

Minutes
Fog and Smoke Working Group
Saturday, November 20, 1999
Peabody Hotel
Orlando, FL

Chairman: Larry Schoeneman; Interesting Products, Inc.; Principal; Producer

Recording secretary: Karl G. Ruling

Members in attendance: Murray Gellatly; A.C. Lighting Ltd.; Principal; Gen. Interest
Brad Dittmer; Associated Theatrical Contractors; Principal; User
Gary Fails; City Theatrical, Inc.; Principal; Producer
F. Lee Iwanski; Four Star Lighting (Matthews Studio Group Companies); Principal;
User
Mike Wood; High End Systems; Principal; Producer
Patrick Boyd; Jauchem & Meeh, Inc.; Principal; User (joined at this meeting)
Adrian Segeren; Le Maitre Special Effects; Principal; Producer
Tim Cox; PLASA; Principal; Gen. Interest
Martin Becker; Reel EFX, Inc.; Alternate; Producer
Eric Tishman; Rosco Laboratories; Principal; Producer
Eckart Steffens; SOUNDLIGHT (VPLT); Alternate; Gen. Interest
Nathan Kahn; Theatre Effects, Inc.; Principal (change at this meeting from observer);
Producer
Bill Hektner; USITT Vice Commissioner for Smoke and Fog Safety; Principal; Gen.
Interest
Florian Von Hofen; VPLT; Principal; Gen. Interest

1 Opening remarks

Larry Schoeneman called the meeting to order at 6:42 PM

2 Attendance and membership

2.1 Introductions of those present

Those present introduced themselves, proceeding clockwise around the table.

2.2 Determination of quorum (6 needed)

Schoeneman announced that we have a quorum

2.3 Recognition of alternate voting members

Martin Becker was recognized as voting for Reel EFX.

2.4 Requirements for membership

Schoeneman pointed out the attendance requirement:

Except for organizational members, a member's voting status will be changed to observer if he misses two consecutive meetings, pending that member's attendance at another meeting.

2.5 Processing of new membership applications

Patrick Boyd of Jauchem and Meeh applied as a principal voting member and asked that Greg Meeh be changed back to a voting member.

Nathan Kahn also pointed out that he should be a voting member again, since he is attending the meeting after a hiatus.

Schoeneman asked Boyd to leave the room while he polled the voting body on accepting Boyd's application. The members of the working group unanimously consented to accepting Boyd's application and the change of status for Meeh.

2.6 Processing of changes to observer status

None at this meeting.

3 Approval of minutes from the previous meeting

Tim Cox had commented via e-mail:

I have a couple of comments that have arisen after the last Fog working group meeting.

Firstly, I read in the draft minutes (item 9.1, p4) that PLASA will give GBP 2500 towards the cost of the stink test. Actually, this figure should be USD 2500, which works out at about GBP 1514.

Then where that same section goes on to note that a company had advertised making fluid with only PLASA approved chemicals, I'd like to add the following at the end. "Having approach the company, Tim Cox found that the employees had misinterpreted the list of chemicals included in 'Report on Investigation into Safety of Smoke Machines' (PLASA, 1990). He received assurances that the claim would be removed from future advertising."

Bill Hektner moved that the minutes with the changes recommended by Tim Cox be accepted. The motion was seconded. The motion was accepted unanimously by a show of hands.

4 Approval of Agenda

Mike Wood moved that the agenda be accepted as written. The motion was seconded. Unanimous.

5 Call for patents

Larry Schoeneman read the following:

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

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

6 Anti-Trust Statement

Larry Schoeneman also read the following:

"The ESTA Board of Directors, the Technical Standards Committee, and the leadership of this Working Group will reject or nullify any actions that restrain trade. Anyone who feels that an action restraining trade is being or has been taken is requested to bring the matter to the attention of the chair immediately. Anyone who feels that actions in restraint of trade have been taken and not properly annulled is requested to notify the TSC chair or ESTA president immediately."

