



- ICTA Los Angeles – 2017
- LIPA Progress and Highlights from the Annual General Meeting

Introduction to LIPA



In the early days...

Laser guys tried many ways to get into PROJECTION



Introduction to LIPA

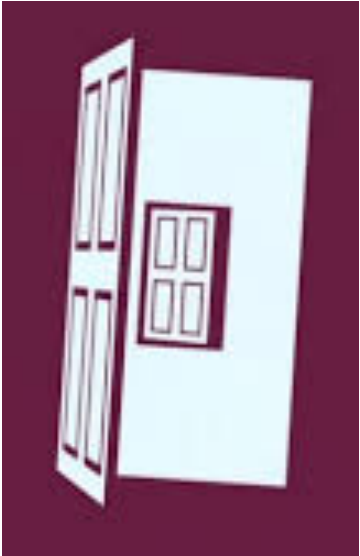


When Hollywood decided to GO DIGITAL...

The door FINALLY OPENED to Laser Illuminated Projection



Introduction to LIPA



But when that door opened...

Another door appeared: LASER SHOW REGULATIONS

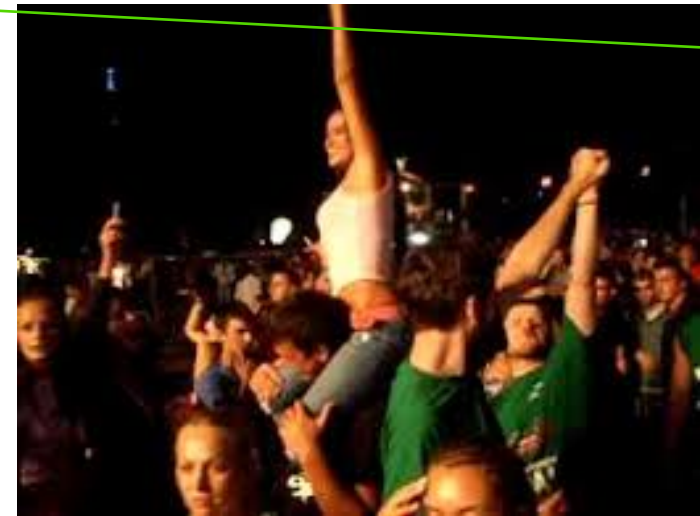


Origin of Laser Show Regulations



In 1970s, Laser Light Shows (LLS) were new and DANGEROUS

The US Food and Drug Administration (FDA) was told by the US government to regulate laser shows for *audience eye safety*



Laser *Illuminated* Projection is NOT a LASER SHOW

A Laser Illuminated Projector (LIP) is NOT a LASER SHOW



But who could explain this to the FDA and the global
International Electro-technical Commission (IEC)?



A Single Voice was needed

THE FOUNDING OF LIPA

LIPA's Four Missions

1. Be a **SINGLE VOICE** for Laser Projection Regulatory Reform
2. Provide a **FORUM FOR DISCUSSION** and consensus building
3. **EDUCATE** key industry stakeholders and the market
4. Develop and promote “**BEST PRACTICES**” for the industry

LIPA's Early Successes

- Major technical paper proving that LIPs were no more dangerous than Xenon projectors of equal RADIANCE (optical watts, not lumens)
- Simplification of the FDA “Variance” process to allow Laser Projectors to be installed and operated in Cinemas
- Developed global IEC strategy to simplify, “rationalize” and homologate LIP regulation

LIPA TODAY

PROGRESS AND STATUS

Progress on Primary Objectives

Regulatory Reform

- ✓ IEC (Global) Laser and Lamp Standards Updated and Ratified
 - ✓ IEC 60825-1:2014 for Laser Illuminated Products
 - ✓ IEC 62471-5:2015 for industry product safety – evaluates light coming through lens
- ✓ Progress on IEC related standards
- ✓ Priority for LIPA shifting to rationalizing *Non-Cinema* regulations
- ✓ “Full court press” on new leadership at FDA-CDRH has opened dialog

Recent Progress at FDA/CDRH

“The FDA CDRH technical staff **confirmed they will update current guidance document...** as much as possible in line with international (IEC) standards and some additional labeling requirements for high brightness consumer products.”

