

Date: 2 May 2022
Memo to: Accredited Standards Committee (ASC) Z136
From: Ted Early, Secretary ASC Z136
Subject: Minutes of ANSI Accredited Standards Committee Z136 Annual Meeting
9 March 2022.

ADMINISTRATIVE

1. The meeting was held by videoconference using Zoom due to the COVID-19 pandemic.
2. The slides presented at the meeting are posted on the ASC Z136 web site, www.Z136.org, in the ASC Z136 – General section.
3. The following ASC Z136 committee members and observers *attended* the meeting:

Name	Representing	Voting Member	Observer
Aldrich, Robert	Individual Member	X	
Anibarro, Gus	Laser Institute	X	
Barat, Ken	SPIE	X	
Bernath, Robert	University of Central Florida		X
Bollich, Wolfgang	Arizona State University	X	
Bothner, David	NoIR Laser Shields	X	
Brumage, Chris	USAPHC		X
Buschow, Ritchie	Individual Member	X	
Caldero, Liliana	LIA/Secretariat		X
Carlisle, Adam	NAWCAD Vision Laboratory	X (alt)	
Casson, Joanna	Los Alamos Natl. Laboratory	X	
Chen, Hong	Beijing University of Technology		X
Chowdary, Ashan	Self		X
Clark, C.D.	Fort Hays University	X	
Cohen, Zohar	Standards Institute of Israel		X
Colbert, Abigail	Fortec Medical		X
Cueva, John	Gentex		X
Daniels, Steven	Eastern Illinois University		X
Daskalova, Rebecca	Ohio State University		X
Dennis, Evangeline	Wellstar Health System	X	
Early, Edward	SAIC	X	
Edwards, Ben	Individual Member	X	
Elliott, Zakary	FDA		X
Erb, Austin	Sentara Healthcare		X
Ertle, Bill	Rockwell Laser Industries	X	
Fales, Andrew	FDA	X	
Felinski, David	B11 Standards, Inc.		X

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Attachment 1: ASC Z136 Membership

Flores-McLaughlin, John	Individual Member	X	
Frederiksen, Annette	Robert Bosch GmbH		X
Frey, Kevin	Association of Surgical Technologists	X	
Galoff, Penelope	Individual Member	X	
Ghassemi, Pejman	FDA		X
Gibbons, William	Univ. of Chicago, Office of Res. Safety		X
Gillman, Christopher	Self		X
Gough, John	Swedish Medical Center		X
Greco, Joseph	Individual Member	X	
Green, Paul	Apple		X
Hadler, Joshua	NIST	X	
Haes, Donald	Individual Member	X	
Halama, Gary	Collins Aerospace		X
Harvey, Richard	Roswell Park Comp. Cancer Center		X
Hemperly, Stephen	American Industrial Hygiene Assoc.	X	
Henes, Yuliya	University of Wisconsin		X
Hunter, Jennifer	Individual Member	X	
Janssen, Bill	Self		X
Keita, Gabriel	Gentex		X
Kelly, Edward	Health Physics Society	X	
Kinerk, Wesley	AFRL Optical Rad. Bioeffects Branch		X
King, Jamie	Lawrence Livermore Natl. Laboratory	X	
Lanzafame, Raymond	NAALT	X	
Lau, Erwin	Exponent Inc.	X	
Leon, Niel	Johns Hopkins University	X	
Lieb, Thomas	Individual Member	X	
Lucci, Ben	Gentex		X
Lund, Brian	Individual Member	X	
Makasyuk, Igor	SLAC Natl. Accelerator Laboratory	X (alt)	
Marshall, Wes	Individual Member	X	
McGurk, Seth	ForTec Medical		X
McHatton, Roberta	Photon Manufacturing	X	
McKervey, Michael	Canon Product Development		X
Mercier, Annie	Laval University		X
Mordica, Christopher	Lakeview Medical		X
Murphy, Patrick	International Laser Display Association	X	
Neudecker, Teresa	Boeing		X
Owens, Patti	AORN	X	
Parkinson, Jay	Individual Member	X	
Paura, Randy	Dynamic Laser Solutions/Individual	X	
Payne, Dale	UNC Health		X
Potter, Elvet	Self		X
Purcell, Emily	AFRL Optical Rad. Bioeffects Branch		X
Quick, Nat	Laser Institute		X
Reed, Frank	Indian Hills Community College		X

Roche, Neil	Gentex		X
Rockwell, Ben	USAF Research Laboratory	X	
Rogers, Bret	Individual Member	X	
Sams-Contrata, Barbara	Self		X
Santucci, James	Fermi Natl. Acceleratory Laboratory		X
Schuster, Kurt	AFRL Optical Rad. Bioeffects Branch		X
Seaman, Dan	Northrop Grumman	X	
Seeber, Fred	Camden College	X	
Sheehy, James	NAVAIR	X	
Sliney, David	Individual Member	X	
Sparks, Shawn	USAPHC	X	
Spichiger, Gary	Georgia Institute of Technology		X
Stanley, Christine	NAWCAD Vision Laboratory	X	
Strzelecki, Woody	FDA		X
Stuck, Bruce	Individual Member	X	
Szekacs, Austin	Individual Member	X	
Terrenoire, Wendy	VHA		X
Thomas, Robert	USAF Research Laboratory	X (alt)	
Tipping, Tracy	Self		X
Tomczyk, Carol	Applied Lightwave Strategies, LLC		X
Toncheva, Greta	Lawrence Berkeley Natl. Laboratory	X	
Torrico, Raul	Self		X
Wengraitis, Stephen	USAPHC	X (alt)	
Woods, Michael	SLAC Natl. Accelerator Lab.	X	
Zettler, Joseph	George Brown College		X
Zimmerman, Sheldon	Naval Sea Systems Command	X	

4. The following *proxies* were received for voting purposes:

Committee Member	Representing/Organization	Named Proxy
Pfoutz, Jeff	Individual Member	Sheldon Zimmerman
Sprauge, Rebecca	ASLMS	Patricia Owens
Triventi, Antonio	Individual Member	Jamie King
Wheatley, Trevor	UNSW	Sheldon Zimmerman
Smalley, Penny	ICSP	Thomas Lieb

5. Fifty two (52) eligible votes were present in person or by proxy. This represents a quorum of the seventy five (75) eligible votes of the ASC Z136 Committee (for current committee roster see Attachment 1).

WELCOME

6. Sheldon Zimmerman, Chair of Accredited Standards Committee (ASC) Z136, called the meeting to order at 11:05 am EST/8:05 am PST, noted almost all of the registrants were

present, and apologized for any issues arising from his low-grade fever. There were no attendee introductions in the interest of time.

7. Sheldon Zimmerman is the Chair of ASC Z136, with representatives of the Secretariat (The Laser Institute – LIA) Liliana Caldero, Manager for Standards and Publications, and Nathaniel Quick, Executive Director.
8. Sheldon Zimmerman reminded attendees to check the official membership roster on the Z136.org website to confirm they are a member of the Main Committee, and reiterated that subcommittee members are not necessarily members of the Main Committee. He also stated only Main Committee members may vote during the meeting, although all attendees may ask questions and provide comments.
9. Sheldon Zimmerman continued with further points for conducting the meeting. Robert's Rules of Order apply. The "Raise Hand" feature of Zoom indicates an attendee wants the floor, the Chair recognizes them, and the host unmutes their microphone. For remarks, the speaker needs to state their name and affiliation for the minutes, and limit their remarks to ten minutes per question. Voting uses the Chat feature, so the Participants feature should display an attendee's full name. Right-clicking on a name permits editing. The host will pause the Chat feature immediately prior to voting, enter the issue on which a vote is taken, and then enable the Chat feature for voting. The voting options are Yes, No, and Abstain, and if a voter is holding a proxy for another Member, that proxy vote should be included in the individual's response. He emphasized the need to remain in the meeting to establish a quorum, with several short breaks scheduled throughout. If an attendee misses a ballot, they can submit their vote in writing within thirty days of the meeting. A summary of any votes taken during the meeting will be sent out following the meeting. Sheldon Zimmerman closed by noting the meeting is recorded, the presentation slides are contained in one file, and C.D. Clark III will share the slides on his screen and advance them using prompts from the presenter. If there is an interruption, Liliana Caldero will share her screen and advance the slides. He asked the presenters to be mindful of background noises and distractions.

