# MODERN TOOLS FOR IMPROVING THE DEVELOPMENT OF ACOUSTICAL STANDARDS

Christopher J. Struck
*CJS Labs*
*57 States Street*
*San Francisco, CA 94114*

## Introduction

In the past, the development of acoustical standards has largely followed on the trailing edge of technology. Given the progressively more rapid development of new technology, it is critical that new standards be developed when needed in the timeliest manner possible. Furthermore, participants in working groups are volunteers with limited time available for this important work. Budgetary constraints may also limit travel to in-person meetings for many persons otherwise interested in participating and whose practical experience is essential to the process. On-line meeting and collaboration tools enable shorter, more effective, and more frequent meetings to move draft standards more quickly to a ballot-ready document. Documents can be edited collaboratively in real time using standard mark-up tools for immediate feedback from participants. This also enables participation across time zones. The use of a password protected "cloud network" ftp site for working group documents (e.g., drafts, reference documents, meeting minutes, etc.) eliminates unnecessary E-mail traffic with large attachments and enables participants to access documents at any convenient time. A number of tools and practices can be leveraged to improve the contemporary standards development process. A case study shows how this worked in practice.

> *"Working Group S3-37 was able to reduce the entire development time for a revision to just under 9 months in 2009."*

## Issues with the Process

It is the job of the working group chair to engage the group members, coax time out of their already overloaded schedules, as well as to garner consensus on sometimes contentious issues. Standards work, by its very nature, is done by a 'Volunteer Army'. That is to say, it is no one's full time job. In the past, the logistics of standards work meant that a working would typically meet face-to-face once or perhaps twice per year. In these economic times, even this may be prohibitive.

Practically, there are also issues with gathering information from the participants in an organized fashion, document review, sharing and version/change control, communications, and generally working in a collaborative fashion.

Figure 1 shows a diagram of the Acoustical Society of America (ASA) standards development process. From the perspective of a working group member (or chair), there are many decision points and actions outside the direct control of the working group itself. However, it can quickly be seen that the major development delay is with the working group. However, it can quickly be seen that the major development delay is with the working group itself. Not only is 3 years a long commitment from the working group members, but given the progressively more rapid development of new technologies, it is also critical that a new standard is issued in the timeliest manner possible. Rather than revolutionize the entire process, focus was on improvement of this critical path.

## A Success Story?

The annotation in the diagram indicates that Working Group S3-37 (which I chair) was able to reduce the entire development time for a revision of S3.25 to just under 9 months in 2009. Not surprisingly, there was no single 'silver bullet', but instead a combination of efforts and established project management techniques newly brought to bear on the standards development process.
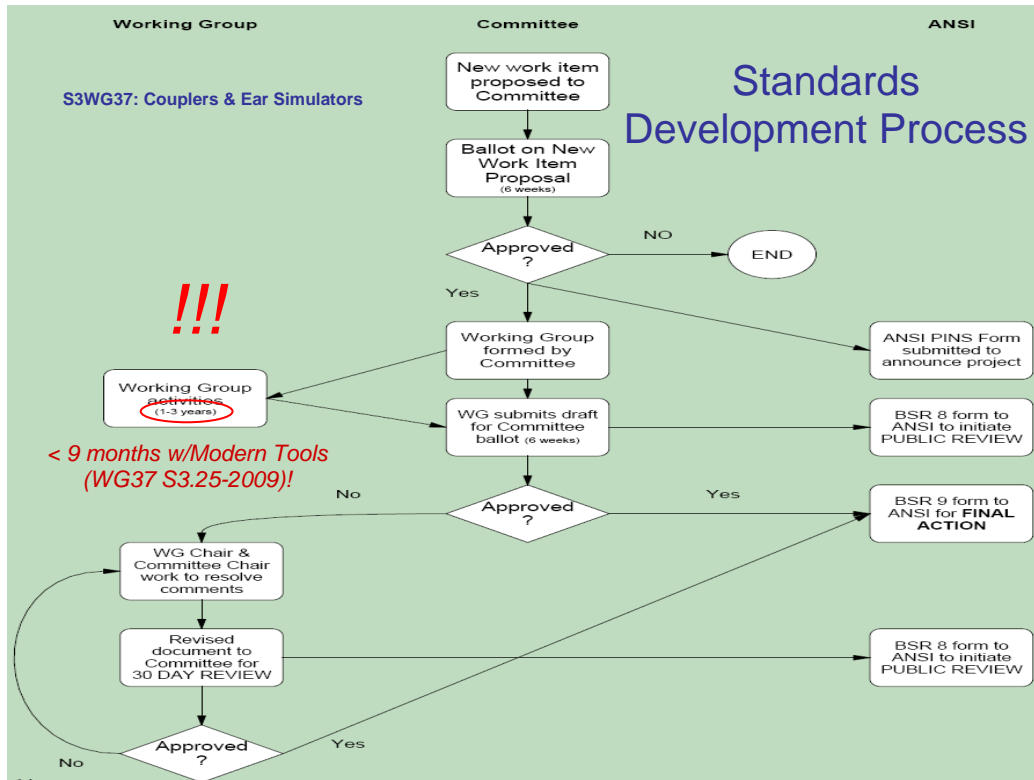
*Fig. 1. Time for working group to come to closure.*

