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R.P. SCHIFILITI ASSOCIATES, INC.
P.O. Box 297
Reading, MA 01867 - 0497
USA
781.944.9300 Fax / Data
781.942.7500 Telephone

Speech Intelligibility – The Engineering of Intelligent Communications

Presentation at the 2011 NFPA Conference & Expo
Session T09, Tuesday, 14 June 2011, 8:00 AM – 9:00 AM

The original T09 presentation was titled "*Emergency Message Intelligibility – A Review of Design Strategies in Achieving What is Required by Codes and Standards*". The presenter was unable to attend and Mr. Schifiliti was asked to present on the subject. The presentation given was based on a program prepared for NFPA as a "Web Extra" (now called NFPA Journal Live) follow-up to a Nov./Dec. 2010 article in the NFPA Journal titled "*Can you Hear (and Understand) Me Now?, 10 key issues affecting the intelligibility of voice communications*". The presentation is available on NFPA's web site to members as a video:

<http://www.nfpa.org/categoryjournal.asp?categoryID=1941>


Presenter:

Robert P. Schifiliti, P.E., FSFPE

President, R.P. Schifiliti Associates, Inc.
Chair of the Technical Correlating Committee on Signaling Systems for the Protection of Life and Property
info@rpsa-fire.com

Date: Tuesday 14 June 2011
Event: NFPA Conference & Expo, Session S40
Time: 1.0 hour – 8:00 AM – 9:00 AM
Format: Lecture

Speech Intelligibility – The Engineering of Intelligent Communications



A web presentation created for NFPA as a follow-up to a Nov./Dec. 2010 NFPA Journal article.

A video of the presentation is available on NFPA's web site for members to view.

Robert P. Schifiliti, P.E., FSPE
President,
R.P. Schifiliti Associates, Inc.
Reading, MA
rps@rpsa-fire.com

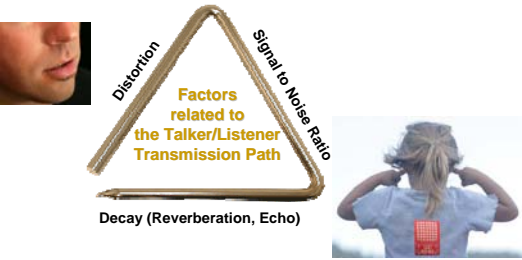
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R.P. Schifiliti Associates, Inc.
P.O. Box 207
Reading, MA 01867
USA
+1 781 944 9300 Fax
+1 781 944 7200 Voice
www.rpsa-fire.com

Agenda

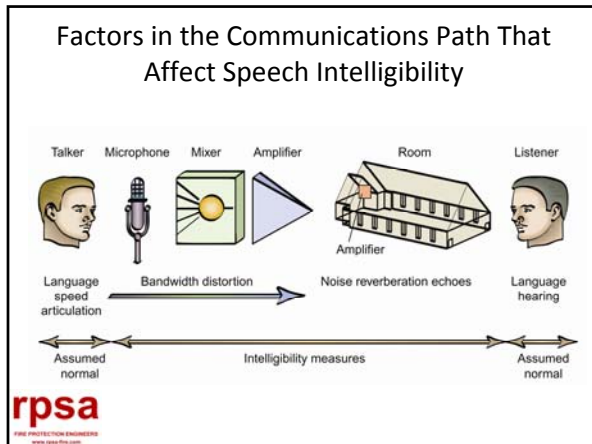
- Overview of voice intelligibility
- How to determine the spacing of speakers
- What should a voice message say?
- Question on other points from the article