"ESTA legal counsel has informed us that any member of this working group may be found individually liable for any action that restrains trade taken by this working group. An individual convicted of a violation of the Sherman Act may be fined as much as \$100,000 and be imprisoned for up to three years. An easy to read pamphlet describing restraint of trade is available from the Technical Standards Committee."

7 Task Group Reports

7.1 Fog standard E1.5

Schoeneman reported on his attempt to contact Ken Wilmarth and Larisa Rudenko at Life Sciences Consultancy. He has had no success in contacting them by e-mail or telephone. Schoeneman agreed to write a letter stating that our relationship is terminated if we don't hear from them.

Eric Tishman and Mike Wood agreed to contact their toxicologists to gauge their interest in working with us.

7.2 Fog machine instruction manual standard

Ruling reported that the motion to send it to public review had passed in both the working group and the TSC. Ruling will file the necessary form with ANSI to request the announcement of the public review.

7.3 Fog Book III comment resolution (Everybody)

Post-It notes were used to sort out which comments needed to be discussed. The first document tackled was "Responses to MDG FOG GENERATORS LTD. Comments on fs99-3007.pdf" (F&S/99-3015), the responses to the comments from MDG on the version vetted at the last meeting.

From the MDG comments:

2 Referenced text (page 4):

Haze is a subtle, light atmosphere that is *without texture*² and virtually invisible. The audience or the camera may not see it until beams of light shine through it at just the right angle. Haze is really an effect for making the volume of a performance space visible, and it should be imperceptible except for the effect it has on the light in the space. *It is used often in rock concerts to make the beams of light from the automated luminaires visible, and it is used in film work to add a subtle diffusion to the scene and to lighten the shadows and reduce contrast.*²

Comment: What is a texture, is it volutes. Rock concerts most Broadway and west end show.

Response: In conversation at PLASA, Marc explained that "texture" is a confusing term because it does not describe the differences between fog and haze. "Volutes" is a better term to him because it describes the swirling motion that is visible in fog, but not visible in a haze.

Delete "without texture" and rewrite the sentences to read, "**Haze** is a subtle atmospheric effect that is almost invisible to the audience or camera until beams of light shine through it." "Volutes" is a good word, but it's not part of the average reader's vocabulary, and I'm not persuaded that we should work to make it part of the vocabulary.

The examples of the uses of haze are illustrative only, and not part of an exhaustive list. One example, such as rock concerts, is good enough to suggest how haze is used to reveal light beams. Make no change.

Working Group response: By consensus, the response was accepted as written.

3A Referenced text (page 4):

Fog is much denser than a haze. It has *texture*^{3A} to it and the viewer can often see air currents as the droplets are lifted and carried by the air. Fog often looks like smoke

Comment: Texture or volutes?

Response: The question is unclear. The word in the text is "texture," and I think this will make sense to the readers. In scene painting, spattering, rag rolling, flogging, et cetera are all ways of giving "texture" to a flat wall, and fog has a similar effect on air.

Working Group response: By consensus, the response was accepted as written.

4 Referenced Text (page 4):

Fog may be required to last for a long time during film shoots, but in live performance it is usually desirable to have it dissipate fairly quickly. Slow and fast evaporating fluids are used to meet these different needs. *The droplets of fog are larger, generally from 2 to 5 microns in diameter*⁴, so the movement of the fog in the air is more obvious than it is with a haze. The larger droplets also tend to float for a shorter length of time than do the tiny droplets in a haze. Because the droplets are larger and because the fog is generally denser than a haze, more fluid is used to create a fog than is used to create a haze.

Comment: At that size they don't evaporate they settle. Also the size produces is somewhat unknown since a respectable company who has thousands of unit on the market was saying up to a little while ago that their particles where from .5 to 60 micron.

Response: Make no change. Everything that has a vapor pressure evaporates. The settling rate depends on air currents as well as particle size. The size of the particles comes from Ken Wilmarth's measurements, not from advertising copy. Some machines may produce particles as big as 60 microns, but they quickly fall out of the air.