APPROVALS

10. Liliana Caldero, Manager of the Standards and Publications Department at LIA, reviewed the officers appointed by the ASC Z136 Secretariat: Sheldon Zimmerman as Chair, C.D. Clark III as Vice-Chair, and Ted Early as Secretary. Per the Procedures, the positions of Chair and Vice-Chair are subject to ballot. They were balloted by the ASC Z136 on 8 March 2022, and both received 100% approval with 81% of the ballots returned. The upcoming term for the Administrative Committee (ADCOM), with all members returning, has Sheldon Zimmerman, C.D. Clark III, Ted Early, Robert Thomas, Liliana Caldero, Nathaniel Quick, Kevin Frey, Jamie King, Erwin Lau, Bret Rogers, and Mike Woods as members.
11. Sheldon Zimmerman briefly reviewed the structure of ASC Z136. The American National Standards Institute (ANSI) oversees and is the approving authority for standards generated by ASC Z136, and the Laser Institute (LIA) is the Secretariat. The ASC Z136 committee is the consensus body, with the ADCOM providing oversight. The bulk of the effort on standards is

provided by subcommittees and working groups. He emphasized this meeting is not a meeting of SSC-1, but rather the over-arching ASC Z136 main committee meeting. This point often causes confusion among first-time observers.

12. Sheldon Zimmerman reviewed the proposed agenda for the meeting, noting the times are expressed in Pacific Standard Time. C.D. Clark III made a *motion* to approve the meeting agenda, and Ray Lanzafame *seconded* the motion. Robert Aldrich asked about adding a topic to New Business, and Sheldon Zimmerman replied it could be added, if time permitted, at that point in the meeting. The motion *passed* unanimously using the Chat feature (47 Yes, 0 Abstain). The agenda is Attachment 2.
13. Sheldon Zimmerman reviewed the proxies received – himself for Jeff Pfoutz and Trevor Wheatley, Patricia Owens for Rebecca Sprauge, Jamie King for Antonio Triventi. Penny Smalley sent a message to Sheldon Zimmerman requesting Thomas Lieb take her proxy, and he accepted.
14. Sheldon Zimmerman noted the minutes for the 2021 ASC Z136 Annual Meeting were posted on the ASC Z136 website. There were no suggested changes to the meeting minutes. Ray Lanzafame made a *motion* to approve the minutes from the 29 May 2021 Annual Meeting of the ASC Z136. The motion was *seconded* by Thomas Lieb. The motion *passed* unanimously using the Chat feature (44 Yes, 2 Abstain). **ACTION: Ted Early to post the 2021 ASC Z136 Annual Meeting minutes on the ASC Z136 website.**

ADCOM REPORT

15. Sheldon Zimmerman presented the ADCOM report, which includes balloting results, interpretations and explanations, and membership.
16. The recommended appointments for the Standards Subcommittee (SSC) Chairs are as follows, with no changes from the previous year.
 - a. SSC-1, Safe Use of Lasers: Sheldon Zimmerman
 - b. SSC-2, Safe Use of OFCS Utilizing Laser Diode and LED Sources: David Sliney
 - c. SSC-3, Safe Use of Lasers In Health Care: Ray Lanzafame
 - d. SSC-4, Measurements and Instrumentation: Ted Early
 - e. SSC-5, Safe Use of Lasers in Educational Institutions; Randy Paura
 - f. SSC-6, Safe Use of Lasers Outdoors: Robert Aldrich
 - g. SSC-7, Eyewear and Protective Barriers: Chris Stanley
 - h. SSC-8, Safe Use of Lasers in Research, Development & Testing: Joanna Casson
 - i. SSC-9, Safe Use of Lasers in Manufacturing Environments: Tom Lieb
 - j. SSC-10, Safe Use of Lasers in Entertainment, Displays and Exhibitions: Jay Parkinson
17. The recommended appointments for the Technical Subcommittee (TSC) Chairs are as follows, with no changes from the previous year.
 - a. TSC-1, Bioeffects and Medical Surveillance: Brian Lund
 - b. TSC-2, Hazard Evaluation: Karl Umstadter
 - c. TSC-4, Control Measures, Training, and Laser Safety Programs: Mike Woods

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- d. TSC-5, Non-Beam Hazards: Ben Edwards
 - e. TSC-7, Analysis & Applications: Wes Marshall
18. The ballot for the SSC Chairs closed on 8 March 2022 with 81% returned and all Chairs approved. Approval rates ranged from 96% to 100%.
 19. The ballot for TSC Chairs closed on 8 March 2022 with 81% returned and all Chairs approved. Approval rates ranged from 97% to 100%.
 20. One membership ballot circulated in the previous year. Sufficient ballots were returned, and all membership changes were approved with rates from 74% to 100%. The ballot approved Arizona State University as an organizational member with Wolfgang Bollich as the primary representative; the International Society for Optics and Photonics (SPIE) as an organizational member with Ken Barat as the primary representative; Edward Kelly as the alternate representative of the US Air Force Surgeon General; Bret Rogers as an Individual Member; and Ritchie Buschow as an Individual Member.
 21. Consensus Body Balloting Groups for the Main Committee were established for the Committee Draft for Vote (CDV) of Z136.1 with 67 members; and for Subcommittees for the SCDV of Z136.10 with 29 members. Balloting closed on 11 June 2021 for SCDV2 of Z136.3; and on 11 November 2021 for CDV4 of Z136.1. All ballots passed with rates of 100% and 97%, respectively.
 22. There were no changes to the Procedures during the past year.
 23. There was one request for an Explanation during the past year, received on 27 July 2021. The request involved an apparent contradiction in Z136.1 regarding medical examinations. Section 6.1 states that medical examinations shall be performed as soon as practical when a suspected injury or adverse effect from a laser exposure occurs. However, Appendix F states that any employee with an actual or suspected laser-induced injury should be evaluated by a medical professional as soon as possible after the exposure. Sheldon Zimmerman replied Section 6.1 is normative while Appendix F is informative, and therefore the normative text with shall takes precedence.
 24. ASC Z136 currently has 75 eligible voting members (30 Individual and 45 Organizational), with good distribution across interest categories. Of the 82 total members, 7 have emeritus status. Of the 45 organizational members, 14 have alternate representatives. The Consultant and Professional Society interest categories have the most members. There were no inactive members over the past year.

SSC AND TSC STATUS REPORTS

25. Each of the SSC Chairs presented a brief update on the activities of their subcommittees. The slides presented are included in those posted on the ASC Z136 website.

