

**Minutes**  
**Control Protocols Working Group**  
Thursday, 20 October 2016  
Embassy Suites  
3600 Paradise Road  
Las Vegas, NV 89169

**Presiding chairperson:**

Maya Nigrosh; Electronic Theatre Controls, Inc.; A; MP

**Recording secretaries:**

Karl Ruling and Erin Grabe; ESTA

**Members in attendance:**

Daniel W. Antonuk; Electronic Theatre Controls, Inc.; P; MP  
Paul Beasley; Walt Disney Imagineering; Walt Disney Company; O; U  
Scott M. Blair; Full Throttle Films/ VER; P; DR  
Javid D. Butler; Integrated Theatre, Inc.; O; CP  
Ian Campbell; Doug Fleenor Design, Inc.; A; MP  
Steve Carlson; High Speed Design, Inc.; O; MP  
Jon Chuchla; Audio Visual Systems, Inc.; O; G  
Edward R. Condit; OSRAM Lighting Solutions; OSRAM Licht AG; O; G  
Hamish Dumbreck; JESE Ltd.; James Embedded Systems Engineering; O; MP  
Bill Ellis; Candela Controls, Inc.; P; DE  
Andrew Frazer; Stellascapes.com; P; MP  
Robert Goddard; Goddard Design Co.; P; MP  
Bill Hewlett; ImageCue LLC; O; MP  
Julian Hoare; Tait Towers; Tait Towers Manufacturing LLC; A; MP  
Jon Hole; Zero 88; Eaton; P; MP  
Maurits van der Hoorn; Pathway Connectivity; Acuity Brands Inc.; A; MP  
Michael Karlsson; LumenRadio AB; P; MP  
Paul M. Kleissler; City Theatrical; P; MP  
Ulrich Kunkel; E3 Engineering & Education for Entertainment GmbH; P; U  
Roger Lattin; I.A.T.S.E. Local 728; P; U  
Michael Lay; Philips Color Kinetics; Philips Lighting; P; MP  
Dan Lisowski; Dept. Of Theatre and Drama; University of Wisconsin - Madison; P; DE  
Kevin Loewen; Pathway Connectivity; Acuity Brands Inc.; P; MP  
Daniel Murfin; Royal National Theatre; P; U  
Simon Newton; Open Lighting Project; P; G  
Yngve Sandboe; Sand Network Systems, Inc.; O; MP  
Larry Schoeneman; DesignLab Chicago, Inc.; P; DR  
Tracy Underhill; Triple C Lighting & Controls; O; G  
Peter Willis; Howard Eaton Lighting Ltd.; P; CP  
Adam De Witt; Adept Anomaly; I; U

**Visitors:**

Frank Allison; McLaren Engineering Group  
George Zimmerman; CME Consulting, Inc.

## **1 Opening remarks**

Maya Nigrosh called the meeting to order at 9:05 a.m. She thanked everyone for attending and welcomed all, including past working group leaders. She then offered brief tips on WebEx etiquette to the group.

## **2 Attendance**

### **2.1 Introductions of those physically present and circulation of attendance sheet**

A yellow sign-in sheet was passed counterclockwise while self-introductions went clockwise around the room.

### **2.2 Introductions of those present via WebEx**

Erin Grabe read through the names of those present online.

### **2.3 Determination of a quorum**

By a count of voters' raised hands, Maya Nigrosh declared a quorum present.

### **2.4 Recognition of alternate voting members**

Ian Campbell was recognized as a voting Alternate.

## **3 Membership**

### **3.1 Requirements for membership, *new***

The following statement was read aloud to the assembly by Maya Nigrosh:

Membership is open to all who are affected by the work of the group. People and companies that would be in any interest category other than a manufacturer interest category are, at this time, particularly encouraged to apply for membership. There is an annual \$100 participation fee for all members. Voting members are required to attend meetings and to vote on letter ballots. Voting members and their alternates may not miss three consecutive meetings without a loss of voting status.

### **3.2 Changes to observer status due to lack of attendance**

There were no voters changed to Observer status due to lack of attendance.