Working Group response: By consensus, the response was accepted as written.

10 Referenced text (page 6):

All the above fog fluids evaporate in some reasonable length of time. For haze effects, fluids that essentially never evaporate are most often used. The reason for this is that hazes are fogs with extremely small droplets. The ratio of the droplet volume to its surface area is such that volatile fluids will make the droplets evaporate and disappear too quickly. As a result, most hazes are produced with highly refined mineral oil, and less often are produced with fluids that are composed entirely of polyethylene glycol 200 (PEG 200) or triethylene glycol¹⁰.

Comment: This paragraph needs to be discussed at length.

Response: The paragraph already has been rewritten in response to other comments in F&S/99-3007r2. Thus, this comment is no longer relevant.

Working Group response: By consensus, the response was accepted as written.

15 Referenced text (page 8):

If a performer or technician does not get enough oxygen in the air they breathe, they can become faint. If this happens, they must be revived quickly with fresh air. Also, these gases (especially carbon dioxide, which is heavier than air) tend to accumulate in low-lying places. **Never allow someone to lie down in a fog¹⁵** created by a cryogenic method. Be sure the orchestra pit, any other low-lying areas, and any cryogen storage areas have adequate ventilation.

Comment: It depends on the concentration.

Response: Make no change. This is true, but since it is unlikely that anyone has any idea of what the concentration is or how to control it, the blanket prohibition is the only thing to recommend.

Actually, this paragraph is misleading and the grammar is not correct. "They can become faint" makes it sound like that is the worst that could happen. In fact, they could die. Rewrite to read (underlining shows changes):

If a performer or technician does not get enough oxygen in the air he breathes, the first symptom will be that he becomes faint, fatigued, or light-headed. If this happens, he must quickly receive fresh air. Also, these gases (especially carbon dioxide, which is heavier than air) tend to accumulate in low-lying places. Never allow a person to lie down in a fog created by a cryogenic method. Be sure the orchestra pit, any other low-lying areas, and any cryogen storage areas have adequate ventilation.

One thing that troubles me is that we never tell people in the book that too little oxygen or too much carbon dioxide can kill them. I think we have an obligation to point this out, particularly since Actors Equity seems intent on promoting dry ice and liquid nitrogen fogs as the only safe fogs, and this may result in more fools embracing these technologies. I propose putting a warning in the sections on exposure limits for nitrogen and carbon dioxide. (The underlining shows the changes. These words will not be underlined in the book.)

Toxicity: Safe environmental concentrations for nitrogen and carbon dioxide have been established by the Occupational Safety and Health Administration (OSHA) in the United States and the Health and Safety Commission (HSC) in the United Kingdom. The Health and Safety Executive in the UK also publishes guidelines for workplace safety, and there is legislation in the UK that applies to the atmospheres of specific work places.

Nitrogen: Since nitrogen is not bioactive (that is it is inert insofar as your body is concerned), safe concentrations of nitrogen are stated in terms of remaining concentrations of atmospheric oxygen. The atmosphere is normally about 21% oxygen (O₂). Nitrogen can be added to the atmosphere until the oxygen level falls to 19.5%, according to OSHA regulations in the U.S., or to 18% according to HSE guidelines in the U.K. HSE also notes that the Mines and Quarries Act of 1954 requires that oxygen levels never be allowed to fall below 19% by volume. This is obviously a more conservative level than that imposed on general industry, but is not so conservative as the levels set by OSHA. Breathing air with reduced levels of oxygen causes impaired coordination and judgement, so these minimum levels are set to avoid accidents in their respective industries. Lower levels of oxygen, besides increasing the risk of accident, can lead to unconsciousness. Extremely low oxygen levels can cause death. Both automated and inexpensive hand-held O₂ monitoring equipment are available. Material safety data sheet (MSDS) information is available from your industrial gas supplier or by the Internet at <http://hazard.com> and many other sites.