- a. Sheldon Zimmerman presented the SSC-1 update. He started by stating Z136.1 should encompass the information required by 90% of the users of the standard, with the vertical standards dealing with special cases for a particular use. The subcommittee has many members, and no new members will be added until after publication of the revision. The subcommittee has liaisons with all other subcommittees. CDV1 was approved with 88% affirmative ballots, and CDV2 was approved with 93% affirmative ballots. CDV3 was closed due to a clerical error in the comment resolution matrix, corrected, and issued as CDV4, which was approved with 97% affirmative ballots in November 2021. The revised Z136.1 completed public review and is now at the EWG, with publication expected soon. This revision achieved some paring of content, but not enough to satisfy most of the subcommittee members. The next revision should accomplish the goal of a significant reduction removing those parts not applicable to 90% of the users. There are no current issues. The year ahead will have EWG review and publication, followed by celebration and a new Chair for SSC-1. Sheldon Zimmerman is retiring within two years, and a volunteer has agreed to become the next Chair SSC-1. Robert Aldrich thanked Sheldon Zimmerman for his continued diligence with Z136.1 despite the challenges of the pandemic and significant revisions to the standard.
- b. David Sliney presented the SSC-2 update. He started by adding to the accolades expressed by Robert Aldrich for Sheldon Zimmerman's service. The main objective of Z136.2 is quite different from the other standards, as it is devoted to the safe installation, maintenance, and service of lasers used in optical fiber and free space communication systems. These lasers are Class 1 or Class 1M for the most part. An objective of SSC-2, spanning several decades, is to harmonize with the IEC 60825 Part 2 and Part 12 manufacturer standards. However, the current problem with revising Z136.2 is that there is little interest in making changes. There have been extensive discussions with WG5 of IEC TC76, which covers the same area. While the scope is confined to the infrared wavelength region, most optical fiber systems work in the near-infrared, from 850 nm to 2 μ m. The standard is also limited to terrestrial applications, as airborne and space applications are covered by Z136.6. He contacted two experts in the field to join SSC-2, but both declined. The current version was published in December 2012, and minor changes are anticipated. Mike Regan, Chair of WG5, argued for inclusion of hazard and access levels, but there is not much support for this. David Sliney considers aligning an existing user standard to a manufacturer standard by using their terminology as overkill. Current issues are using the term "hazard level" when design engineers do not see a risk, confusion regarding classification with embedded lasers, fascination that manufacturers want to make classification overly complex, and frustration at the lack of interest from the optical fiber community in participating on SSC-2. One SSC-2 member argued for recertification, but ANSI does not permit this ten years after publication. David Sliney suggested avoiding a tedious editorial review, if the changes are minor, by considering only those sections with changes.
- c. Ray Lanzafame presented the SSC-3 update. The Z136.3 standard spans the entire healthcare environment. SSC-3 has 40 members and is not accepting new ones until the current revision is complete. A comprehensive list of activities since publication in 2018 concluded with the EWG review of SCDV2, returned on 14 February 2022 with a 100-

page summary comment form. The officers of SSC-3 are currently in the process of slogging through the comments, and all officers agreed to continue for another year. The next step is CDV1. The goal of SSC-3 is to improve upon the present standard and produce an interoperable standard that protects patients, operators, and personnel, and promotes safety.

- d. Ted Early presented the SSC-4 update. Z136.4 is unique in that it is a Recommended Practice rather than a Standard. No new members were added in the past year, and the SSC-4 meeting the next week is a recruiting opportunity for new members. The goals for the meeting are to complete the SPIR and Scope, and assign lead authors to proposed revisions. The newest version of Z136.4 was published in July 2021, and Ted Early thanked all those who helped with the revision and approval process. The schedule calls for two years to produce an SCDV, with another year to the CDV stage. Emerging topics have not changed, and previous suggestions by SSC-4 members and substantive changes recommended during the balloting process generated those topics.
- e. Randy Paura presented the SSC-5 update. The goal of Z136.5 is to be a practical and applied standard. Membership is stable and applicants undergo a vetting process. Randy Paura mentioned the possibility of using the Wassenaar Arrangement for additional structural guidance for activities. The revision process started with a questionnaire and feedback from educators, which generated an extensive list. Most of the proposed changes involve informative material, and review of the normative sections will ensure alignment with Z136.1. The next meeting is this month, and publication of the next revision is currently planned for 2025.
- f. Robert Aldrich presented the SSC-6 update. SSC-6 is open to new members through the SCDV development process, and had one virtual meeting in the past year and one in-person meeting of the officers. The past year was relatively uneventful, with notable changes still nominal ocular dazzle distances and laser control groups. The former topic incorporates the robust and mature model of McLin and Williamson for dazzle distances and provides information on visual interference and mitigation. The latter topic is a new method to pair control measures with hazards, with the challenge of defining thresholds that maintain simplicity. Some emerging topics will be deferred to the next revision. Of note is merging laser and system safety terminology to reduce confusion, incorporating new control measures in standards, and removing military-specific lasers. Activities for the next year should include a draft SCDV, in-person meetings, and setting thresholds for laser control groups.

Robert Aldrich proceeded to announce, with mixed emotions, his resignation as Chair of SSC-6. He gave his full support to Paul Sorensen as the next Chair. Paul Sorensen has been an officer of SSC-6 for many years and has broad expertise with both commercial and military lasers. Robert Aldrich offered to continue as Vice Chair of SSC-6, and thanked Liliana Caldero, Sheldon Zimmerman, and Wes Marshall for their support over the years. Robert Aldrich's reasons for resigning are three-fold. First, his activities as Chair of the Department of Defense Laser System Safety Working Group on Policy are time-consuming. Second, the revision of Z136.6 would benefit from someone with more system

safety experience. Third, in his opinion, the structure, procedures, and policies of Z136 are in significant need of revision, and he offered to assist with an effort to address that concern. He ended by stating it was his pleasure and honor to be Chair for many years, his support for the Z136 standards, and his respect for all members of Z136 in ensuring the safe use of all lasers.

Gary Halama of Collins Aerospace asked if the Z136 standards include the probability of exposure as a factor, and expressed appreciation for the inclusion of dazzle in Z136.6. Robert Aldrich replied the standards include allowances for exposure potential based on proximity and time. He went on to note the standards are deterministic in nature, but that probabilistic risk analysis is an emerging area of interest for laser safety. Gary Halma followed up with a question about working groups, to which Robert Aldrich encouraged him to apply for membership on SSC-6, as including all affected stakeholders is very helpful when developing standards.

- g. A short break followed.
- h. Chris Stanley presented the SSC-7 update. She noted laser protective equipment does not include that for high energy or power lasers, or clothing. Membership increased, including four from industry. A kick-off meeting on 6 October 2021 discussed updating the acronym list and abrasion description; adding fluorescence testing, hysteresis with photochromic effects with LEP, and prescription and LEP testing; and updating the barriers and labeling section. Since protective clothing is not in the Scope and there is sparse documentation, it will not be included in the next revision. The revision will not include high energy laser testing until Z136.1 has determined a definition for high energy. The revision will include a warning about ultraviolet degrading dyes used in LEP, and labeling based on, but not identical to, EN 207. Since most changes are minor, the effort should remain on schedule with SCDV1 scheduled for January 2023. There will be a second meeting in early May, and there are weekly officer meetings and periodic subgroup meetings.

Ben Edwards asked about harmonizing with EN 207 and Niel Leon requested harmonization with ANSI Z87.1. Chris Stanley replied SSC-7 would discuss these topics at their next meeting. David Bothner noted ISO 19818 is replacing EN 207 and has a different coding scheme. Chris Stanley asked about the time required to make the transition. Bill Ertle responded it takes some time for manufacturers to change from one standard to another, and there were legitimate reasons Z136.7 did not harmonize with EN 207. Josh Hadler noted both standards and manufacturers benefit from harmonization, and asked if newer technologies, such as dielectric reflective coatings and nanoparticle absorbers, are included in Z136.7. Chris Stanley replied they are. Mike Woods noted the target audience of Z136 standards are users rather than manufacturers, to which Chris Stanley responded Z136.7 is meant for everyone who uses LEP, and continued that LEP needs to be appropriate for the application and tested for abrasion, ballistics, or solarization if relevant to the application. David Sliney added Z136 has historically recommended intelligible markings on LEP, so it is important to explain the coding. He further noted test houses dominate the ISO committee on testing and labeling, and they are interested in maximizing testing, even if not warranted. Bill Ertle noted ISO 19818 is similar to a

manufacturer standard, whereas the upcoming 19818-1 is similar to a user standard. He further noted many LEP manufacturers reference Z136.7.

