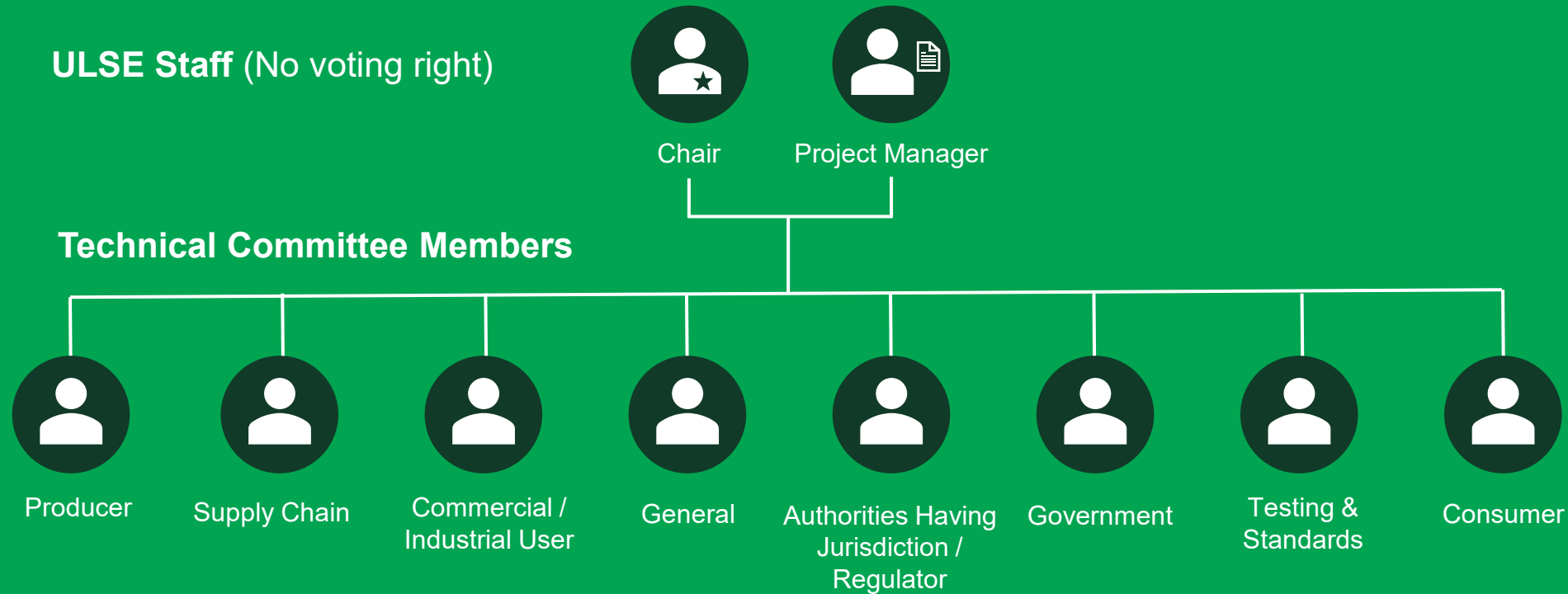
UL Standards & Engagement

- Market-driven standards and conformity assessment
- Strong focus on safety, performance, and real-world implementation
- Close connection to testing, certification, and applied research

ISO/IEC/ETSI/CEN-CENELEC

- Formal international or regional consensus bodies
- Often linked to public policy, regulation, and regional harmonization

Overview of ULSE Technical Committees



- Consensus body that votes and approves UL standards
- Committee with a balance of interests (no category greater than 1/3 of total)
- Open to anyone
- No fee to participate

● Accessibility and Standards

“Standards can help bring **accessibility into the real world** where it can have an impact.

Accessibility should be a **shared concern** for the technical committee, but not everyone has experience in it.

A lot of times people do not know that they are **creating barriers.**”

— Dr. J Bern Jordan, UL 3300 Technical Committee Member
(**Service, Communication, Information, Education, and Entertainment Robots**)



UL 3300: Service, Communication, Information, Education, and Entertainment Robots

Addresses the safety of SCIEE robots intended to perform tasks independently in public/commercial spaces and interact with people to help increase convenience, customer service, and efficiency.

Robots shall be constructed to cause no risk of harm to persons or surroundings when stationary or mobile.



Real-World Applicability with Human-Robot Interactions

- UL 3300 accounts for human-robot interactions including people with disabilities.
 - **Multifrequency outputs** can be considered to account for people with hearing loss.
 - Consideration should be given to **flash rates to reduce seizures** due to photosensitive epilepsy.
 - Warning against indicators in which the only **visual difference is color**.
 - Test cases for manufacturers to consider in functional safety verification and validation including obstacles such as **wheelchairs, walking canes, and walkers**.



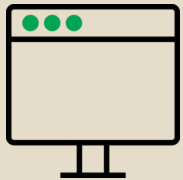
What happens when people with acquired or progressive conditions that affect speech try to use voice-enabled products?

They don't always work.

The majority of voice recognition technology is trained using recordings from audiobooks.

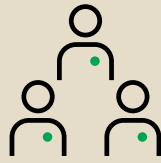


Leveraging Inclusive Data and Research in Standardization



THE PERFORMANCE ISSUE

Technologies that use speech recognition are not fully accessible for many people with diverse speech patterns.



DATA COLLECTION

Major tech companies are supporting a project by the University of Illinois Urbana-Champaign to collect representative speech samples



DATA LIMITATIONS

Speech recognition is powered by machine learning without diverse, representative data.



IMPACT ON STANDARDS

ULSE is US TAG admin for ISO Syc AAL, covering smart speakers and connected homes, and recruited Principal Investigator for the project for TAG.

18 to 60%

Accuracy gains reported by Microsoft using the project data



The How: People Can Help Drive Accessible Standards

Get Involved in Standards Development to:

- Provide input on technical content and influence the requirements and guidelines for products.
- Meet and develop relationships with other stakeholders in an industry
- Help increase consumer trust and interoperability, positioning products for access to new and existing markets.





500

technical
committees



4,300+

TC members

40+

countries
represented on
TCs



1,700+

standards published



20%

international
membership
on TCs

**Get involved in
standards
development and
apply to become a
TC member:**



Addressing Accessibility in Standards Development

Challenges

- In many standards systems, consideration of accessibility is **not yet mandatory**, presenting a structural challenge—and an opportunity—for standards developers.
- Lack of **availability of data** including people with disabilities and use in technical requirements
- Gaining **technical committee awareness** and supporting for considering accessibility in standards.
- Increasing **representation** and participation of people with disabilities in standards development.

Key Takeaways

- **Accessibility considerations are relevant to safety and performance.** Not considering accessibility can have safety consequences.
- **Accessibility is actionable.** Even when data is limited, explicitly stating assumptions and gaps enables informed consumer decision-making.
- **Collaboration drives impact.** Engaging technical committees with evidence can support updates in standards.
- **Next Steps:** Exploring accessibility of standards development process using guidelines by the Inclusive Design Research Center



**Standards &
Engagement**