

A black and white photograph of two firefighters in full protective gear, including helmets and oxygen tanks. They are positioned in a smoky, dimly lit environment, likely at a fire scene. One firefighter is in the foreground, holding a hose that extends across the frame. The other firefighter is slightly behind and to the right. The overall atmosphere is hazy and dramatic.

AUDIO DISTRIBUTION

AND IT'S IMPACT ON SAFETY

Presented by:

Dan Jacobs

Lencore

A low-angle, black and white photograph of several modern skyscrapers with glass facades, reaching towards a cloudy sky. The perspective is from the ground looking up, creating a sense of height and scale. The buildings are arranged in a way that they seem to converge towards the top of the frame.

INTRODUCTION

AUDIO DISTRIBUTION AND IT'S IMPACT ON SAFETY

AGENDA

Why Are We Here?	Evolution of Sound Masking Why It Matters	Underwriters Laboratories
How Did We Get Here?	Evolution of Paging	What is Mass Notification for Audio?
What is Audio Distribution for Commercial Space?	Audio Distribution and NFPA	Code Adoption



WHY ARE WE HERE?

How Did We
Get Here?

History of Lencore

Early Days of Paging &
Sound Masking



2018 BICSI Fall Conference & Exhibition



Bicsi

AUDIO DISTRIBUTION

What Is It Used For?

How Does It Get
Installed

Components
Pieces

Controls and
Maintenance

Paging – Audio
(Muzak) – Sound
Masking

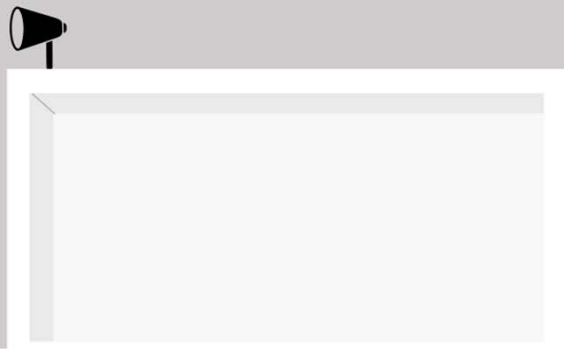


2018 BICSI Fall Conference & Exhibition



Bicsi

AUDIO DISTRIBUTION



2018 BICSI Fall Conference & Exhibition



Bicsi



SOUND MASKING

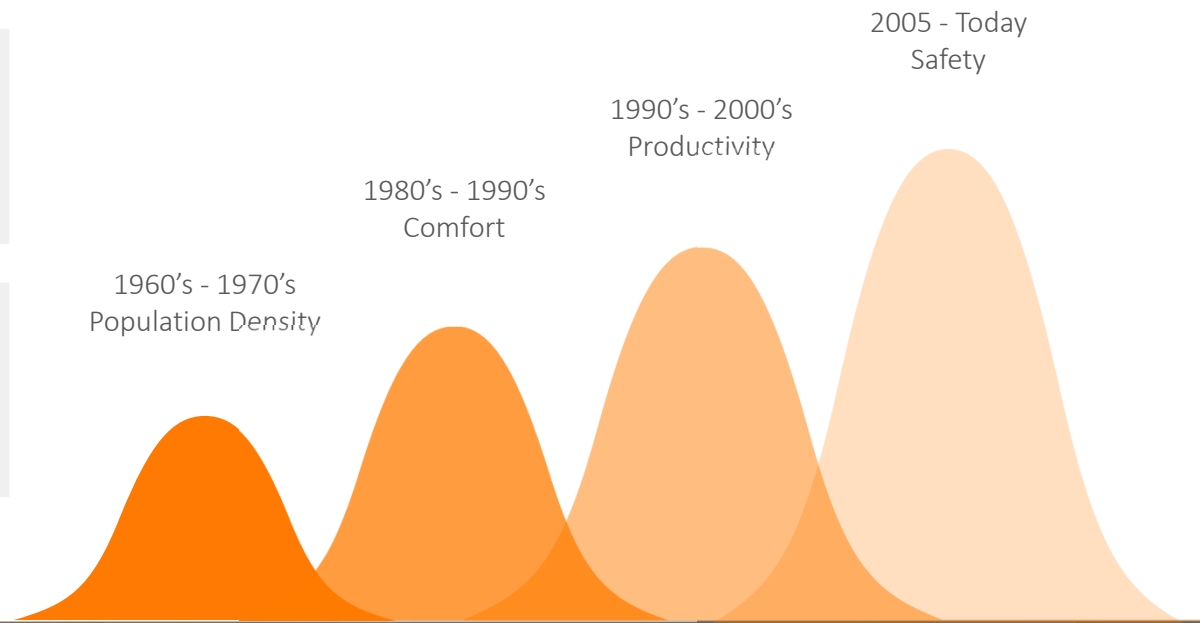
AUDIO DISTRIBUTION AND IT'S IMPACT ON SAFETY

EVOLUTION OF SOUND MASKING

Why It Matters?