- i. Joanna Casson presented the SSC-8 update. SSC-8 has 51 members, with 15 new members recruited through e-mails and recommendations to the Chair. The PINS was approved in August 2021, the kick-off meeting was held in December 2021, and a survey distributed in January 2022 to members on new topics, additions to current topics, other concerns, and desired sections on which to work. A follow-up survey will ask for input on which sections to pare down. The top three emerging topics from the survey are white light continuum, recommended elements of a laser safety program, and microscope use with lasers. Activities for the next year are forming committees to work on sections, determine which sections to expand or condense, and begin the revisions.
 - j. Tom Lieb presented the SSC-9 update. The Secretary position is currently vacant, and there is no active recruiting since the SCD is nearing completion. The Z353 compliance guide and a written laser safety program template are being incorporated into the SCD. Highlighted changes are a revised Appendix B with industrial applications and examples, example templates and checklists for state agencies, and watermarking on example warning signs and labels. The initial SCDV ballot is scheduled for April 2022. The most notable current issues are aligning the definitions with those in Z136.1 and examples of hazard analyses. SSC-9 will avail themselves of the EWG checklist, emphasize informative appendices to make Z136.9 useful for industry, and use web meetings and cloud editing. The next year will have an SCDV, alignment with Z136.1, and feedback from state agencies. The SCD has an innovative style that will add value to the presentation of safety standards in the laser workplace.
 - k. Jay Parkinson presented the SSC-10 update. He is optimistic that SSC-10 is close to the first edition of Z136.10. The website accounts of several members expired due to inactivity, and Jay Parkinson intends to reactivate them. SCDV1 was circulated to the balloting group on 8 April 2021, with balloting closing on 10 May 2021. Balloting resulted in six negative votes and 92 pages of comments. Jay Parkinson, Casey Stack, and David Sliney worked through the comments and proposed alternatives. Activities for the coming year include finishing the responses to the comments, discussing responses to negative voters, distributing responses to the entire SSC-10 by 1 May 2022 followed by a virtual meeting, and preparing SCDV2 by 1 September 2022. Jay Parkinson expressed appreciation for David Sliney's assistance with the responses to the comments. Roberta McHatton looks forward to reviewing the responses.
26. Each of the TSC chairs presented a brief update on the activities of their subcommittees. The slides presented are included in those posted on the ASC Z136 website.
- a. Brian Lund presented the TSC-1 update. TSC-1 is responsible for reviewing new and emerging research in laser bioeffects and assessing if MPEs need adjustment. While medical surveillance is being de-emphasized, TSC-1 does try to provide guidance for unintended or accidental laser exposures. Several members were removed for inactivity, but TSC-1 remains large and diverse. Consultation is sought from experts conducting

research, and applicants are generally accepted if they demonstrate an interest in laser bioeffects and a willingness to participate. David Sliney and Wes Marshall identified significant errors in the ultraviolet ocular and skin MPE tables in CDV3 of Z136.1. TSC-1 held several working group meetings to review the errors and propose corrections, and these were presented at a full TSC-1 meeting on 19 October 2022. The members at the meeting accepted the corrections, and these were transmitted to the Chair of SSC-1. Other working group meetings reviewed new sub-ns data and interacted with Z80.36 on repetitive pulse exposures. While repetitive pulses have been under discussion for many years, there are still no definitive results on which to propose suggestions for changes to the MPEs. Anticipated data reviews for the coming year are for ultra-short pulses, particularly at visible wavelengths near 10 ps with possible suggestions for sub-ns MPEs, and corneal ED_{50s}. TSC-1 will also review concerns involving section 8.3 of Z136.1.

- b. Randy Paura presented the TSC-2 update in lieu of Karl Umstadter. Both the Vice Chair and Secretary positions are open, there are no new members, and there are liaisons with all other subcommittees. The past year was quiet, with no requests or current issues. The laser control groups proposed by SSC-6 are a possible area for future guidance. Randy Paura noted TSC-2 stands ready to assist with hazard evaluations.
- c. Michael Woods presented the TSC-4 update. The scope of TSC-4 differs between horizontal and vertical standards, in that it defines control measures, training, and laser safety programs for the former but advises on these for the latter. Membership is rather large, with approximately 60 including two new members. Michael Woods ensures TSC-4 is listed on SPIRs as a coordinating TSC when appropriate. TSC-4 will coordinate on upcoming SCDVs of Z136.5, Z136.6, and Z136.7, and submitted comments on SCDVs of Z136.3 and Z136.10, and on the definition of an interlock for SSC-6. A virtual meeting on 9 June 2021 had 25 participants and discussed a wide range of topics. Jamie King leads a task group on controls for high power or energy lasers, and other control topics were software interfaces and interlocks. Ken Barat leads a task group on training methods, and this group completed an example appendix and posted it to the TSC-4 website. Unresolved comments on SCDV of Z136.3 will need to be resolved at the CDV stage. Coordination with SSC-1 for the next revision of Z136.1 should include the appropriate scope of TSC-4 and resolution of deferred comments. The next meeting is planned for May, with activities for the next year to include review of SCDV1 of Z136.6, resolution of SCDV1 comments on Z136.10, review of SCDV1 of Z136.9, coordination with SSC-1, and continuing task group work on controls.
- d. Ben Edwards presented the TSC-5 update. The definition of a non-beam hazard continues to be a hazard associated with a laser system but not resulting from direct exposure of tissue to the laser beam. Membership increased by one, with two new and one retiring, and the Secretary position is vacant. A virtual meeting on 12 April 2021 covered a variety of topics, including a succession plan for the Chair, who is close to reaching the 15-year maximum for a subcommittee officer. TSC-5 continues to monitor emerging non-beam hazards and determine if existing hazards need more emphasis. The idea of Class 5 for very high power lasers continues to elicit discussions, with a small group having legitimate concerns, but there is little support from Z136 since the beam control measures are the

same as those for Class 4. Approaching Class 5 from a non-beam hazard perspective may be fruitful since such lasers may have unique hazards, and the next meeting will discuss this. Activities for the next year will include a virtual meeting in April or May, and developing a succession plan for the next Chair. Ben Edwards concluded by stressing non-beam hazards can be lethal, and the goal of TSC-5 is to provide guidance that is concise, practical, and technically supportable without trying to squeeze an entire occupational health and safety text into Z136 standards. Jamie King noted many groups are interested in the concept of Class 5 lasers, and he is preparing a presentation on this topic for ILSC.

- e. Wesley Marshall presented the TSC-7 update. While TSC-7 is not creating new examples, it is available to review any new ones, and membership is stable. Objections to the UV limits in CDV2 of Z136.1 on 1 June 2021 were incorrectly incorporated in CDV3, resulting in revision and CDV4. TSC-7 is currently reviewing CDV4 of Z136.1 for technical errors, concurrently with the EWG review, and will send comments to the EWG for inclusion in their form. TSC-7 continues to review standards for technical content to ensure consistency between standards.
27. Kevin Frey presented the EWG update. The Secretary position is vacant, and Kevin Frey singled out the Quintet Crew members for special mention. These five – Ben Edwards, Bill Janssen, Tom Johnson, Jeff Pfoutz, and Carol Tomczyk – have completed every review since Kevin Frey became Chair. The EWG is open to new members who enjoy editing. Kevin Frey reminded subcommittees to designate a liaison when a document is being reviewed. Changes to the EWG checklist are complete and should be posted soon, and Kevin Frey strongly encouraged standards subcommittees to use the checklist prior to submission to the EWG. He also strongly encouraged alignment of definitions and abbreviations with those in Z136.1. While 2021 was relatively quiet, with only a review of Z136.3, 2022 promises to pick up the pace with reviews of Z136.1, Z136.2, Z136.9, and Z136.10. Kevin Frey ended by noting the current review of Z136.1 is looking good.

OLD BUSINESS

28. New Z136 Website – Liliana Caldero reported the new Z136 website recently launched, and an e-mail informed users with instructions for logging into the new site, including resetting their password. The website team at LIA is currently sifting through expired accounts and receiving feedback and fixing bugs as they appear to ensure a smooth user experience. Liliana Caldero will re-send log-in instructions so all users can migrate to the new site, and eventually the old website will re-direct to the new one.
29. The lunch break followed for approximately forty-five minutes.

NEW BUSINESS

30. Accredited Standards Developer Designation – Liliana Caldero briefly reviewed correct ANSI terminology. The term “Accredited Standards Committee” (ASC) was used in the past, but has been replaced by “Accredited Standards Developer” (ASD). Furthermore, while LIA and ASC Z136 previously had joint accreditation, now LIA is the sole legal entity responsible for

standards and a member of ANSI, so is the ASD. An ASD is equivalent to a Standards Developing Organization (SDO). Using the designation ASC Z136 is still allowable, but Z136 is neither accredited nor an ANSI committee. Several questions further clarified the terminology. ANSI is concerned with following procedures and approving standards based on following those procedures. While ANSI developed technical content at its founding, it no longer does so. There is now a separation between development and approval. The logo at the lower right of standards covers is “Approved American National Standard,” and the designation at the upper right is “ANSI Z136.x – 20yy.” Once approved, a standard can be referenced by this designation.