### **3.3 Processing of new membership requests and changes in membership status:**

*As of 20 October 2016, the following new applications or requests for status change were received:*

Jeong Sik Yoo; Korea Testing Laboratory; Korea Testing Laboratory / Theatre Safety Center; P; DE  
Rich Dionne; Purdue University; I; DE  
Jim Love; Tait Towers; Tait Towers Manufacturing LLC; P; MP  
Julian Hoare; Tait Towers; Tait Towers Manufacturing LLC; A; MP  
Tracy Underhill, O to I

Roger Lattin moved to approve the applications. Discussion followed, and the group decided that those applicants with no representatives present should be accepted as Observers. Scott Blair then moved to approve the applications, with Jeong Sik Yoo and Rich Dionne as Observers. The motion was seconded and approved by a show of hands.

### **3.4 Consensus body**

The full consensus body of this group at the time of this meeting, including those not present, was:

Name	Representing	Voting status	Interest category
Kevin Loewen	Acuity Brands Inc.	P	MP
Robert Bell	Acuity Brands Inc.	A	MP
Gary Douglas	Acuity Brands Inc.	A	MP
Maurits van der Hoorn	Acuity Brands Inc.	A	MP
Adam De Witt	Adept Anomaly	I	U
Bill Ellis	Candela Controls, Inc.	P	DE
Brent Boulnois	Candela Controls, Inc.	A	DE
Jim Ohrberg	Candela Controls, Inc.	A	DE
Jason Potterf	Cisco	P	MP
Paul Kleissler	City Theatrical, Inc.	P	MP
Larry Schoeneman	DesignLab Chicago, Inc.	P	DR
Milton Davis	Doug Fleenor Design, Inc.	P	MP
Ian Campbell	Doug Fleenor Design, Inc.	A	MP
Ulrich Kunkel	E3 Engineering & Education for Entertainment GmbH	P	U
Jon Hole	Eaton	P	MP
Daniel W. Antonuk	Electronic Theatre Controls, Inc.	P	MP
Steve Terry	Electronic Theatre Controls, Inc.	A	MP
Maya Nigrosh	Electronic Theatre Controls, Inc.	A	MP
Edward A. (Ted) Paget	Electronic Theatre Controls, Inc.	A	MP
Scott M. Blair	Full Throttle Films/ VER	P	DR
Jeremy Hochman	Full Throttle Films/ VER	A	DR
Claude Ostyn	Full Throttle Films/ VER	A	DR
Robert Goddard	Goddard Design Co.	P	MP
Peter Willis	Howard Eaton Lighting Ltd.	P	CP
Edwin S. Kramer	I.A.T.S.E. Local 1	P	U
John Huntington	I.A.T.S.E. Local 1	A	U
Roger Lattin	I.A.T.S.E. Local 728	P	U
Alan M. Rowe	I.A.T.S.E. Local 728	A	U
Ken Vannice	Ken Vannice LLC	I	G
Tyrone Mellon_Jr.	Lex TM3	P	CP
Joshua Liposky	Lex TM3	A	CP
Michael Karlsson	LumenRadio AB	P	MP

Name	Representing	Voting status	Interest category
Marcus Bengtsson	LumenRadio AB	A	MP
Simon Newton	Open Lighting Project	P	G
Michael Lay	Philips Lighting	P	MP
Daniel Murfin	Royal National Theatre	P	U
Kimberly Corbett Oates	Schuler Shook	P	DE
Andrew Frazer	Stellascapes.com	P	MP
Jim Love	Tait Towers Manufacturing LLC	P	MP
Julian Hoare	Tait Towers Manufacturing LLC	A	MP
Darryl Ross	TMB	P	MP
Dan Lisowski	University of Wisconsin - Madison	P	DE
Dane Styczynski	University of Wisconsin - Madison	A	DE
Mitch Hefter	USITT	P	U
<b>Voting Status Key: P = Principal voter, A = Alternate voter, I = Individual voter</b>			
<b>Votes by Interest Category:</b>			
Custom-market producer		CP	2
Designer		DE	3
Dealer or rental company		DR	2
General interest		G	2
Mass-market producer		MP	12
User		U	6
<b>Total votes possible:</b>			27

#### 4 Approval of the minutes from the previous meeting

See *CPmin07-2016.pdf*

Maya Nigrosh noted that the group should check their contact information at the end of the minutes. Scott Blair then moved to approve the minutes of the July meeting as drafted. The motion was seconded and approved by a show of hands with two abstentions.