Acoustics in
the Office

Why Do People Buy
Sound Masking?



2018 BICSI Fall Conference & Exhibition



Bicsi



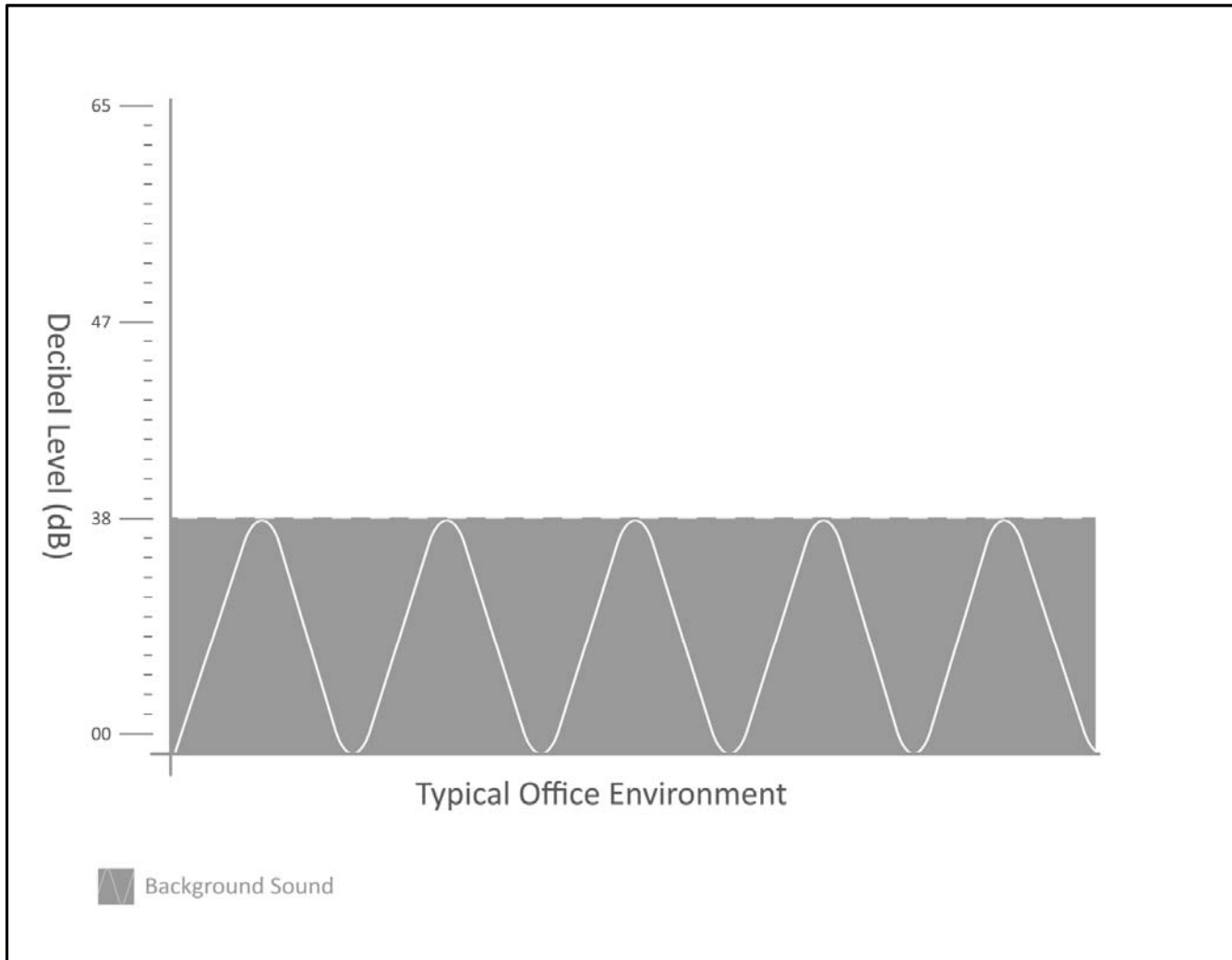
HOW DOES SOUND MASKING WORK?