31. Proposed Z136 Convention Revisions – Michael Woods began by stating the proposed revisions target resolving ballot comments and other ballot process items. They provide new guidance on reference documents for SCDV and CDV ballots and definitions of substantive change and objection; sample comment forms; and a new section on addressing and resolving ballot comments. Documents to provide at each balloting stage include redlined versions of the draft and comment forms, including resolutions, from prior ballots. For terminology, from ANSI, a substantive change is one that directly and materially affects the use of a standard. An objection is either a comment from a CBBG member who submitted a negative-vote ballot which needs to be resolved to change their vote, or a comment from a TSC member proposing a substantive change. This terminology is included in the example summary comment forms. For addressing and resolving ballot comments, the SSC officers receive the ballot results and comment matrix. They review all comments and accept proposed changes they deem appropriate, with documentation in the comment matrix. They also make an effort to resolve objections by communicating with the member who cast the negative-vote ballot to find a resolution acceptable to the officers and member. If no resolution is forthcoming, the officers should enlist assistance from other CBBG, SSC, or TSC members, or other experts, to find an acceptable resolution. If this effort also fails, the reasons for and against the proposed change are documented in the comment matrix.

Ben Rockwell asked if comments from previous ballots are posted on the website, to which Michael Woods and Liliana Caldero replied it depends on the SSC Chair. Patrick Murphy asked that the definition of substantive change be added to the TSC summary comment form. Ray Lanzafame was unsure of the intent of the proposed changes, as SSC-3 is already following the procedure for resolving ballot comments. He also noted a related problem is a member of both the SCDV and CDV balloting groups raising the same objection at each level. Michael Woods responded the intent was to replace the unclear meaning of a critical comment with the term objection, which is used elsewhere in the Conventions and Procedures, and to link an objection to a negative-vote ballot. Ted Early added this exercise will modify his approach to balloting, using objections on negative-vote ballots for those changes deemed necessary. Ben Rockwell, based on his recent experience with Z136.1, noted addressing each objection individually takes time, and Ray Lanzafame agreed with this concern.

32. Proposed Formatting of Z136 Standards – Kevin Frey began the presentation with some background. Patrick Murphy approached the EWG in June 2021 with a proposal to implement a uniform format for standards, and this was discussed within the ADCOM and with Liliana Caldero. A straw poll sent out in October 2021 collected results in November 2021. The

current formatting is a challenge due to a lack of differentiation in the hierarchy of subclauses, resulting in a blending of text. Also, the running header in the appendices does not indicate the appendix designation or topic. The proposal is to limit subclauses to five levels, add indentation to subclause headings, add color to level 1 and 2 headings, and add more detail to the running header of appendices. This can also work with a single color for headings. Benefits include providing consistency for all standards, preventing excessive subclause levels such as 4.4.2.3.2.13.2, improving the clarity of subclause levels, and modernizing for the PDF era. The straw poll had 39 responses, and of those 33 to 34 were in favor of the proposed changes to formatting. The choice of color should “pop out” at the reader, but it should also be judicious and consider color blindness. Options besides color are capitalization and underlining. The straw poll responses indicated a concern that SSCs will be responsible for style as well as content. Kevin Frey remarked formatting is relatively easy in Word and someone other than the SSC can implement this. Patrick Murphy added the straw poll with proposed changes received 84 % approval, and the suggested changes are not final.

Comments and questions were generally in favor of the proposal, with a few modifications. Ray Lanzafame remarked on the wisdom of a consistent template, and requested a standard list of definitions and abbreviations in all documents, with an understanding that definitions will vary by user. Ken Barat noted many organizations are considerate of colorblindness so are removing color as a differentiator, for example using symbols rather than color in plots. Patrick Murphy responded that the single color for headings is not for differentiation, which indentation accomplishes. Randy Paura suggested using ISO and IEC Word templates as a reference. Robert Aldrich added indentation can be less extreme than in the example, and Kevin Frey reiterated the proposed changes are still subject to modification. Robert Aldrich also added most comments he receives on the standards deal with the clarity of the text, not with the style. Jennifer Hunter noted most colorblindness is dichromatic, so those with that condition can still differentiate most colors. Kevin Frey and Patrick Murphy plan to generate an example document. Fred Seeber thought the proposed changes would be of great benefit for Z136.5. Wes Marshall noted the change in page format from two- to one-column now allows indentation, and it should probably be more minor than in the example. Also, a previous objection to indentation increasing page count is no longer relevant. Patrick Murphy remarked Z136 cannot consider page count of the document when deciding on style and content.

33. Motion to Review Procedures – Robert Aldrich made the following *motion* in the Chat feature: “As a duly-elected ASC voting member, I would like to move to establish an independent writing group, which is a sub group in accordance with our Procedures, Section 6, to review the current Procedures and to create a revised draft update to the Procedures for review by the ADCOM in accordance with Section 4.b and for possible ratification for vote by the committee.” Ken Barat *seconded* the motion, opening up discussion. Robert Aldrich noted acceptance of a writing group requires public notice, it is not a subcommittee so all the attendant formalities are not required, and it can be disbanded by a vote. He offered his services, as he had previous experience with the Procedures when the Executive Committee was abandoned in favor of the current structure of Z136, and this motion was one of his reasons for resigning as Chair of SSC-6.

Patrick Murphy asked Robert Aldrich if he had anything specific in mind with a review of the Procedures, and Robert Aldrich indicated he did not. Rather, he would be looking for such things as circular arguments, how to deal with objections on affirmative ballots, organizational structure, and anything to make the Procedures more defensible and credible. He also noted the officers, membership, and frequency of meetings of a subcommittee are at the discretion of its Chair. The writing group has no independent authority, as any proposals would have to be approved by the ADCOM and then the full Z136 committee. Liliana Caldero noted the Procedures have to follow the ANSI Essential Requirements, and be approved by ANSI. Michael Woods remarked the Procedures and Conventions go together, and Robert Aldrich responded their content and interaction would be part of the review. Perhaps the Procedures could incorporate parts of the Conventions, or vice versa. Robert Aldrich also noted the writing group would reduce the workload on the ADCOM to review and propose changes to the Procedures. He views this motion as providing an opportunity to the ADCOM for an independent review of the Procedures, thereby reducing their workload.

Since the motion was not on the Z136 Annual Meeting agenda, no vote was possible. Instead, the ADCOM should send out a ballot on approving a writing group to review the Procedures and suggest changes to the ADCOM. Robert Aldrich and the ADCOM should meet to agree on the wording, and thereby the scope, of the ballot for the proposed writing group. **ACTION: Robert Aldrich to supply Liliana Caldero a text version of his motion to establish a writing group to review the Procedures.**

NEXT MEETING

34. Sheldon Zimmerman announced the next ASC Z136 Annual Meeting is scheduled for Sunday, 26 February 2023 in Portland, Oregon preceding ILSC. He hoped the meeting will be in-person.
35. Sheldon Zimmerman thanked everyone for attending. Tom Lieb made a *motion* to adjourn. Randy Paura *seconded* the motion. The motion *passed* unanimously. The 2022 ASC Z136 Annual Meeting adjourned at 4:02 pm EST/1:02 pm PST.
36. Action Items from the meeting:
 - a. **ACTION: Ted Early to post the 2021 ASC Z136 Annual Meeting minutes on the ASC Z136 website.**
 - b. **ACTION: Robert Aldrich to supply Liliana Caldero a text version of his motion to establish a writing group to review the Procedures.**

Respectfully submitted,
Ted Early, Secretary ASC Z136

Attachments:

1. Accredited Standards Committee Z136 Membership
2. Agenda for the 9 March 2022 ASC Z136 Annual Meeting

ASC Z136 Annual Meeting Minutes, 25 May 2021
Attachment 1: ASC Z136 Membership

ASC Z136 Membership

Mr. Robert Aldrich
8209 Eden Dr.
King George, VA 22485
Tel: 540.653.1149
robertcaldrich@gmail.com
Type: Individual Member
Rep: Self
Interest: Department of Defense