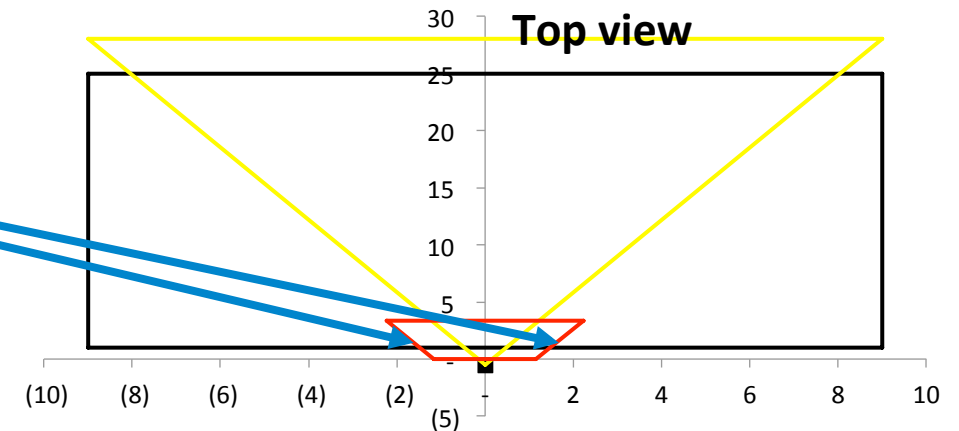
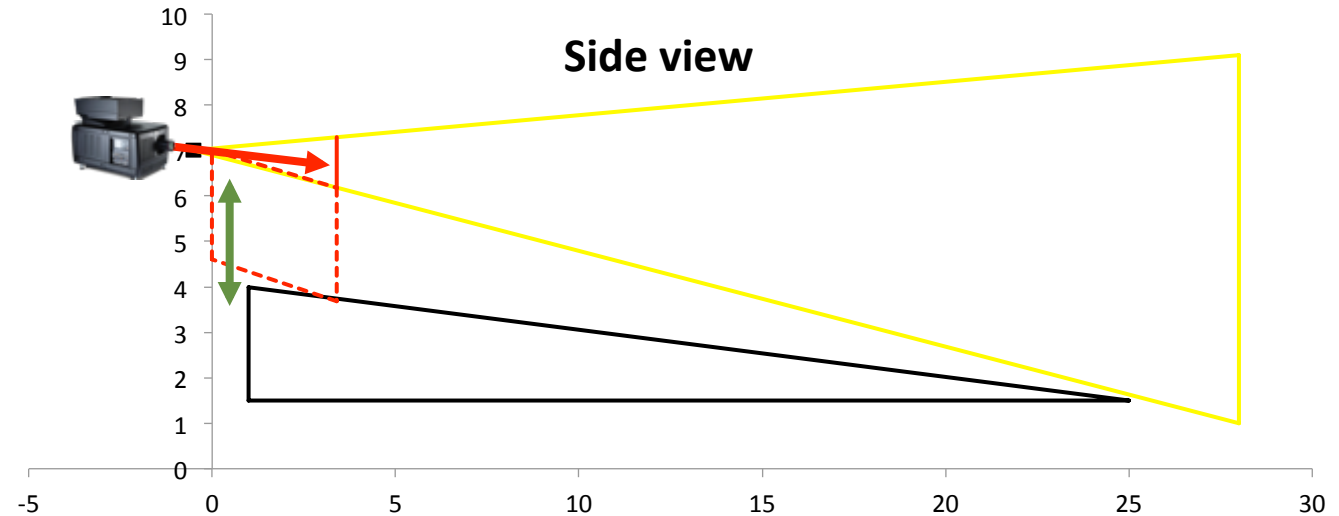
When the FDA makes this change, **the *shorter* Hazard Distance (HD) already included in updated IEC regulations will then also apply to cinema and non-cinema both.** (see subsequent slides)

Review of US Cinema Requirements

- **“Variance”** required by current US - FDA CDRH Regulation
- Barco, Christie, Dolby, Imax, NEC all have (Cinema) Variances
 - Requirements apply to RGB and Laser Phosphor technologies
- Exhibitor/Customer must comply with supplier variance conditions
- In-theater (public) safety depends on two metrics that (still) apply only to LIPs, not Xenon PJs of equal **radiance**
 - **“Hazard Distance”** (HD) from lens to point at which radiance is “safe”
 - **“Separation Height”** (SH) > 2.5 meters/8’ – 3” floor to “bottom of beam”
- Booth must have controlled access - “authorized personnel only”