Carbon dioxide: Carbon dioxide is bioactive, affecting respiration and the transfer of oxygen to the bloodstream through the lungs. The OSHA permissible exposure limit (PEL) time-weighted average (TWA) for acceptable exposure over an 8-hour workday and the HSC occupational exposure standard (OES) for CO₂ is 5000 parts per million, or 0.5%. In the U.S. CO₂ also has a short term exposure limit (STEL) for no more than 15 minutes of 30,000 ppm (3%), while the HSC short term limit is half that. Carbon dioxide is weakly narcotic at 3%, causing reduced hearing acuity and increased pulse rate and blood pressure. Levels above 7% can cause unconsciousness in a few minutes. High carbon dioxide levels can cause death. Both automated and hand-held CO₂ monitoring equipment are available. MSDS information is available from your industrial gas supplier or by the Internet at <http://hazard.com>.

Working Group response: Response accepted by consensus

19 Referenced text (page 10):

Gas-propelled machines use a fluid (high-grade mineral oil or a solution of one or more glycols and water) that is stored in an on-board tank is mixed with a non-flammable gas, either carbon dioxide (CO₂) or nitrogen (N₂), **from a pressurized gas bottle**¹⁹.

Comment: No need to have pressurized it is a known fact that all gas bottle is under pressure.

Response: Make no change. This is not a known fact. Various methods have been used historically to store gas at atmospheric pressure or at pressures only slightly above one atmosphere.

Working Group response: By consensus, add the word standard in front of "pressurized."

23 Referenced text (page 11):

Gas-propelled fluid fog machines can easily be left running during an entire production because of their quietness and very low fluid consumption. Since the droplets produced by these machines are very small, they have a very long hang-time²³.

Comment: This paragraph has to be rewritten.

Response: Accept. The entire paragraph has been struck.

Working Group response: By consensus, the response was accepted as written.

29 Referenced text (page 14):

Crackers, sprayers, and ultrasonic fog machines normally are used to create a fine, almost invisible, haze to enhance light beams and add dramatic atmosphere. A high-grade mineral oil or low evaporation rate glycol is normally used in the fluid to give the haze a long hang-time. The machines are often left running continuously during a production, set to an appropriate output level to give a constant level of haze. ***They are particularly sensitive to drafts and air handling systems because of the relatively low output***²⁹.

Comment: The fact that they are sensitive to drafts is either too much water or particle size that are too big.

Response: Accept in part. Particle size and water content is not the issue here. The issue is that most of these machines have a low rate of fog production and do not blow the haze out in a visible plume, so if they have to fight a high rate of air exchange in a ventilation system or drafts blowing away from the stage, they might lose. This is an important point that needs to be made so the reader will get the greatest level of satisfaction possible while using these machines.

Change to read: "Most of these machines produce haze at a slow rate and do not discharge the haze in a conspicuous plume, so it is important that drafts and ventilation systems be controlled so as not to blow the effect away from where it is needed."

Working Group response: By consensus, delete the last sentence, the sentence to which MDG had objected.

37 Referenced text (page 1):

Today's atmospheric effects are fundamentally different from most of the earlier effects in that they are almost always fog effects. The fog might be shot from a machine in a big burst that looks like smoke, or it might roll across the floor as low, white clouds, or it might float almost invisibly in the air as a thin haze, but almost all modern atmospheric effects are fogs: tiny droplets of liquid floating in the air. ***Glycol-based fog systems (often called a "smoke machine") produce a fog in which the droplets are a mixture of water and glycol or glycerin***³⁷. The familiar dry ice fog machine produces a fog in which the droplets are water. ***The machines known as "crackers" produce a thin haze of highly refined mineral oil***³⁷. All of them produce aerosols of liquid droplets suspended in the air.

Comment: Glycol based or highly refined mineral oil based fog systems, droplets are either pure mineral oil or a mixture of water and glycol or glycerin. The machine known as crackers produces a thin haze of either highly refined mineral oil or glycol based mixture.