Dr. Macrene Alexiades
955 Park Avenue
New York, NY 10028
dralexiades@nyderm.org
Type: Alternate Organizational Representative
Rep: ASLMS
Interest: Professional Society

Mr. Gus Anibarro
1921 Gaston Foster Rd.
Orlando, FL 32812
Tel: 321-961-8151
g_anibarro@hotmail.com
Type: Organizational Representative
Rep: Laser Institute of America
Interest: Consumer Organization

Ms. Jacqueline Ansa
13501 Ingenuity Dr.
STE 128
Orlando, FL 32826
Tel: 407-380-1553
jansa@lia.org
Type: Organizational Representative
Rep: Secretariat
Interest: Professional Society

Prof. Prem Batra
Type: **Member Emeritus**
Rep: Self
Interest: Academia

Dr. Scott Benjamin
PO Box 27
Sidney, NY 13838
Tel: 607-563-3927
SBenjamin@DentalAIM.com
Type: Organizational Representative
Rep: Academy of Laser Dentistry
Interest: Professional Society

Dr. Michael Berlin
8733 Beverly Blvd
Suite 301
Los Angeles, CA 90048
Tel: (310) 855-1112
berlin@ucla.edu
Type: Individual Member
Rep: American Glaucoma Society
Interest: Health Care

Mr. Wolfgang Bollich
304 E. 24th Street, Ste. 202
Mail Code: C2600
Austin, TX 78712
Tel: 512-232-1654
wolfgang.bollich@austin.utexas.edu
Type: Alternate Organizational Representative
Rep: The University of Texas at Austin
Interest: Academia

Mr. David Bothner
6155 Pontiac Trail
South Lyon, MI 48178
Tel: 734-769-5565
david.bothner@noirlaser.com
Type: Organizational Representative
Rep: NoIR LaserShields
Interest: Manufacturer

Mr. William Burgess
PO Box 191117
Little Rock, AR 72219
Tel: 501-407-0712
wmb699@gmail.com
Type: Organizational Representative
Rep: Power Technology Inc.
Interest: Manufacturer

Ms. Liliana Caldero
13501 Ingenuity Dr.
STE 128
Orlando, FL 32826
Tel: 407-985-3810
lcaldero@lia.org
Rep: Secretariat
Interest: Professional Society

ASC Z136 Annual Meeting Minutes, 9 March 2022
Attachment 1: ASC Z136 Membership

Mr. Adam Carlisle
48110 Shaw Rd.
Bldg 2187 Rm 1A50
Patuxent River, MD 20670
Tel: (301) 342-8698
adam.carlisle1@navy.mil
Type: **Alternate Organizational Representative**
Rep: Vision Lab, NAWCAD
Interest: Department of Defense

Joanna Casson
PO Box 1663
MS J567
Los Alamos, NM 87545
Tel: 505-665-6186
casson@lanl.gov
Type: Organizational Representative
Rep: Los Alamos National Laboratory
Interest: Government Contractor

Dr. C.D. Clark III
601 Park St
Hays, KS 67601
Tel: 785-628-4502
cdclark@fhsu.edu
Type: Organizational Representative
Rep: Fort Hays University
Interest: Academia

Dr. Michael D. Colvard, DDS, PhD
College of Dentistry
801 South Paulina
Chicago, IL 60612
Tel: 847-421-2442
colvard@uic.edu
Type: Organizational Representative
Rep: Univ of Illinois, Chicago, School of
Dentistry
Interest: Academia

Richard Crowson
5260 Watermill Ln #301
Titusville, FL 32780
Tel: 2053128991
richardcrowson1@me.com
Type: Individual Member
Rep: Jacobs Technical/ Kennedy Space Center
Interest: Government Contractor

Mr. Paul Daniel, Jr.
4380 Lawnwood Lane
Burton, MI 48529-1931
Tel: 810-814-0977
daniellasersafety@yahoo.com
Type: Organizational Representative
Rep: Daniel Laser Safety
Interest: Consultant

Mr. Paul Denney
285 West Street
Northborough, MA 01532
Tel: 860-466-0523
pedenney1@hotmail.com
Type: Organizational Representative
Rep: American Welding Society
Interest: Professional Society

Mr. Jerry Dennis
438 Russell Avenue
Gaithersburg, MD 20877-2865
Tel: (301) 216-5057
jerodeni2@comcast.net
Type: Individual Member
Rep: Self
Interest: Consultant

Ms. Vangie Dennis
3899 St. Elisabeth Sq
Duluth, GA 30096
Tel: 404-805-1487
atlvang@aol.com
Type: Organizational Representative
Rep: Wellstar Health System
Interest: Health Care

Mr. David Dewey
Johnson and Johnson Vision
510 Cottonwood Dr.
Milpitas, CA 95035
Tel: 408-792-8190
ddewey1@its.jnj.com
Type: Individual Member
Rep: Self
Interest: Manufacturer

Dr. Edward Early
4141 Petroleum Rd
Fort Sam Houston, TX 78234
Tel: 210-539-8250
edward.early.ctr@us.af.mil
Type: Organizational Representative
Rep: SAIC, (formerly Engility, formerly TASC
Inc.)
Interest: Government Contractor

Ben Edwards
1302 Willow Dr.
Chapel Hill, NC 27517
Tel: 919/357-6985
benedwards888@gmail.com
Type: Individual Member
Rep: Self
Interest: Industrial/Commerce

ASC Z136 Annual Meeting Minutes, 9 March 2022

Attachment 1: ASC Z136 Membership

Mr. William Ertle
PO Box 43010
7754 Camargo Road
Cincinnati, OH 45243
Tel: 513.271.1568
billertle@rli.com
Type: Organizational Representative
Rep: Rockwell Laser Industries
Interest: Consultant

Mr. Robert Fairchild
1 Cyclotron Road, MS 75R0123
Berkeley, CA 94720
Tel: 510-495-2278
rffairchild@lbl.gov
Type: **Alternate Organizational Representative**
Rep: Lawrence Berkeley National Laboratory
Interest: Government Contractor

Dr. Andrew Fales
10903 New Hampshire Ave
WO66 Rm2646
Silver Spring, MD 20993
andrew.fales@fda.hhs.gov
Type: Organizational Representative
Rep: Center for Devices and Radiological Health
Interest: Regulatory Agency

Mr. Mark Festenstein
421 14th Avenue West
Kirkland, WA 98033
Tel: 425-250-4095
uvlights457@gmail.com
Type: Individual Member
Rep: Self
Interest: Manufacturer

Dr. John Flores-McLaughlin
PO BOX 198
Redmond, WA 98073, WA 98052
Tel: 281 244 1521
john_fm@icloud.com
Type: Individual Member
Rep: Self
Interest: Manufacturer

Ms. Wanda Folsom
3645 Desert Ridge Place
Castle Rock, CO 80108
Tel: 940-595-2076
Wanda.Folsom@ast.org
Type: **Alternate Organizational Representative**
Rep: Association of Surgical Technologists
Interest: Professional Society

Mr. Kevin Frey
6 West Dry Creek Circle
Littleton, CO 80120
Tel: 800-637-7433, 2515
kfrey@ast.org
Type: Organizational Representative
Rep: Association of Surgical Technologists
Interest: Professional Society

Ms. Penelope Galoff
53 Trent Road
Elkton, MD 21921
Tel: 410-436-5058
pkgaloff@gmail.com
Type: Individual Member
Rep: Self
Interest: Consultant

Kurt Geber
Kennedy Space Center
Mailcode: Si-E10
Kennedy Space Center, FL 32955
Tel: 321-867-4795
kurt.r.geber@nasa.gov
Type: **Alternate Organizational Representative**
Rep: NASA
Interest: Government (Non-DoD)

Joseph Greco
1290 Blossom Drive
Victor, NY 14564
Tel: (585) 924-0350
joeg@upstatemp.com
Type: Individual Member
Rep: Self
Interest: Consultant