#### 5 Reading of the call for patents

The following statement was read aloud to the assembly by Maya Nigrosh:

ESTA intends not to publish any standard that contains protected intellectual property, unless that information can be licensed by anyone for a reasonable fee. ESTA uses a process of open patent and copyright disclosures to implement its intent. ESTA does not conduct patent or copyright searches and does not warrant that its standards contain no protected intellectual property.

In keeping with the open disclosures policy, I ask if anyone present wishes to notify this working group of the existence of a patent, patent application, copyright, or other intellectual property that might protect material in a standard being developed by this working group. You need not be the holder of the patent or copyright to notify this working group of its existence.

Nothing was disclosed.

## **6 Reading of the anti-trust statement**

The following statement was read aloud to the assembly by Maya Nigrosh:

ESTA and its members take seriously their obligation to comply with all applicable antitrust laws. Therefore, during this meeting and during all ESTA events, all discussions will be limited to those subjects that are permitted by the antitrust laws. All members should refrain from any discussion or mention of competitively sensitive subjects such as the current or future prices charged for any member product or services, current or future marketing plans or strategies, and current or future costs, including employee salaries. There also must be no agreement on the suppliers or customers that members will do business with or the markets in which members will conduct business.

Violations of the antitrust laws can have serious consequences. If you have any questions or concerns about anything that is discussed at a ESTA meeting, please bring your concern to ESTA management. An easy to read pamphlet describing the antitrust laws is available from the ESTA staff.

Karl Ruling and Erin Grabe held up copies of the pamphlet. Nothing was disclosed.

## **7 Approval of agenda**

Kevin Loewen moved to approve the agenda as drafted. The motion was seconded and approved with a show of hands in the room and online.

## **8 Old business**

### **8.1 Standards, Guides & Recommended Practice Maintenance**

*This is a placeholder in the agenda, so we don't forget to maintain them. Documents prefaced with an asterisk (\*) are on the agenda elsewhere for reports or action.*

ANSI E1.3 – 2001 (R2016), Entertainment Technology - Lighting Control Systems - 0 to 10V Analog Control Specification & Application Guide For ANSI E1.3 – 2004 Lighting Control Systems 0 to 10V Analog Control Specifications. (Revision, reaffirmation or withdrawal by 2021)

ANSI E1.11 – 2008 (R2013), Entertainment Technology - USITT DMX512-A, Asynchronous Serial Digital Data Transmission Standard for Controlling Lighting Equipment and Accessories. (Revision, reaffirmation, or withdrawal by 2018)

ANSI E1.17 – 2015 Entertainment Technology - Architecture for Control Networks (ACN) (Revision, reaffirmation, or withdrawal by 2020)

\* ANSI E1.20 - 2010, Remote Device Management over USITT DMX512. (Revision, reaffirmation or withdrawal by 2016)

ANSI E1.27-1 – 2006 (R2016), Entertainment Technology - Standard for Portable Control Cables for Use with USITT DMX512/1990 and E1.11 (DMX512-A) Products. (Revision, reaffirmation or withdrawal by 2021)

ANSI E1.27-2 – 2009 (R2014), Entertainment Technology - Recommended Practice for Permanently Installed Control Cables for Use with ANSI E1.11 (DMX512-A) and USITT DMX512/1990 Products. (Revision, reaffirmation, or withdrawal by 2019)

ANSI E1.30-1 – 2010 (R2016), EPI 23, Device Identification Subdevice. (Revision, reaffirmation or withdrawal by 2021)

ANSI E1.30-3 – 2009 (R2014), EPI 25, Time Reference in ACN Systems Using SNTP and NTP. (Revision, reaffirmation, or withdrawal by 2019)