AUDIO DISTRIBUTION AND IT'S IMPACT ON SAFETY



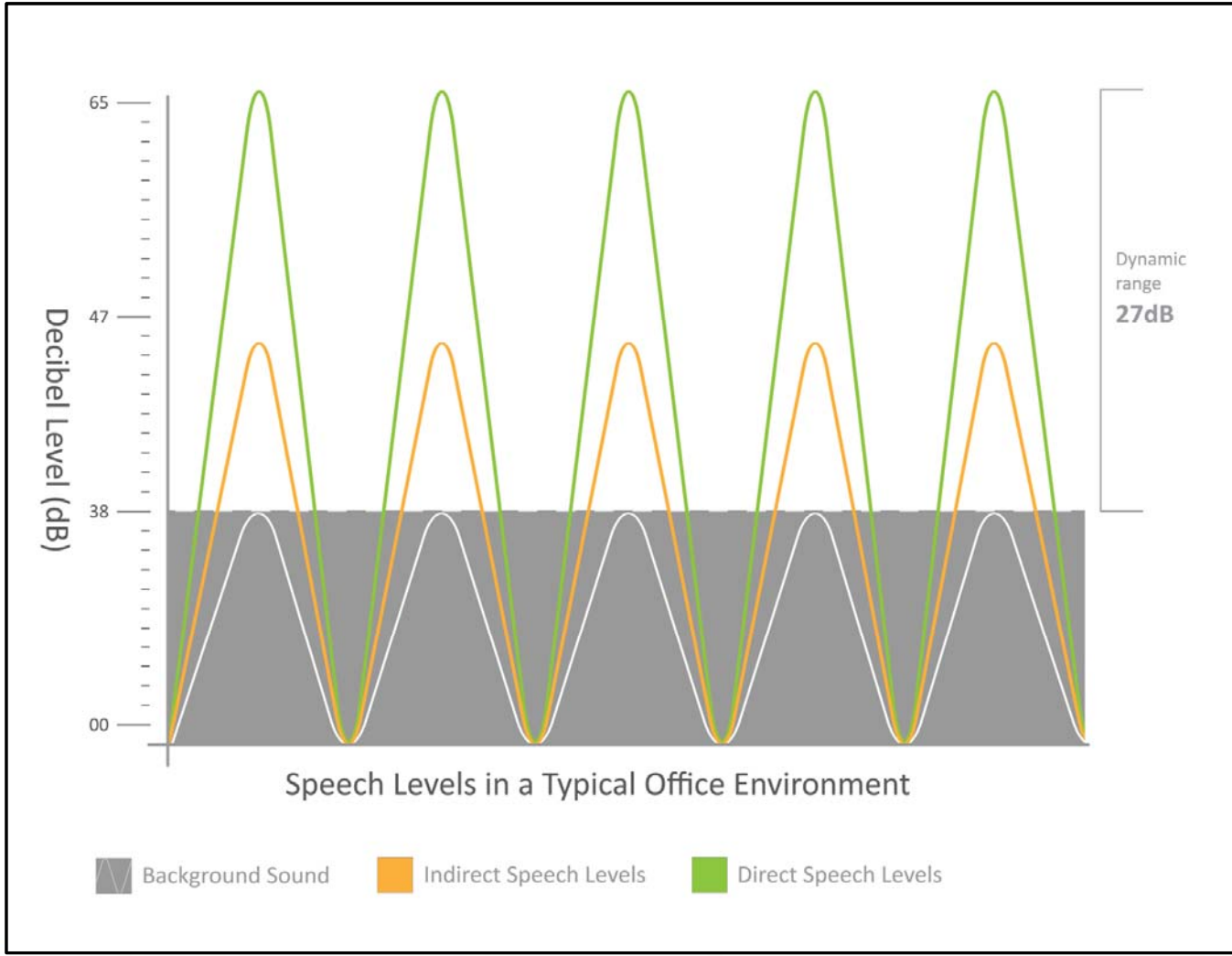
2018 BICSI Fall Conference & Exhibition





2018 BICSI Fall Conference & Exhibition





Speech Levels in a Typical Office Environment

Background Sound Indirect Speech Levels Direct Speech Levels



Decibel level (dB)



2018 BICSI Fall Conference & Exhibition





How Do We Make Speech Privacy
Comfortable in the Real World?



2018 BICSI Fall Conference & Exhibition



Bicsi



UNDERSTANDING COMFORT

Audio Distribution and It's
Impact on Safety

Origin of Sound
Good Wrap Around
Multiple Noise Sources
Uniformity of Sound
Tuning Flexibility



2018 BICSI Fall Conference & Exhibition



Bicsi

INDUSTRY STANDARD-ASTM E- 1130

Measured by a Sound Meter

ACHIEVING PRIVACY



**No Speech
Privacy**

AI of .05 or less



**Normal
Speech Privacy**

AI of .2 or less



**Confidential
Speech Privacy**

AI greater than .2



2018 BICSI Fall Conference & Exhibition



Bicsi

EVOLUTION OF PAGING

What Did Those
Systems Look Like?