Joshua Hadler
325 Broadway
Mail Stop 815.01
Boulder, CO 80305
Tel: 303-497-4451
joshua.hadler@nist.gov
Type: Organizational Representative
Rep: NIST
Interest: Government (Non-DoD)

Donald Haes
PO Box 198
Hampstead, NH 03841
Tel: 6176806262
donaldhaes@comcast.net
Type: Individual Member
Rep: Self
Interest: Government Contractor

ASC Z136 Annual Meeting Minutes, 9 March 2022
Attachment 1: ASC Z136 Membership

Mr. Robert Handren, Jr.
Type: **Member Emeritus**
Rep: Self
Interest: Consultant

Mr. Winn Henderson
12 Laboratory Drive
Research Triangle Park, NC 27709
Tel: 919-549-1324
winn.henderson@ul.com
Type: Organizational Representative
Rep: UL
Interest: Testing Laboratory/Facility

Mr. Tim Hitchcock
Type: **Member Emeritus**
Rep: Self
Interest: Consultant

Mr. John Hoopman
5323 Harry Hines Blvd.
Dallas, TX 75390-8533
Tel: 214-648-2416
John.Hoopman@UTSouthwestern.edu
Type: Organizational Representative
Rep: University of Texas Southwestern Medical
Interest: Health Care

Dr. Jennifer Hunter
Box 314
601 Elmwood Ave.
Rochester, NY 14642
Tel: 585-273-4848
jhunter@ur.rochester.edu
Type: Individual Member
Rep: Self
Interest: Academia

Edward Kelly
14407 Circle A Trail
Helotes, TX 78023
Tel: 210 539 8205
kelly.ed@ieee.org
Type: Organizational Representative
Rep: Health Physics Society
Interest: Professional Society

Dr. Ami Kestenbaum
162 Einstein Way
Cranbury, NJ 08512
Tel: 609-448-7711
akestenbaum@yahoo.com
Type: Individual Member
Rep: Self
Interest: Consultant

Mr. Jamie King
7000 East Avenue
L-454
Livermore, CA 94551
Tel: 925-423-3077
king75@llnl.gov
Type: Organizational Representative
Rep: LLNL
Interest: Government Contractor

Dr. Dan Kuespert
3400 N Charles Street
Wyman WG40
Baltimore, MD 21218
dkuespert@jhu.edu
Type: Alternate Organizational Representative
Rep: Johns Hopkins University
Interest: Academia

Dr. Andrew Lambert
School of Eng & IT Tech/Space Eng
UNSW Canberra
Canberra ACT 2600 Australia, ACT 2600
a.lambert@adfa.edu.au
Type: **Alternate Organizational Representative**
Rep: UNSW Canberra
Interest: Academia

Dr. Raymond Lanzafame
757 Titus Avenue
Rochester, NY 14617-3930
Tel: 585.266.2150
raymond.lanzafame@gmail.com
Type: Organizational Representative
Rep: NAALT - North American Association for
Photobiomodulation Therapy
Interest: Health Care

Dr. Erwin Lau
149 Commonwealth Dr.
Menlo Park, Calif 94025
Tel: 6506887073
eklau@exponent.com
Type: Organizational Representative
Rep: Exponent Inc.
Interest: Consultant

Mr. Nathaniel Leon
3400 N Charles Street
Wyman WG40
Baltimore, MD 21218
Tel: 4105166752
nleon1@jhu.edu
Type: Organizational Representative
Rep: Johns Hopkins University, WSE
Interest: Academia

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Mr. Thomas Lieb
8864 Mannington Street
San Jose, CA 95758
Tel: 916 691 1646
Laserjox@aol.com
Type: Organizational Representative
Rep: L*A*I International
Interest: Industrial/Commerce

Dr. Jeffrey Lodwick
8660 S Sandy Parkway
Sandy, UT
Tel: 801.233.4913
Lodwick.Jeffrey@dol.gov
Type: Organizational Representative
Rep: OSHA
Interest: Regulatory Agency

Dr. Brian Lund
4141 Petroleum Drive
JBSA Fort Sam Houston, TX 78234
blund@satx.rr.com
Type: Individual Member
Rep: USAISR
Interest: Government Contractor

Mr. David Lund
4 inwood Point
San Antonio, TX 78248
Tel: 210.601-9357
jacklund@satx.rr.com
Type: Individual Member
Rep: Self
Interest: Consultant

Prof. Martin Mainster
Dept. Ophthalmology, U Kansas School of
Medicine
7400 State Line Road
Prairie Village, KS 66208-3444
Tel: 913-588-6605
martin.mainster@att.net
Type: Individual Member
Rep: Self
Interest: Academia

Dr. Igor Makasyuk
2575 Sand Hill Rd
Menlo Park, CA 94025
Tel: (650) 926-3248
igorm106@slac.stanford.edu
Type: Alternate Organizational Representative
Rep: SLAC National Accelerator Laboratory
Interest: Academia

Mr. Wesley Marshall
Laser Safety Specialties
34 Marsh Woods Lane
Wilmington, DE 19810-3958
Tel: 302-743-2058
wesmarshall_2000@yahoo.com
Type: Individual Member
Rep: Self
Interest: Consultant

Ms. Roberta McHatton
27012 47th PL S
E206
Kent, WA 98032
Tel: 4257535644
roberta@lasersafetyservices.com
Type: Organizational Representative
Rep: Photon Manufacturing
Interest: Manufacturer

Mr. Patrick Murphy
7062 Edgeworth Drive
Orlando, FL 32819
Tel: 4077977654
mail@laserist.org
Type: Organizational Representative
Rep: Int'l Laser Display Assn. (ILDA)
Interest: Trade Association

Ms. Patti Owens
75301 Montecito Drive
Indian Wells, CA 92210
Tel: 360-280-0269
patti.owens.laser@gmail.com
Type: Organizational Representative
Rep: Association of periOperative Registered
Nurses (AORN)
Interest: Professional Society

Mr. Daniel Palmerton
62 Tobago Ln
St Augustine, FL 32092
Tel: 716-391-0714
danpalmerton@outlook.com
Type: Individual Member
Rep: Self
Interest: Health Care

Jay Parkinson
333 N. Pennington Dr.
Unit 67
Chandler, AZ 85224
Tel: 480 813-1904
jay@lasersafetyconsultant.com
Type: Individual Member
Rep: Self
Interest: Consultant

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Mr. Randolph Paura
2261 Thompson Road
Fort Erie, On L2A 5M4
Tel: 9059949009
rp.eng@xplornet.ca
Type: Individual Member
Rep: Dynamic Laser Solutions Inc.
Interest: Industrial/Commerce

Mr. Jeffrey Pfoutz
265 Midway Park Drive
Saint Augustine, FL 32084
Tel: (410) 436-5066
jrpfoutz@gmail.com
Type: Individual Member
Rep: Self
Interest: Directly Affected Public

Dr. Angel Plaza
Office of the Chief Health and Medical Officer
Mail Code QA000
Washington, DC 20546
Tel: 281-483-7305
angel.l.plaza@nasa.gov
Type: Organizational Representative
Rep: NASA
Interest: Government (Non-DoD)

Mr. Steven Ramiza
445 Godwin Ave., Ste. 9
Midland Park, NJ 07432
Tel: 201-447-6400
steven.ramiza@lanassociates.com
Type: **Alternate Organizational Representative**
Rep: ASSP
Interest: Professional Society

Dr. Ben Rockwell
AFRL 711 HPW/RHDO
4141 Petroleum Drive
JBSA Fort Sam Houston, TX 78234-2644
Tel: 210-539-8160
benjamin.rockwell@us.af.mil
Type: Organizational Representative
Rep: USAF Research Laboratory
Interest: Department of Defense

Mr. Bret Rogers
2977 Hobson Way
Wright-Patterson AFB, OH 45433
Tel: 937-656-7268
bretrogers@gmail.com
Type: **Alternate Organizational Representative**
Rep: U.S Surgeon General's Office
Interest: Department of Defense

Mr. Dan Seaman
One Space Park
R1/1096
Redondo Beach, CA 90277
Tel: 310-812-5247
daniel.seaman@ngc.com
Type: Individual Member
Rep: Self
Interest: Government Contractor