ANSI E1.30-4 – 2010, EPI 26, Device Description Language (DDL) Extensions for DMX512 and E1.31 Devices. (Revision, reaffirmation, or withdrawal by 2020)

ANSI E1.30-10 – 2009 (R2014), EPI 32, Identification of Draft Device Description Language Modules. (Revision, reaffirmation, or withdrawal by 2019)

\* ANSI E1.31 - 2016, Lightweight streaming protocol for transport of DMX512 using ACN (Revision, reaffirmation, or withdrawal by 2021)

ANSI E1.37-1 - 2012, Additional Message Sets for ANSI E1.20, Remote Device Management. (Revision, reaffirmation, or withdrawal by 2017)

ANSI E1.37-2 - 2015, Additional Message Sets for ANSI E1.20 (RDM) – Part 2, IPv4 & DNS Configuration Messages. (Revision, reaffirmation, or withdrawal by 2020)

Application Guide for ANSI E1.3 - 2001, Lighting Control Systems 0 to 10V Analog Control Specification

Recommended Practice for Ethernet Cabling Systems in Entertainment Lighting Applications

Supplement to the Recommended Practice for Ethernet Cabling in Entertainment Lighting Applications

#### Withdrawn standards

E1.45 - 2013 (W2015), Unidirectional Transport of IEEE 802 data frames over ANSI E1.11 (DMX512A)

E1.30-7 - 2009 (W2016), EPI 29, Allocation of Internet Protocol Version 4 Addresses to ACN Hosts

### **8.2 ANSI E1.20 - 2010, Remote Device Management over USITT DMX512**

Simon Newton said that there was a task group meeting this Sunday, at 14:00 at the Embassy Suites.

### **8.3 BSR E1.30-11, EPI 33, Transport of root PDUs over TCP**

Maya Nigrosh asked Simon Newton if we need to still hold on this project. Simon Newton asked if there was any harm in continuing to hold, to which Maya replied that other standards may want to use this protocol, such as ACN. Scott Blair argued for waiting.

Dan Antonuk supported Scott Blair's argument. He asked Simon Newton for a copy of the most recent draft.

There was some discussion on whether or not there was a problem in waiting to publish this so long after its last public review. Karl Ruling advised that it would need to be offered for another public review before it is submitted for final ANSI approval. The consensus was to offer it for public review with BSR E1.33.

#### **8.4 ANSI E1.31 – 2016, Entertainment Technology—Lightweight streaming protocol for transport of DMX512 using ACN** (revise, reaffirm, or withdrawal by 11 October 2021)

Erin Grabe noted that it's published. So now we need to submit a PINS for revision, as voted upon at the last meeting. Maya Nigrosh said that the task group is meeting at the ESTA booth today.

#### **8.5 BSR E1.33, Transport of ANSI E1.20 (RDM) in an E1.31 environment**

Scott Blair said that the task group has been working on this document, but that they are hampered by lack of participation in task group WebEx meetings. Dan Antonuk said that setting a regular weekly meeting has helped with attendance, and he gave an optimistic report that the document should be ready for another public review soon. He said he hoped it would be the last public review before publication.

There was further discussion of how quickly the approximately 100 comments can be addressed. Offering it for public review in January is a goal, although people also felt that it was an ambitious deadline.

#### **8.6 BSR E1.37-4, Firmware updates via ANSI E1.20, RDM**

Peter Willis said that the task group had a small, productive meeting in July, but that there has not been much progress since then. A task group meeting planned for January in conjunction with the Plugfest would be helpful, Peter Willis said.

#### **8.7 BSR E1.37-5, General Purpose Messages for ANSI E1.20 RDM**

Simon Newton reported that the task group is meeting on Sunday for this project, as well as 1.37-6. The consensus was that this Sunday meeting will be a marathon effort, covering multiple projects.