How Lencore Got Into
the Paging Business

Networks

Control

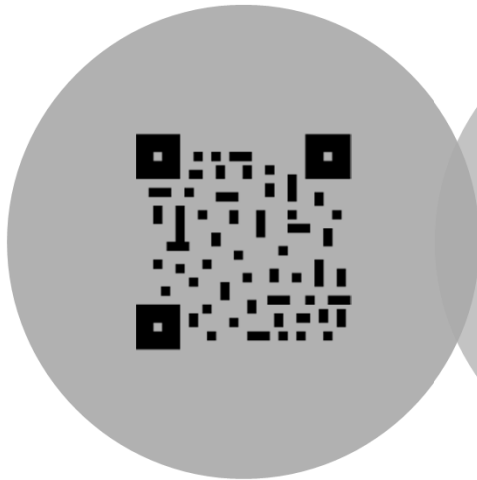




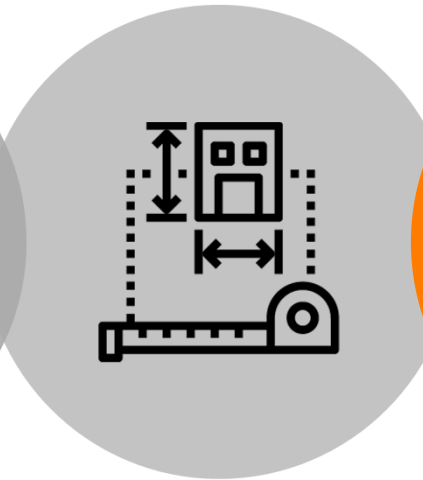
SAFETY

AUDIO DISTRIBUTION AND IT'S IMPACT ON SAFETY

HOW WE MET NFPA



Before the Code...
Requirement to Mute the Sound
Masking



Look at the
Audio Design



Align with NFPA

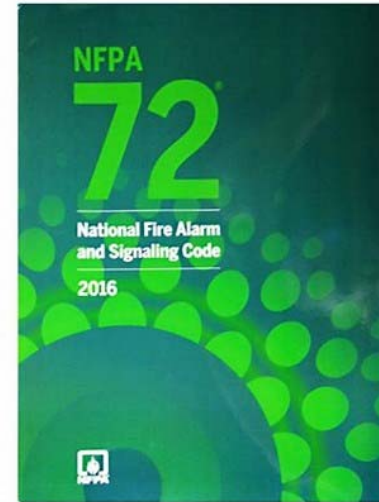
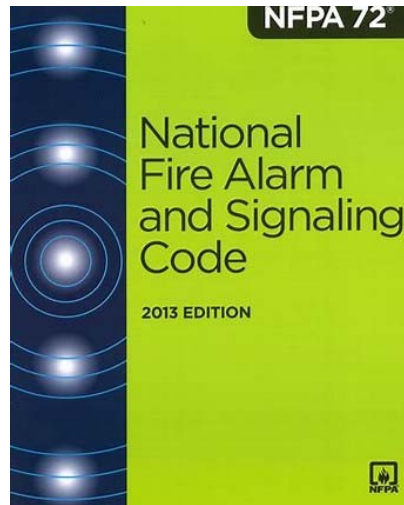
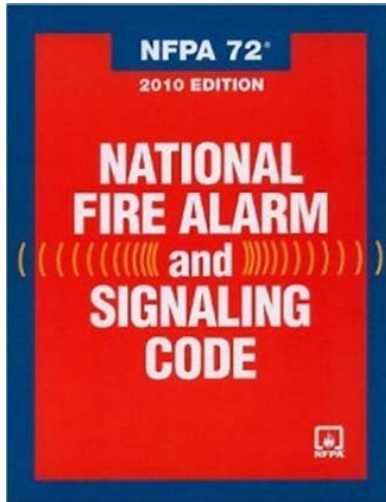


2018 BICSI Fall Conference & Exhibition



Bicsi

HOW WE MET NFPA



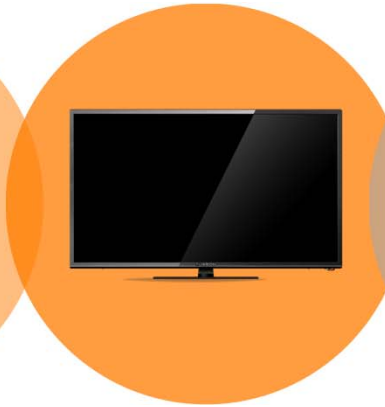
2018 BICSI Fall Conference & Exhibition



MEETING CODE AND STANDARD



APPLE TV



HD TV



SOUND BAR



DVR



2018 BICSI Fall Conference & Exhibition



Bicsi

A black and white photograph of two firefighters in full protective gear, including helmets and oxygen tanks. They are working together to manage a fire hose. The firefighter on the right is holding the nozzle, which is emitting a bright, powerful stream of water. The scene is filled with thick, white smoke, creating a hazy and intense atmosphere. The text 'UL 2572' is overlaid in the center of the image.