Response: Make no change. The suggested text does not enhance the document by adding information, deleting erroneous information, or promoting clarity.

Working Group response: Change the last highlighted sentence to read: "The machines known as "hazers" produce a thin haze of highly refined mineral oil, glycol, or some other fluid."

The following comments from "Summary of Comments for Comment Period Ending on September 28, 1999 Regarding The Introduction to Modern Atmospheric Effects (F&S/99-3007r2) and the Responses to Them" (F&S/99-3014) were addressed after using the Post-It note technique to identify any points of controversy:

8 Comment: general (page 8 and 14) Credit is being given to several who developed technologies or improved them and won awards. Should this same respect be given to the developer(s) of L.S.A., and in the discussion of hazers, who developed crackers, sprayers and ultrasonic technology?

Brad Dittmer

ASTC

Response: Reject.

If I remember correctly, Jim Foley, who works for UCISCO, the company that developed this technology, contributed to this section, so it must be okay with him. I don't remember why he and we didn't praise some individual or the company, but we didn't, and there was a reason. I'd be happy to add credits for the development of crackers and sprayers, but I don't know who developed them.

As to ultrasonics, does Mike Wood want the credit, or is there someone else at JEM we should praise? I'm a little leery of pushing the ultrasonic technology too much. I think it's cool, and I can make it work just fine at home, but Martin, the new owners of JEM, seem to have stopped promoting it. Some machines still exist, so I think we should explain the technology, but I don't know that we should hail it.

Working Group response: After a discussion of whether to credit any individuals or not, the working group decided by consensus to add one additional credit:

"**Sprayer** fog technology is another technology that uses high-grade mineral oil or pure glycol to produce a very fine haze. Jim Gill was considered for a Technical Achievement Award for this process by the Academy of Motion Picture Arts and Sciences in 1986. The machines are compact and self-contained, and are among the most popular forms of haze machines."

The working group also decided that on page 2 of the new document, "from" should be changed to "since" when indicating the passage of time.

"So reported the New York Mirror about a dramatization of Ivanhoe at the Bowery Theatre in 1831. Atmospheric effects have been part of theatrical productions *since* long before this show, almost *since* the beginning of theatre. The Greeks used burning pitch and resinous torches, and in Shakespeare's time the smoke from black powder charges blew across the stage of the Globe outside London. Over the years a wide variety of methods have been used to make something that looks like smoke, clouds, haze, or mist."

The working group also discussed the quick review table in the back of the book, and decided to add the following cautions about residue build-up in filters, which are shown in italics:

Machine type	Key ingredients	Typical uses	Cautions: Adverse conditions that may occur in certain situations	See pages
Cracker	Mineral oil	Haze- accentuated light beams	Slippery residue with prolonged use. Residue build-up in air filters.	TK
Cracker	Glycol with water	Haze- accentuated light beams	Slippery residue with prolonged use. Possible irritation reactions. <i>Residue build-up in air filters.</i>	TK
Cryogenic burst	Liquid nitrogen or liquid carbon dioxide	Varied	Oxygen deficiency. Cryogen handling.	TK
Dry ice & hot water	Dry ice	Ground cover	Slick. Liquid accumulation at output. Oxygen deficiency. Cryogen handling. CO ₂ toxicity.	TK
Heated, pressurized gas	Glycol with water or mineral oil alone	Varied	Slick. Liquid accumulation at output. Possible irritation reactions.	TK
Heated, pump or compressed air	Glycol with water	Varied	Slick. Liquid accumulation at output. Possible irritation reactions.	TK
High pressure water	Water	Varied	Wetness from large droplets. Fallout. Liquid accumulation.	TK
Liquid nitrogen & hot water	Liquid nitrogen	Ground cover	Slick. Liquid accumulation at output. Oxygen deficiency. Cryogen handling.	TK
Liquid synthetic air & hot water	Liquid synthetic air	Ground cover	Slick. Liquid accumulation at output. Cryogen handling.	TK
Sprayer	Mineral oil	Haze- accentuated light beams	Slippery residue with prolonged use. Residue build-up in air filters.	TK
Sprayer	Glycol	Haze- accentuated light beams	Slippery residue with prolonged use. Possible irritation reactions. <i>Residue build-up in air filters.</i>	TK
Ultrasonic	Water with glycol	Haze- accentuated light beams	Slick. Liquid accumulation at output. Possible irritation reactions.	TK

Eckart Steffens moved that the resolutions offered in the two documents be accepted with the above changes. Brad Dittmer seconded the motion. Unanimous by show of hands.