#### **8.8 BSR E1.37-6 - 20xx, Additional Message Sets for ANSI E1.20 (RDM) - Parameter Description Messages**

*See item 8.7 of the agenda.*

#### **8.9 BSR E1.37-7 - 20xx, Additional Message Sets for ANSI E1.20 (RDM) - Gateway and Splitter Configuration**

*See E1.37-7 Gateway PIDs 2016-10-04a.pdf.*

Scott Blair reported on how the document was developed. There was discussion of including all or part of E1.33 as a reference with this document during public review, because it is referenced.

Scott Blair moved that we offer E1.37-7 to public review, with an executive summary of the E1.33 references in it. He will circulate the executive summary to the task group to make sure he has done the summary accurately. The motion was seconded. The motion carried with Yes votes, save one opposed.

#### **8.10 E1.37-x, Additional Message Sets for ANSI E1.20, LED walls and video displays**

No news, said Scott Blair.

#### **8.11 BSR E1.59 - 201x, Automation Vector Transmission Protocol**

Dan Lisowski reported on better attendance at the most recent task group meeting. They are looking at using an ACN framework for transmitting this data.

Dan Lisowski asked for a reflector for the task group. Erin Grabe asked for a list of who should be on it.

## 8.12 IPv6 task group report

*Documents in order of priority for IPv6 consideration:*

- E1-31-2009 -Entertainment Technology –Lightweight streaming protocol for transport of DMX512 using ACN
- E1.17 -Entertainment Technology -Architecture for Control Networks (ACN)  
Elements of E1.17 depended on by E1.31 must be addressed as a high priority
- E1.37-2-2015 Entertainment Technology –Additional Message Sets for ANSI E1.20 (RDM) –Part 2, IPv4 & DNS Configuration Messages

## 8.13 European Plugfest

Peter Willis reported that the European Plugfest will run 26-28 April 2017 with the same format and location as the 2016 event. See <http://www.plasa.org/rdm/> for more information

## 8.14 Texas Plugfest

*The January Plugfest dates are confirmed for 20-23 January 2017 at the D/FW Marriott Solana in Westlake, TX. See [estalink.us/plugfest](http://estalink.us/plugfest) for more information.*

Michael Lay praised Milton Davis's article about the Plugfest published in the latest issue of *Protocol*.

There was discussion of having more ACN equipment for the Plugfest. Maya Nigrosh said that she is willing to provide equipment and support for ACN.

## 8.15 AUS Plugfest

Andrew Frazer reported on the wide-spread adoption of our standards by amateurs who use them for Christmas displays. They tend to be casual with standards compliance.

Peter Willis asked for notice of the next AS Plugfest to be sent to the working group to spread the word.

## 8.16 Task group leader coordination

There were one addition to the list. Scott Blair was made the official scheduling liaison between the CPWG task groups and Frances Thompson. Anyone needed a physical task group meeting at an upcoming event should contact Scott.

*BSR E1.30 No single leader; Generic group  
BSR E1.31 Maya Nigrosh  
BSR E1.37-4 Peter Willis  
BSR E1.20 Simon Newton  
BSR E1.33 Dan Antonuk and Scott Blair  
BSR E1.30-11, EPI 33 Simon Newton  
BSR E1.37-2 Simon Newton  
BSR E1.37-5 Simon Newton  
BSR E1.37-6 Simon Newton  
BSR E1.37-7 Scott Blair  
BSR E1.59 Dan Lisowski and Maya Nigrosh  
E1.37-x Video Walls Scott Blair  
IPv6 Task Group Jason Potterf  
Plugfest Task Group Michael Lay  
Task Group Liaison, Scott Blair*



## 9 New business

### 9.1 TSP funding

Karl Ruling spoke to the group regarding the TSP budget. The TSP is actively seeking five-year commitments for contributions of \$1,000, \$2,500, \$5,000, \$10,000, or more, from companies of any size. Contributing companies will be added to the Investors in Innovation list. Without continued donations from the Investors in Innovation, the TSP will cease to exist, and with it all of the published ANSI standards will no longer be American National Standards. See *FundraisingScript.pdf* for information to use in helping us connect with someone in your company that can be approached for a contribution.

Hamish Dumbreck wants a better scope to the Investors in Innovation.