UL 2572

WHAT IS UL2572

UL 2572 is an equipment standard that sets the standards and criteria for how the control units for mass notification systems will be designed and tested. Not only will the control units be tested, but all of the peripheral supporting equipment that will be connected to the control units will be tested as a complete system.



2018 BICSI Fall Conference & Exhibition



Bicsi

WHAT IS UL2572

SOME EXAMPLES OF TESTING CRITERIA FOR MEETING UL2572

- Mechanical construction
- Branch circuit protection
- Field wiring terminations
- Internal wiring
- Switches, relays
- Power supplies/UPS
- Leakage testing
- Jarring
- Dielectric breakdown
- RF interference
- Monitoring for integrity and Trouble signals
- Communication links
- Prerecorded messages
- Audio Harmonic distortion
- Variable Temperature/ Humidity
- Endurance testing
- Electrical transients
- Production line testing



WHAT IS UL2572

TYPICAL OPERATIONAL FEATURES
BETWEEN A MASS NOTIFICATION SYSTEM AND A FIRE ALARM
SYSTEM

- Use Case 1- Mute masking
- Use Case 2- Audio reinforcement
- Use Case 3- Full FACP override control



2018 BICSI Fall Conference & Exhibition



Bicsi

WHAT IS UL2572

Use Case 1- Mute masking

- Signal from the FACP will instruct the MNS to mute all masking to allow for better intelligibility of the FACP audio

USE CASE 1

- MUTE MASKING



WHAT IS UL2572

Use Case 2- Audio reinforcement

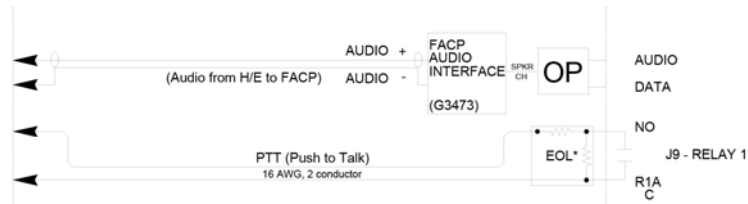
- Audio from FACP is reinforced by the MNS system
- Audio from the MNS is reinforced by the FACP. Typically in FACP override scenarios(Active Shooter).

USE CASE 2

(AUDIO REINFORCEMENT)

- AUDIO TO FACP
- PTT TO FACP

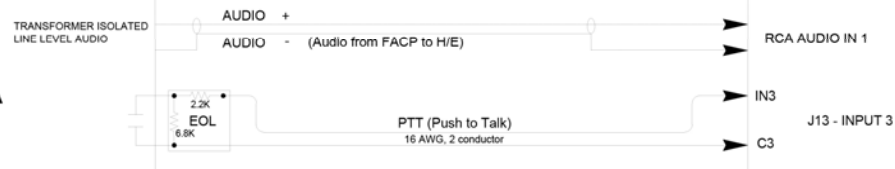
2B



(AUDIO REINFORCEMENT)