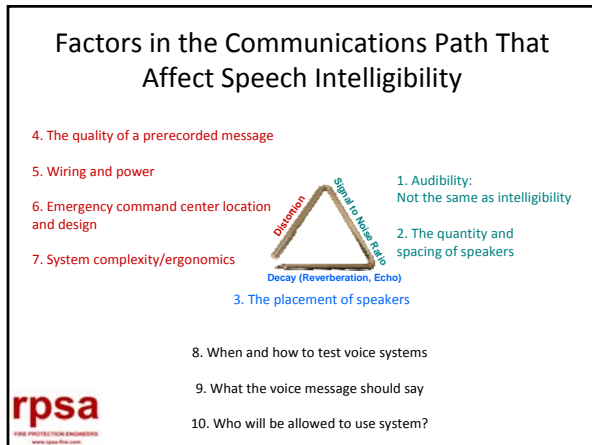
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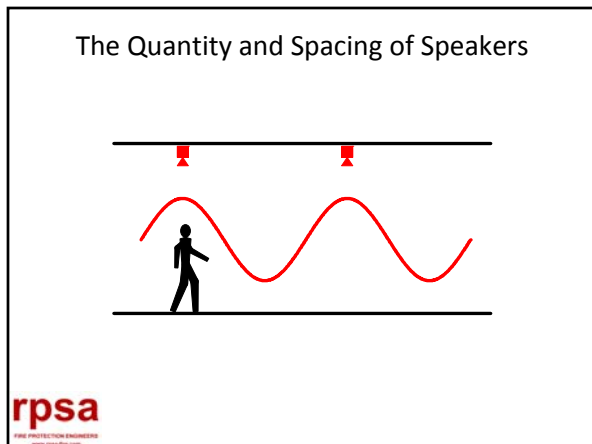
Factors in the Communications Path That Affect Speech Intelligibility

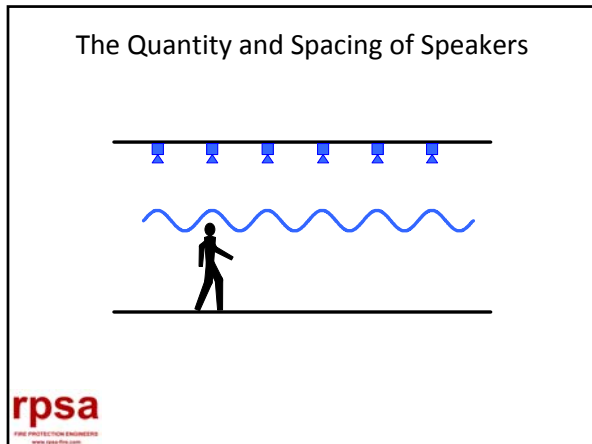


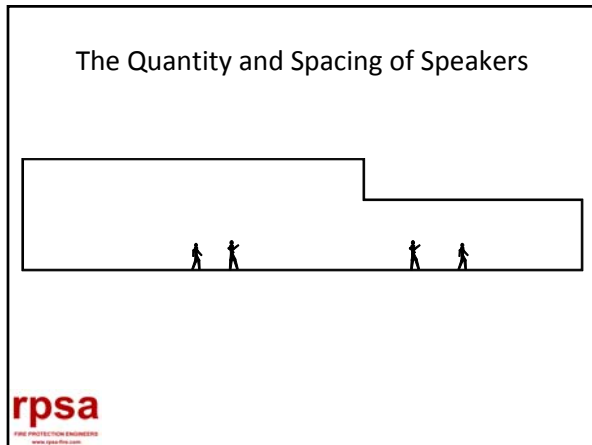
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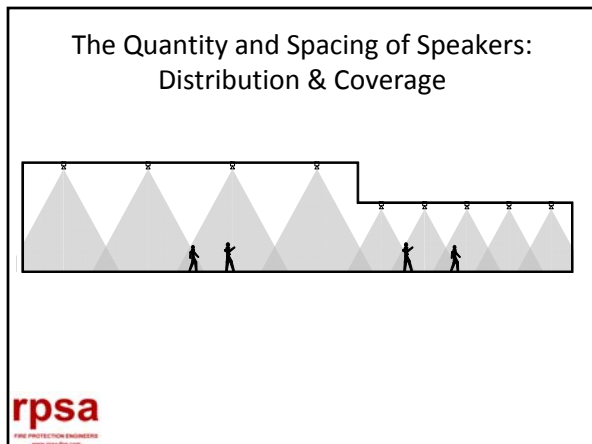