HD + SH Illustration

- **Hazard Distance (HD)** from lens
 - Radiance = $1/d^2$
- **Separation Height (SH)** floor to beam 8'3"
- **No Seats allowed** within "Hazard Zone" if SH is less than 8'3"
- Any area within HD with insufficient SH needs 1 meter horizontal buffer zones left and right of light beam
- **Hazard Distance (HD)** Calculation depends on
 - RADIANCE (watts)
 - Throw Ratio
 - Apparent source size (light rectangle in lens)



Compliance is Customer Responsibility

Helpful Hints for new laser cinemas and conversions

- ✓ Work with your supplier to assure compliance with *their* variance
- ✓ Work with your architect to “design compliance into theater”
- ✓ Position booth and port so that you do not lose any seats
- ✓ Make sure controlled booth access can be achieved
- ✓ Use high transmission/anti-reflection (AR) coated port glass to avoid substantial loss of brightness and potentially harmful back reflections



Highlights from the Annual General Meeting

- November 17-18, 2016 Napa, California



26 Current LIPA Members

Lasers & Components

Projector/Laser Engine Makers

Exhibitor & Integrators

NEW = 4

Leader (13)

Participant (4)

Observer (9)

<p>NECSEL/Ushio Texas Instruments</p>	<p>Barco Casio Christie Digital Compound Photonics Dolby NEC Panasonic Seiko-Epson Sony</p>	<p>Disney Oristar Technologies</p>
	<p>Mitsubishi Delta</p>	<p>RealD IMAX</p>
<p>Appotronics Jenoptik Nichia Osram Philips Power Technology</p>		<p>Cinemeccanica Harkness Screens Moving Image Technology</p>

Annual General Meeting - Highlights

- Forum for discussion
 - Completion of IEC/ANSI Standards Update
 - Regulatory Strategy for US-FDA
- Education
 - Updates on Laser device technology
 - How LIPs Reduce Power Consumption
 - Screen technology – what was old is new again
- Best Practices
 - Speckle Metrology - Recommended Practice
 - ICDM Standards for advanced Cinema Projection

Forum For Discussion – AGM

- Completion of IEC/ANSI Standards
 - Good progress is being made in fine tuning and completing relevant IEC, ANSI and related standards
 - About a year or two away from full alignment and completion
- Regulatory Strategy for US-CDRH
 - Dual strategy in motion Plans:
 - A. Encourage new US FDA/CDRH leadership to publish a new laser notice that **substantially conforms to new global IEC Standards**
 - B. Develop **Variance templates** for various product categories to provide clear compliance path for new non-cinema laser projectors

Education – in the field and at AGM

- Over 30 public LIPA Presentations and updates in 2016 around the world
- Updates on Laser Technology (NECSEL and Nichia)
 - Review of Red, Green and Blue device and module technology and products
 - Preview of emerging laser technology
 - Evolution of Blue Laser device technology and future roadmap
- How LIPs Reduce Power Consumption (Barco)
 - Trends and summary data presented: Laser illumination reduces power consumption
 - LP is more efficient than RGB which is more efficient than Xenon
- Screen Technology (RealD)
 - Review of technical evolution of screen technology from Edison to the present
 - Description of new engineered screen surface technology and progress to date

Industry Best Practices

■ Speckle Metrology

- 2 year effort by committee of 25+ experts
- Rev 3 of Speckle measurement “Recommended Practice” (RP)
- >100 downloads at www.LIPAinfo.org
- Private seminar held for DCI and LIPA members - 3/16
- Recommended practice: “How to Dress for late Snowstorms in Boulder”

■ ICDM - New Standards

- ICDM is expanding their extensive library of metrology standards to accommodate advances driven by laser projection
- HDR, High Contrast, WCG, Speckle
- Requisite Test patterns



Major Goals for 2017

Major Goals for 2017

1. **Get new “Laser Notice” approved** and published by FDA – CDRH - substantially adopting IEC Laser Safety and Lamp Standards [IEC 60825-1:2014 and IEC 62471-5:2015]
2. **Complete remaining action items** for Global IEC and subsidiary standards
3. **Assist China standards development** for global consistency
4. **Rationalize US standards** for *Non-Cinema* applications
5. **Public Workshop on Speckle** measurement



Thank You!

From all of us at LIPA – Please join the team!

For More information visit www.LIPAINfo.org