- MUTE MASKING
- AUDIO FROM FACP
- PTT FROM FACP

2A



WHAT IS UL2572

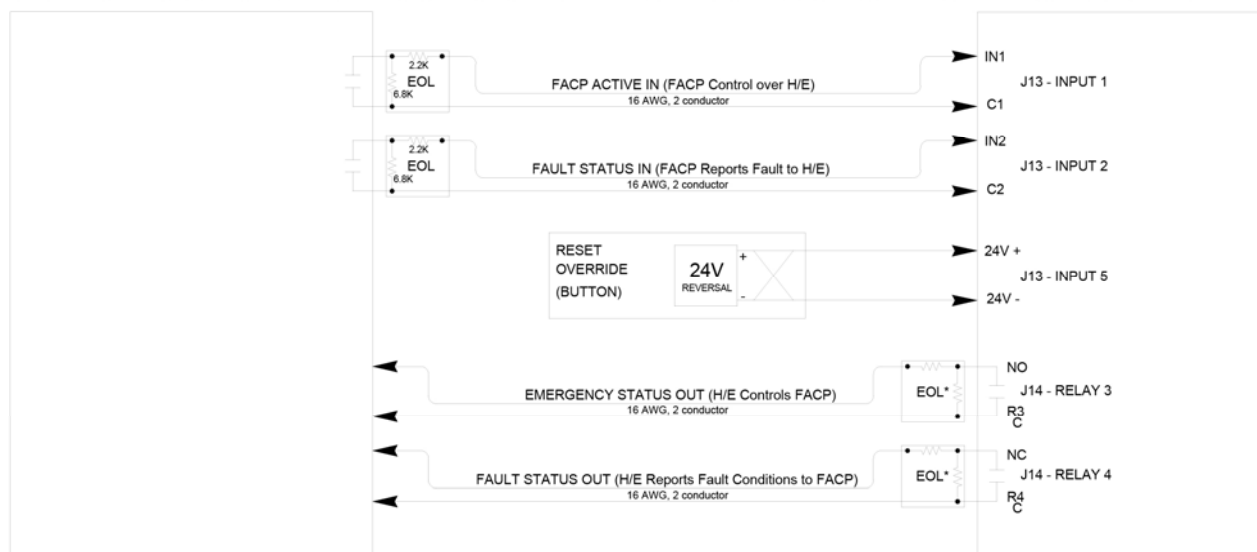
Use Case 3- Full FACP override control

- MNS emergency signals sent to FACP to shut down FACP actions
- FACP can still override the MNS
- Fault Sharing in both directions

USE CASE 3

(UL2572 MODE)

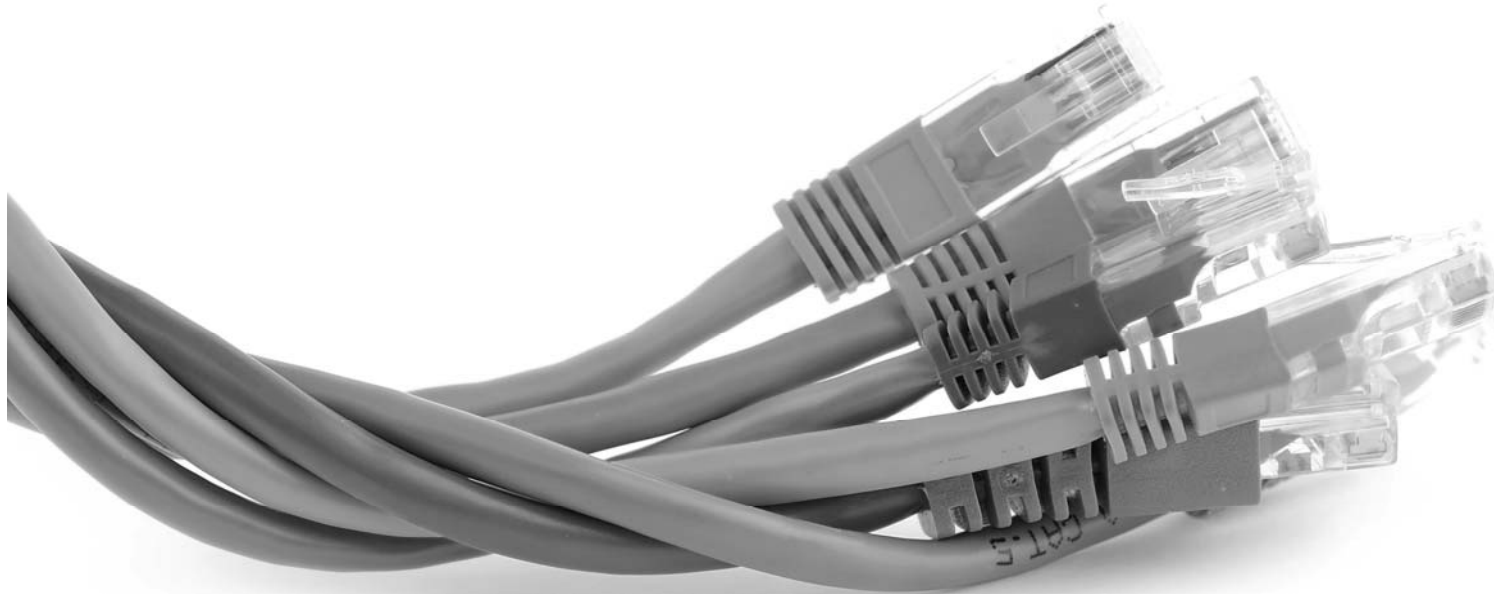
- MUTE MASKING
- AUDIO TO FACP
- AUDIO FROM FACP
- PTT TO FACP
- PTT FROM FACP
- EMERGENCY REQUEST IN/OUT
- FAULT STATUS IN/OUT
- RESET OVERRIDE BUTTON