WG37 began with quick consensus on a draft document outlining the scope of the document revision, e.g., what was to be updated and what was not. This turned out to be essential in order to engage discussion, debate and eventual consensus. We then followed up with monthly on-line 'Virtual Meetings' using WebEx and a conference call. We were aided by a resource provided by ASA, namely a password-protected web site for depositing documents, including drafts, contributions, meeting minutes, and reference materials. As Chair, I was responsible for maintaining this site and for timely posting of all documents. This eliminated blast spam emails with large attachments.

It was also advantageous that we stuck to a regular meeting schedule and protocol in order to keep everyone engaged. Another practice adopted by the working group was that at the end of each meeting, noted action items were assigned to individuals as 'homework' due for the next meeting. Although somewhat new, this was surprisingly not the least bit controversial. Last but not least, lots and lots of follow up, *follow up*, **follow up** by yours truly…

Progressive versions of the drafts also made intense use of the 'mark-up' tools within MS Word to track changes. Version control also enabled us to show cleaned up versions of new drafts (with the previous meeting's changes accepted) but also to go back and 'undo' if necessary. Another very effective tool was the use of 'balloon' comments for posing questions to the group (e.g. 'Should this clause be moved to an annex?'), responding to queries (e.g., "Why was this clause deleted?" "It wasn't. It was moved to Annex C."), and noting reminders to the group (e.g., "We need an updated reference for this…").

## Conclusion

To be fair, most of these methods and processes were not innovative nor invented here, but rather best practices observed to be effective for similar projects and adopted or re-purposed for our own devices. Nonetheless, even the best tools will not by themselves ensure dramatic time savings nor smooth operation if they are not properly leveraged. It also greatly aids communication if these processes are transparent (as much as possible) to everyone involved. Needless to say, these same techniques are currently in use in S3WG67 (Manikins), the other working group I chair.

In summary:
- Garner early consensus on the Revision Scope
- Engage the participants
- Have shorter (≤ 90 min), more frequent (monthly) on-line 'Virtual Meetings'
- Use Tools within MS Word, such as "Track Changes" and "Comment" balloons to engage discussion
- Leverage the ASA's file transfer protocol (ftp) site for posting drafts, reference material, and meeting minutes
- Post all documents in a timely manner!
- Don't be afraid to assign homework
- Keep good records
- Keep WG processes transparent

Christopher Struck is the CEO and Chief Scientist for CJS Labs, a consulting firm, in San Francisco. Mr. Struck was Electroacoustics Application Specialist at Brüel & Kjær – Denmark from 1986-1993. He was Principal Consultant for Charles M. Salter Associates from 1994-95. From 1996-2001, he was Manager of Electroacoustics in the Research Group at GN ReSound. He was Director of Engineering at Dolby Laboratories from 2001-05 and Vice President of Engineering for Tymphany Corporation in 2006. Mr. Struck holds a degree in Electrical Engineering from the University of Wisconsin – Madison, where his studies also included electronic music composition. Mr. Struck is the author of many technical papers, application notes and articles. During the course of his work, he has traveled extensively throughout the world, providing training and lecturing on the topics of acoustics, signal processing, and measurement techniques.

He is a Fellow and former Governor of the Audio Engineering Society (AES), a Member of the Acoustical Society of America (ASA), and a Senior Member of the Institute of Electrical and Electronics Engineers (IEEE). He is the Chair of the American National Standards Institute (ANSI) S3WG37 Working Group on Couplers and Ear Simulators and the Chair of the ANSI S3WG67 Working Group on Manikins. He is active on the AES SC-04-03 Working Group on Loudspeaker Modeling and Measurement, the AES SC-04-04 Working Group on Microphones, the ANSI S3WG48 Working Group on Hearing Aid Measurements, and the IEEE Subcommittee on Telephone Instrument Testing.