### 9.2 Last-minute application

Javid Butler; Integrated Theatre; O; G.

Roger Lattin moved to approve the application. The motion was seconded and approved by a show of hands in the room and on WebEx.

## 10 Other business & announcements

### 10.1 Above & Beyond Awards

Maya Nigrosh noted that the Above and Beyond Award nomination form, as well as a list of past recipients, is available at <http://estalink.us/aboveandbeyond>.

### 10.2 ESTA DMX512/RDM Educational Kit - "Train the Trainer" Session

Bill Ellis reported on work on a presentation to accompany the kit. In 30 days, he should be able to send the presentation to the CPWG for comments.

### 10.3 TSP sessions and ESTA at LDI 2016

Maya Nigrosh noted there were no CPWG sessions, but that information on ESTA at LDI 2016 is available at <http://esta.org/events/ldi2016.html>.

### 10.4 USITT sessions

Dan Lisowski said that members should put together session proposals for USITT 2018, which are submitted for consideration at USITT 2017. Session proposals may be submitted to Dan Lisowski directly, or may be brought to the January meetings.

### 10.5 NEC 2017 code changes affecting IEEE Clause 33, PoE

*Steven B. Carlson, Chair of IEEE P802.3bp 1000BASE-T1 PHY Task Force, and Dr. George Zimmerman to present to the working group regarding changes to clause 840.160 in NFPA 70-2017 that affect Power over Ethernet.*

An update on IEEE 802.3 Activities from Steve Carlson, High Speed Design, who is working with Robert Bosch GmbH, was given to the group. Steve Carlson touched on the following IEEE projects:

802.3 bp-2016

802.3bq--2016

P802.3bu (expected end of 2016)

P802.3bt-expected 2018

P802.3bv- end of 2016 early 2017. Plastic optical fiber.  
802.3bw-2015  
802.3bz-2016  
P802.3cg

George Zimmerman spoke on the NFPA changes to the NEC that affect PoE, including requirements to label ports with a maximum current and voltage per port, but noted the impracticality of doing so with little room on a 48-port switch.

See *ESTA\_802\_3\_update\_101116R2.pdf*, *NFPA\_Update\_20Oct2016.pdf*, and *NFPA\_70\_CommPowerClauses.pdf*.

### **11 Future meetings**

Maya Nigrosh noted that the January meeting dates have been confirmed for 19-22 January 2017, at the D/FW Marriott Solana in Westlake, TX. The ESTA Control Protocols Plugfest will run from 20-23 January.

### **12 Adjournment**

Kevin Loewen moved to adjourn. The motion was seconded. Hearing no objections, Maya Nigrosh declared the meeting adjourned at 11:59 a.m. PT.