ELIMINATION OF RISK AND CONFUSION
BY USING AND IMPROVING CODES AND STANDARDS

MEETING CODE AND STANDARD



2018 BICSI Fall Conference & Exhibition



Bicsi

MEETING CODE AND STANDARD



Round

Lever



2018 BICSI Fall Conference & Exhibition



Bicsi



VALUE

AUDIO DISTRIBUTION AND IT'S IMPACT ON SAFETY



2018 BICSI Fall Conference & Exhibition



CREATING VALUE FOR AUDIO DISTRIBUTION

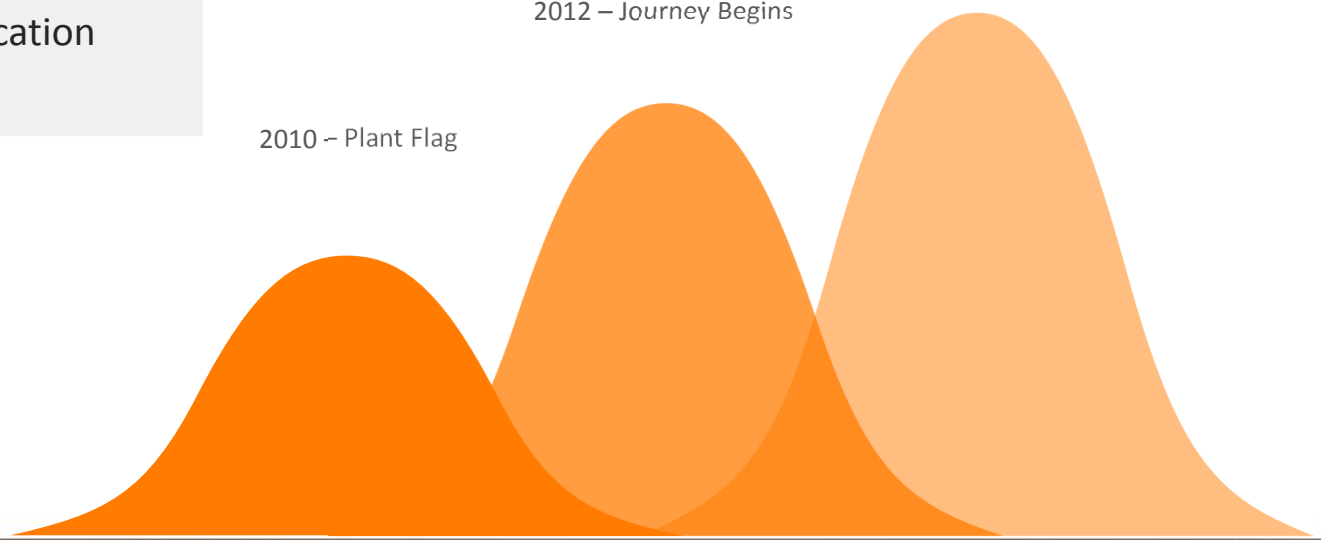
Sound Masking

Mass Notification

Meet Code and Standard

2012 – Journey Begins

2010 – Plant Flag



2018 BICSI Fall Conference & Exhibition





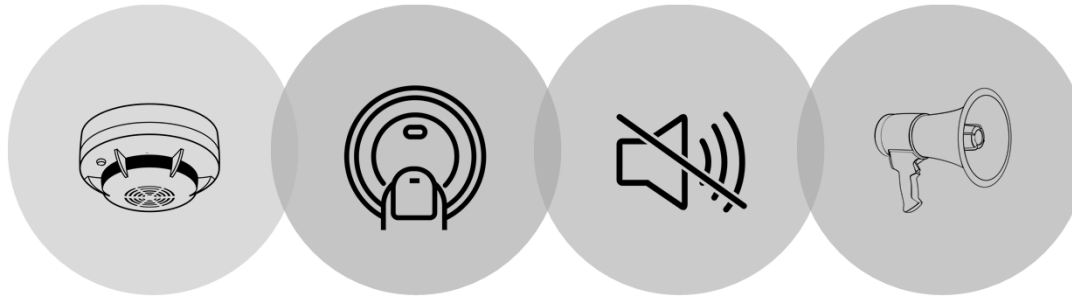
NEPA 725
Audio Distribution and its Impact on Safety



2018 BICSI Fall Conference & Exhibition



SEQUENCE FOR CODE



ALARM

TURN OFF

SILENCE

ANNOUNCEMENT



ONE AUTOMATIC
STEP TO MEET CODE



2018 BICSI Fall Conference & Exhibition



Bicsi



SYSTEM BUILD

AUDIO DISTRIBUTION AND ITS IMPACT ON SAFETY



2018 BICSI Fall Conference & Exhibition



Bicsi

CODE ADAPTION

Risk Mitigation

Best
Practice

Sustainable Ideas

Furthering
NFPA's Role

Importance and Future of Safe Buildings



2018 BICSI Fall Conference & Exhibition



Bicsi



LIFE SAVING

AUDIO DISTRIBUTION AND ITS IMPACT ON SAFETY



2018 BICSI Fall Conference & Exhibition



Bicsi

CODE BODY

Audio Distribution

Mute Masking

Mass Notification

Codes and Standards

(Can't Be a Code Body
if Standards Don't
Matter)