Mike Wood moved that the amended Introduction to Modern Atmospheric Effects document be sent to the TSC for approval for publication. Eddie Kramer seconded the motion. unanimous by show of hands.

7.4 Responsible Product Stewardship Program

Mike Wood reported that he had rewritten the program documents a bit and submitted to the ESTA lawyer, who saw nothing wrong with it. Wood and the task group agreed to revise it further and to circulate it among the working group in time for the next meeting.

7.5 Data collection task group

Mike Wood agreed that he and Byron Ziegler will do some local tests as a start.

8 Old Business

None.

9 Liaison Reports

9.1 PLASA (Tim Cox)

Tim Cox reported "Nothing exciting." He said that he had found a new, fog-related British Standard, BS 7939: 1999. It's a standard for fog machine security devices.

8.2 JATET (Schoeneman)

No news.

8.3 VPLT (von Hofen)

Florian von Hofen reported that the acceptance of international standards work has increased in the association, so funding will be much less difficult to obtain.

8.4 The Kramer and Fails Report

Fails had little news. Kramer said liquid N₂ is being used on Lion King. The operators had to be certified as cryogenic operators.

8.5 NFPA

Schoeneman reported that the NFPA's pyrotechnic standard, 1126 is being reviewed to make the language more common with flame effects standard NFPA 160.

Schoeneman also reported that Monona Rossol had offered proposals to NFPA to make 1126 deal with air quality. Most of these proposals were rejected by the committee.

10 New business

10.1 Suggestions for programs that would be both popular and educational to the public

The following suggestions were offered:

Gary Fails suggested that the Nebulous Effects seminar would sell if it were for free or about \$25.

Martin Becker argues that the independent CIH or an OSHA person is a necessary part of the seminar to give it credibility.

Adrian Segeren felt that the F&S Working Group members would promote it more heavily if they knew that 50% of the gate went to ESTA.

Many suggested that we do the event offsite.

It was suggested that case histories of impressive fog installations would draw an audience.

Florian von Hoffen said that in Germany people don't care to pay for product demos, and suggested that this is true in the States too. The program needs non-manufacturer experts.

It was suggested that an analysis of the Equity/League study would be good when that is finished.

It was suggested that fog machine maintenance sessions might be good.

It was suggested that we can add additional value by offering publications as part of the seminar packet.

It was suggested that backstage tours of shows with fog effects might be interesting.

It was suggested that a session on conflict management, working with actors and audience, would be good.

10.2 Suggestions for articles in Protocol or other publications

It was suggested that we could do a story on the fog inventions developed by Doyle, Mee, and Gill.

11 Other business

Tishman reported that Equity has gotten a fog ban built into some contracts, particularly the SPT contract and the Letter of Agreement. A fog ban is being built into the LORT D contract, too.

Florian reported that World Expo 2000 will be in Hanover. He offered VPLT's assistance to any of our members who are displaying.

12 Schedule for future meetings

Schoeneman reported that the next meeting will be January 22, 2000, at 7:00 p.m. in Irving, TX.

The following meeting will be March 24, 2000, at 7:00 p.m.

The meeting following that one will be July 14, 2000 at 7:00 p.m.

13 Adjournment

Brad Dittmer moved that the meeting adjourn. The motion was seconded. Unanimous. The meeting was adjourned at 21:58.