Dr. Fred Seeber
4 Beatrice Dr.
Manahawkin, NJ 08050
Tel: 609 978 8187
fredpseeber@comcast.net
Type: Organizational Representative
Rep: Camden College, NJ
Interest: Academia

Dr. James Sheehy
Bldg 2187 Suite 1286
48110 Shaw Rd
Patuxent River, MD 20670
Tel: 301-342-8144
james.sheehy@navy.mil
Type: Organizational Representative
Rep: NAVAIR
Interest: Department of Defense

Dr. David Sliney
406 Streamside Drive
Fallston, MD 21047-2806
Tel: 410-877-1646
David.Sliney@att.net
Type: Individual Member
Rep: Self
Interest: Consumer/Consumer Organization

Mrs. Penny Smalley
808 Brantwood Ave.
Elk Grove Village, IL 60007
Tel: 8479798654
pennyjs@aol.com
Type: Organizational Representative
Rep: International Council on Surgical Plume
Interest: Professional Society

Mr. Shawn Sparks
8965 Schaefer Rd
ATTN: MCHB-PH-NIR
APG, MD 21010-5403
Tel: 410.436.5056
lasers@ssparks.com
Type: Organizational Representative
Rep: USAHPC
Interest: Department of Defense

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Ms. Rebecca Sprague
3835 J St
Sacramento, Ca 95819
Tel: 916-456-0400
clinic@skinlasers.com
Type: Organizational Representative
Rep: ASLMS
Interest: Professional Society

Ms. Christine Stanley
48110 Shaw rd Unit #5
bldg 2187 Lab 1A50
Patuxent River, MD 20670
Tel: (301) 342-8476
christine.stanley@navy.mil
Type: Organizational Representative
Rep: Vision Lab, NAWCAD
Interest: Department of Defense

Mr. Bruce Stuck
23106 Osprey Ridge
San Antonio, TX 78260-2779
Tel: 210-316-2099
bstuck@satx.rr.com
Type: Individual Member
Rep: Self
Interest: Consultant

Dr. Kenneth Sullins
Midwestern University College of Veterinary
Medicine
19555 N 59th Ave
Glendale, AZ 85308
Tel: 571-246-3122
sullins@vt.edu
Type: Organizational Representative
Rep: American Veterinary Medical Assoc.
Interest: Professional Society

Mr. Austin Szekacs
2510 5th Street, Bldg. 840
Wright-Patterson AFB, OH 45433
austin.szekacs@us.af.mil
Type: Individual Member
Rep: USAF Surgeon General
Interest: Department of Defense

Mr. Paul Testagrossa
66 - 68th Street
Brooklyn, NY 11220
ptestagrossa@ieee.org
Type: Individual Member
Rep: Self
Interest: Consultant

Dr. Robert Thomas
14026 Gingerwood
San Antonio, TX 78231
Tel: 210.479.2057
robert.j.thomas@gmail.com
Type: **Alternate Organizational Representative**
Rep: USAF Research Laboratory
Interest: Department of Defense

Mrs. Greta Toncheva
One Cyclotron Rd
Stop mail 75R0123
Berkeley, CA 94720
Tel: 510-495-2544
gitoncheva@lbl.gov
Type: Organizational Representative
Rep: Lawrence Berkeley National Lab
Interest: Government Contractor

Mr. Antonio Triventi
1160 South Michigan Avenue
Unit 2605
Chicago, IL 60605
Tel: 312-427-3729
antoniotriventi@att.net
Type: Individual Member
Rep: Self
Interest: Academia

Dr. Karl Umstadter
17075 Thornmint Drive
CSD-6, 3400-135
San Diego, CA 92127
Tel: 619-322-3023
karl.umstadter@asml.com
Type: Individual Member
Rep: Self
Interest: Industrial/Commerce

Mr. William Vogt
WO62-RM1132
10903 New Hampshire Avenue
Silver Spring, MD 20993
Tel: 240-402-4142
william.vogt@fda.hhs.gov
Type: **Alternate Organizational Representative**
Rep: Center for Devices and Radiological
Health
Interest: Regulatory Agency

Stephen Wengraitis
MCHB-PH-NIR
Bldg E1950
APG, MD 21010
Tel: 410-436-5051
stephen.p.wengraitis.civ@mail.mil
Type: **Alternate Organizational Representative**
Rep: USAHPC
Interest: Department of Defense

Dr. Trevor Wheatley
PO Box 6152
Conder ACT 2906, Australia, ACT 2906
Tel: 61 2 6268 8162
t.wheatley@adfa.edu.au
Type: Organizational Representative
Rep: UNSW Canberra
Interest: Academia

Mr. Myron Wolbarsht
Type: **Member Emeritus**
Rep: Self
Interest: Academia

Dr. Michael Woods
2575 Sand Hill Rd.
M/S 48
Menlo Park, CA 94025
Tel: 650-926-3609
mwoods@slac.stanford.edu
Type: Organizational Representative
Rep: SLAC National Accelerator Laboratory
Interest: Government Contractor

Mr. Sheldon Zimmerman
Naval Surface Warfare Center
6078 Norc Avenue Suite 309
Dahlgren, VA 22448-5131
Tel: 540-653-1060
sheldon.zimmerman@navy.mil
Type: Organizational Representative
Rep: Naval Sea Systems Command
Interest: Department of Defense

Mr. Tony Zmorenski
2003 Kinder Ct.
Orlando, FL 32837
Tel: 407 240-4295
Tony.zmorenski@disney.com
Type: Individual Member
Rep: Self
Interest: Directly Affected Public



ASC Z136 MEETING AGENDA

Tuesday, March 9, 2022, 8:00 am PST
Via Zoom Web Conference

8:00 am	Call to Order	Sheldon Zimmerman
8:05 am	Welcome	Liliana Caldero
	<ul style="list-style-type: none">• Appointment of Secretary*• Ballot Results – ASC Chair* and Vice-Chair*	
8:10 am	Approval of Agenda Approval of Previous Minutes	Sheldon Zimmerman
8:15 am	ADCOM Report	Sheldon Zimmerman
	<ul style="list-style-type: none">• Ballot Results – Appointments of Subcommittee Chairs*• Ballot Results – Membership• Inactive Members Recommendations• Results of Balloting for Previous Year• Review of Interpretations for Previous Year, Pending Interpretations	
8:45 am	SSC & TSC Status Reports	Sheldon Zimmerman
	<ul style="list-style-type: none">• Z136.1 Revision	Sheldon Zimmerman
9:00 am	Break (15 minutes)	
9:15 am	SSC & TSC Status Reports	
	<ul style="list-style-type: none">• Z136.2 Revision• Z136.3 Revision• Z136.4 Revision• Z136.5 Revision• Z136.6 Revision• Z136.7 Revision• Z136.8 Revision• Z136.9 Revision• Z136.10	David Sliney Ray Lanzafame Ted Early Randy Paura Robert Aldrich Chris Stanley Joanna Casson Tom Lieb Jay Parkinson

**Term begins at the adjournment of the Annual Meeting*

11:00 am	Break <i>One-hour (return promptly at 12 pm PST/ 3 pm EST)</i>	
12:00 pm	Status Reports Cont'd <ul style="list-style-type: none">• TSC-1, Bioeffects• TSC-2, Hazard Evaluation• TSC-4, Control Measures, Training, & Laser Safety Programs• TSC-5, Non-Beam Hazards• TSC-7, Analysis & Applications• Editorial Working Group	Brian Lund Karl Umstadter Mike Woods Ben Edwards Wes Marshall Kevin Frey
1:00 pm	Old Business <ul style="list-style-type: none">• New Z136 Website	Sheldon Zimmerman Liliana Caldero
2:00 pm	New Business <ul style="list-style-type: none">• Accredited Standards Developer Designation• Proposed Z136 Convention Revisions• Proposed Formatting of Z136 Standards	Liliana Caldero Michael Woods Kevin Frey, Patrick Murphy
2:20 pm	Next Meeting <ul style="list-style-type: none">• ILSC 2023	Sheldon Zimmerman
2:30 pm	Adjourn	Sheldon Zimmerman