Name	Company	Representing	Voting status	Int cat
Daniel W. Antonuk	Electronic Theatre Controls, Inc.	Electronic Theatre Controls, Inc.	P	MP
Matthew Ardine	IATSE Local 728	IATSE Local 728	O	U
Robert Barbagallo	Solotech Inc.	Solotech Inc.	O	U
Paul Beasley	Walt Disney Imagineering	Walt Disney Company	O	U
Robert Bell	Acuity Brands Lighting	Acuity Brands Inc.	A	MP
Marcus Bengtsson	LumenRadio AB	LumenRadio AB	A	MP
Scott M. Blair	Full Throttle Films/ VER	Full Throttle Films/ VER	P	DR
Lee J. Bloch	Bloch Design Group, Inc.	Bloch Design Group, Inc.	O	G
Brent Boulnois	Candela Controls, Inc.	Candela Controls, Inc.	A	DE
Javid D. Butler	Integrated Theatre, Inc.	Integrated Theatre, Inc.	O	CP
Justyn Butler	JBOTS	JBOTS	O	CP
Ian Campbell	Doug Fleenor Design, Inc.	Doug Fleenor Design, Inc.	A	MP
Jean-Francois Canuel	Spectrum Manufacturing Inc.	A.C. Lighting Ltd.	O	CP
Steve Carlson	High Speed Design, Inc.	High Speed Design, Inc.	O	MP
Jon Chuchla	Audio Visual Systems, Inc.	Audio Visual Systems, Inc.	O	G
Edward R. Condit	OSRAM Lighting Solutions	OSRAM Licht AG	O	G
Milton Davis	Doug Fleenor Design, Inc.	Doug Fleenor Design, Inc.	P	MP
Jeremy Day	Lumenpulse Lighting Inc.	Lumenpulse Lighting Inc.	O	MP
Larry Dew	W.A. Benjamin Electric Co.	W.A. Benjamin Electric Co.	O	DE
Rich Dionne	Dept. of Theatre	Purdue University	O	DE
Gary Douglas	Pathway Connectivity	Acuity Brands Inc.	A	MP
Tucker Downs	Tucker Downs	Tucker Downs	O	U
Hamish Dumbreck	JESE Ltd.	James Embedded Systems Engineering	O	MP
James Eade	ABTT	ABTT	O	G
Bill Ellis	Candela Controls, Inc.	Candela Controls, Inc.	P	DE
Paul K. Ericson	Sparling	Stantec	O	DE
Trevor Forrest	Helvar Lighting Control	Helvar Lighting Control	O	MP
Andrew Frazer	Stellascapes.com	Stellascapes.com	P	MP
Philip Gartner	AusChristmasLighting	AusChristmasLighting	O	U
Robert Goddard	Goddard Design Co.	Goddard Design Co.	P	MP
Jerry Gorrell	Theatre Safety Programs	Theatre Safety Programs	O	G

Name	Company	Representing	Voting status	Int cat
Erin Grabe	ESTA	ESTA	exf	G
Sean Harding	Port Lighting Systems	Port Lighting Systems	O	G
Mitch Hefter	Mitch Hefter	USITT	P	U
Bill Hewlett	ImageCue LLC	ImageCue LLC	O	MP
Julian Hoare	Tait Towers	Tait Towers Manufacturing LLC	A	MP
Jeremy Hochman	Full Throttle Films/ VER	Full Throttle Films/ VER	A	DR
Jon Hole	Zero 88	Eaton	P	MP
Jim Holladay	Luxence	Luxence	O	G
Maurits van der Hoorn	Pathway Connectivity	Acuity Brands Inc.	A	MP
Wayne David Howell	Artistic Licence Engineering Ltd.	Artistic Licence Holdings	O	DE
John Huntington	City Tech, Ent Tech Department	I.A.T.S.E. Local 1	A	U
Eric Johnson	Eric Johnson	Eric Johnson	O	G
Rob Johnston	Interactive Technologies, Inc.	Interactive Technologies, Inc.	O	MP
Tyrone Mellon_Jr.	Lex Products	Lex TM3	P	CP
Michael Karlsson	LumenRadio AB	LumenRadio AB	P	MP
Jonathan Kemble	High End Systems	Barco	O	MP
Paul Kleissler	City Theatrical, Inc.	City Theatrical, Inc.	P	MP
Edwin S. Kramer	I.A.T.S.E. Local 1	I.A.T.S.E. Local 1	P	U
Ulrich Kunkel	E3 Engineering & Education for Entertainment GmbH	E3 Engineering & Education for Entertainment GmbH	P	U
Jason Kyle	JPK Systems Ltd.	JPK Systems Ltd.	O	MP
Roger Lattin	I.A.T.S.E. Local 728	I.A.T.S.E. Local 728	P	U
Michael Lay	Philips Color Kinetics	Philips Lighting	P	MP
Hans Leiter	ETC GmbH	Electronic Theatre Controls, Inc.	O	MP
Jon Lenard	Applied Electronics	Applied Electronics	O	MP
Sang-Kyu Lim	ETRI	Electronics and Telecommunications Research Institute	O	G
Joshua Liposky	Lex Products	Lex TM3	A	CP
Dan Lisowski	Dept. Of Theatre and Drama	University of Wisconsin - Madison	P	DE
Kevin Loewen	Pathway Connectivity	Acuity Brands Inc.	P	MP
Jim Love	Tait Towers	Tait Towers Manufacturing LLC	P	MP
John Mehlretter	Lehigh Electric Products Co.	Lehigh Electric Products Co.	O	MP