Fog and Smoke Working Group Membership List at End of November 20, 1999 Meeting

Name	Company	Prnt Co./Org Represented	Voting Status	Interest Category
Murray Gellatly	A.C. Lighting Ltd.	A.C. Lighting Ltd.	P	G
Hugh A. Rose	Alliance of Motion Pict. & Television Prod.	Alliance of Motion Pict. & Television Prod.	O	G
Brad Dittmer	Associated Theatrical Contractors	Associated Theatrical Contractors	P	U
Patrick O'Rourke	Big Apple Lights	Big Apple Lights	O	U
Gary Crawford	C.I.T.C.	C.I.T.C.	O	P
Gary Fails	City Theatrical, Inc.	City Theatrical, Inc.	P	P
Norman Wright	Group One	Group One	O	P
Mike Wood	High End Systems	High End Systems	P	P
Lowell Fowler	High End Systems	High End Systems	A	P
Byron Ziegler	High End Systems	High End Systems	A	P
Edwin S. Kramer	IATSE, Local 1	I.A.T.S.E. Local 1	P	U
Larry Schoeneman	Interesting Products, Inc.	Interesting Products, Inc.	P	P
Jack Suesse	J.R. Clancy, Inc.	J.R. Clancy, Inc.	O	G
Patrick Boyd	Jauchem & Meeh, Inc.	Jauchem & Meeh, Inc.	P	U
Greg Meeh	Jauchem & Meeh, Inc.	Jauchem & Meeh, Inc.	A	P
Adrian Segeren	Le Maitre Special Effects	Le Maitre Special Effects	P	P
Randy Segeren	Le Maitre Special Effects	Le Maitre Special Effects	A	P
Jon Petts	Jem Smoke Machine Co, Ltd.	Martin Professional A/S	O	P
F. Lee Iwanski	Four Star Lighting	Matthews Studio Group Companies	P	U
Marc Gingras	MDG Fog Generators Ltd.	MDG Fog Generators Ltd.	P	P
Martin Michaud	MDG Fog Generators Ltd.	MDG Fog Generators Ltd.	A	P
Monona Rossol	Monona Rossol	Monona Rossol	O	G
Tim Cox	PLASA	PLASA	P	G
Tony Douglas-Beveridge	PLASA Standards Office	PLASA	A	G
George Sabbi	PRG Lighting Group	PRG	O	U
Jim Gill	Reel EFX, Inc.	Reel EFX	P	P
Martin Becker	Reel EFX, Inc.	Reel EFX	A	P
Eric Tishman	Rosco Laboratories	Rosco Laboratories	P	P
Dan Faulkner	Rosco/Entertainment Technology	Rosco Laboratories	A	P
Heinz Siller	RST Präsentationssysteme	RST Präsentationssysteme	O	G
Beverly Huggins	SFX Design, Inc.	SFX Design, Inc.	O	P
Nathan Kahn	Theatre Effects, Inc.	Theatre Effects, Inc.	P	P
Thomas Costello	TJC and Associates	TJC and Associates	O	G
Colin Waters	TMB Associates	TMB Associates	O	G
James F. Foley	UCISCO, Inc.	UCISCO, Inc.	O	P
Rob Schneider	University of Arizona, Department Of Theatre	University of Arizona, Department Of Theatre	O	U
Bill Hektner	USITT Vice Commissioner for Smoke and Fog Safety	USITT	P	G
Florian Von Hofen	VPLT	VPLT	P	G
Eckart Steffens	Soundlight	VPLT	A	G
Gunther Schaidt	Safex Chemie	VPLT	A	P
Jeffrey Lind	Walt Disney Imagineering	Walt Disney	O	U
Michael Zilz	Zilz International GmbH	Zilz International GmbH	O	G

Voting Status

- P Principal voting representative for a company or organization
- A Alternate voting representative for a company or organization
- I Individual representing no organization other than himself or herself
- O Observer; non-voting

Interest Categories

- P Producer (manufacturer) of fog or smoke effects
- U User of fog or smoke effects
- G General interes