SYSTEM COMPONENTS



Headend



OP



Audio Interface



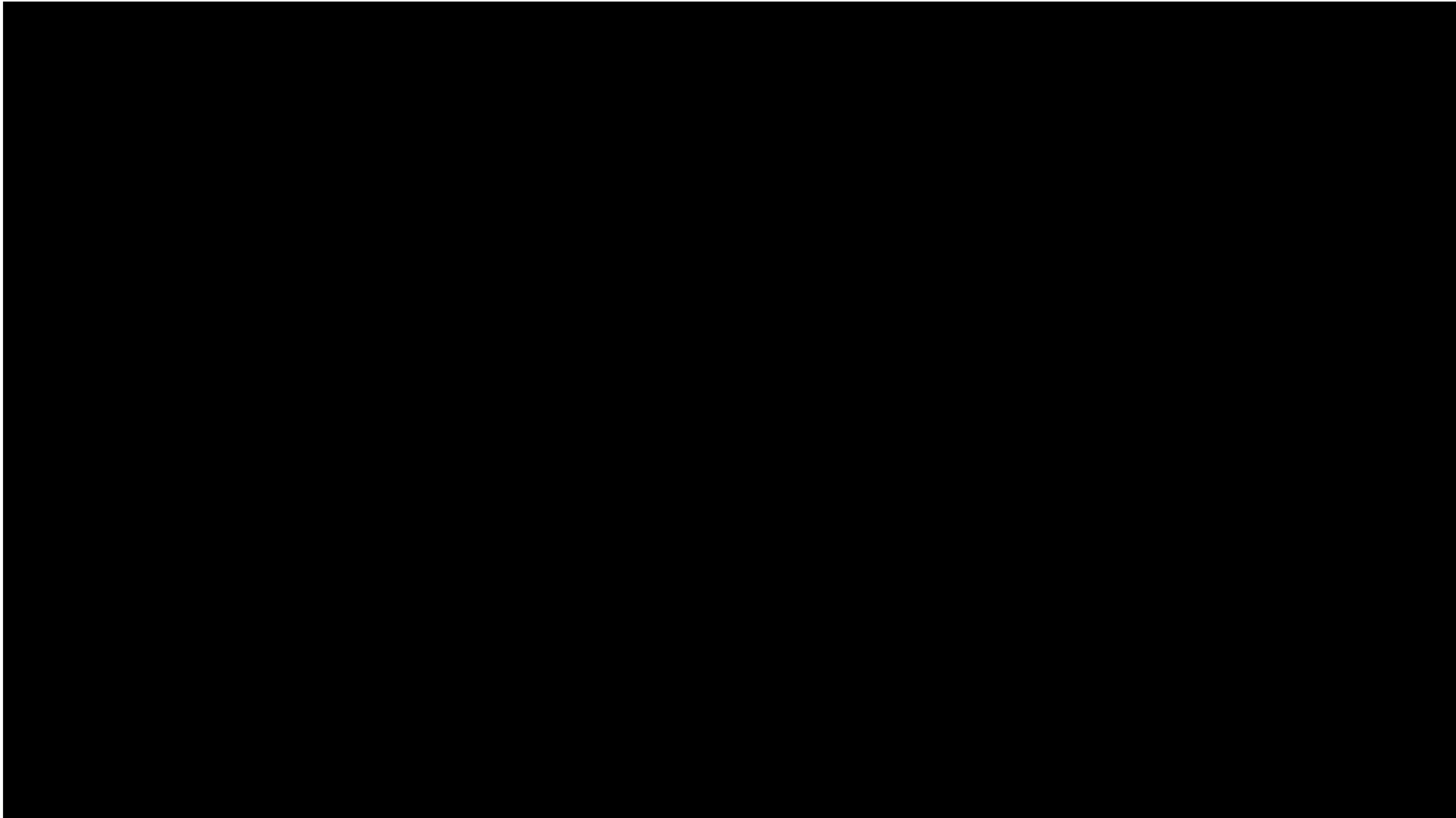
Field PoP



2018 BICSI Fall Conference & Exhibition



Bicsi



2018 BICSI Fall Conference & Exhibition



Bicsi

SYSTEM FEATURES



Q&A

PLEASE RAISE YOUR HANDS
FOR ANY QUESTIONS!



2018 BICSI Fall Conference & Exhibition



Bicsi