Name	Company	Representing	Voting status	Int cat
Jeff T. Miller	Worldwide Standards and Auditing	Walt Disney Company	O	U
Daniel Murfin	Royal National Theatre	Royal National Theatre	P	U
John Musarra	John Musarra	John Musarra	O	U
Simon Newton	Open Lighting Project	Open Lighting Project	P	G
Maya Nigrosh	Electronic Theatre Controls, Inc.	Electronic Theatre Controls, Inc.	A	MP
Kimberly Corbett Oates	Schuler Shook	Schuler Shook	P	DE
Jim Ohrberg	Candela Controls, Inc.	Candela Controls, Inc.	A	DE
Danilo Oliveira	Chauvet Lighting	Chauvet Lighting	O	MP
Claude Ostyn	Full Throttle Films/ VER	Full Throttle Films/ VER	A	DR
Edward A. (Ted) Paget	Electronic Theatre Controls, Inc.	Electronic Theatre Controls, Inc.	A	MP
Jason Potterf	Cisco	Cisco	P	MP
Gary Pritchard	LSC Lighting Systems (Aust) PTY Ltd	LSC Lighting Systems PTY Ltd	O	MP
Charles Reese	Production Resource Group	Production Resource Group	O	DR
Darryl Ross	TMB	TMB	P	MP
Alan M. Rowe	IATSE Local 728	I.A.T.S.E. Local 728	A	U
Karl G. Ruling	ESTA	ESTA	exf	G
Yngve Sandboe	Sand Network Systems, Inc.	Sand Network Systems, Inc.	O	MP
Nicolai Gubi Schmidt	Gobo & Highlight A/S	Gobo & Highlight A/S	O	DR
Larry Schoeneman	DesignLab Chicago, Inc.	DesignLab Chicago, Inc.	P	DR
Ford Sellers	Chauvet Lighting	Chauvet Lighting	O	MP
Ralph Stillinger	Strand Lighting	Philips Lighting	O	MP
Dane Styczynski	Dept. Of Theatre and Drama	University of Wisconsin - Madison	A	DE
Steve Terry	Electronic Theatre Controls	Electronic Theatre Controls, Inc.	A	MP
Christopher Tilton	Westlake Reed Leskosky	Westlake Reed Leskosky	O	DE
Robert Timmerman	Philips Color Kinetics	Philips Lighting	O	MP
James Tomlinson	Team Tomlinson	Team Tomlinson	O	G
Tracy Underhill	Triple C Lighting & Controls	Triple C Lighting & Controls	O	G
Steve Unwin	Pulsar Ltd.	Pulsar Ltd.	O	MP
Ken Vannice	Ken Vannice LLC	Ken Vannice LLC	I	G
Carlo Venturati	Clay Paky S.P.A.	Clay Paky S.P.A.	O	MP
Will Wagner	Carallon Ltd.	Carallon Ltd.	O	MP
Oliver Waits	Avolites Ltd.	Avolites Ltd.	O	MP

Name	Company	Representing	Voting status	Int cat
Colin Waters	TMB	TMB	O	DR
Ralph Weber	ENDL Texas	ENDL Texas	O	G
Peter Willis	Howard Eaton Lighting Ltd.	Howard Eaton Lighting Ltd.	P	CP
Loren Wilton	Showman Systems	Showman Systems	O	CP
Adam De Witt	Adept Anomaly	Adept Anomaly	I	U
David Yellin	LightMinded Industries, Inc.	LightMinded Industries, Inc.	O	MP
Jeong Sik Yoo	Korea Testing Laboratory	Korea Testing Laboratory / Theatre Safety Center	O	DE

**Voting status key:** P = Principal voter, A = Alternate voter, I = Individual voter, O = Observer member, exf = Ex Officio member (staff)

**Interest Category Key:** CP = Custom-market producer, DE = Designer, DR = Dealer/rental company, G = General interest, MP = Mass-market producer, U = User