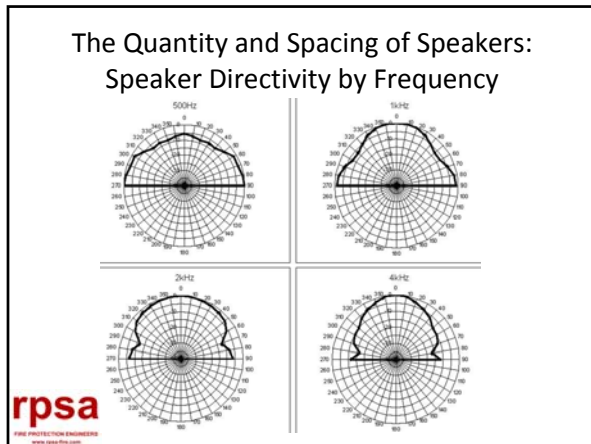


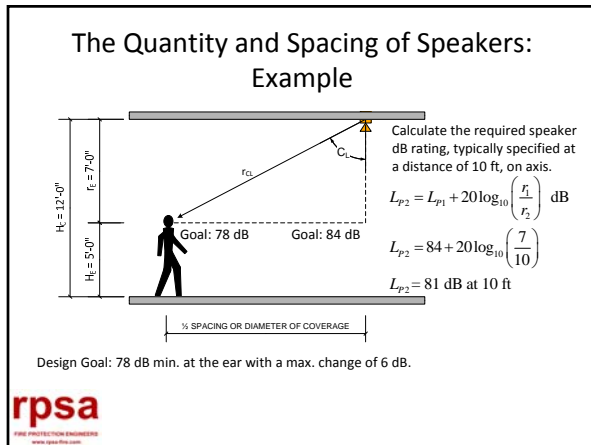


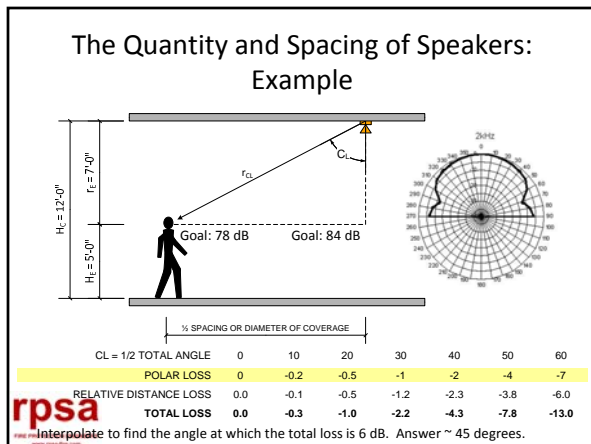


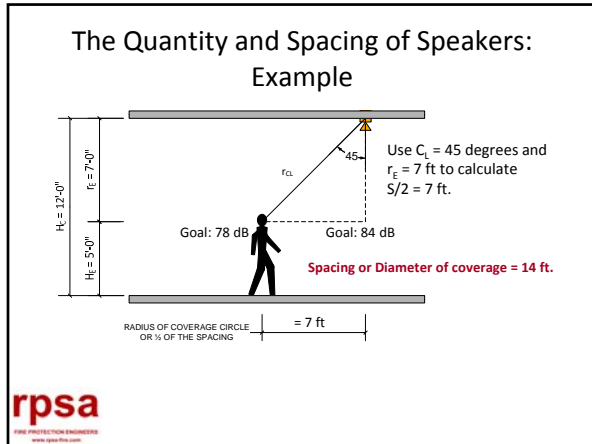


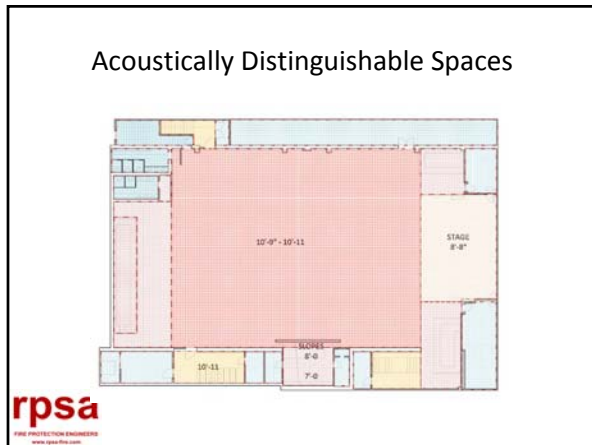


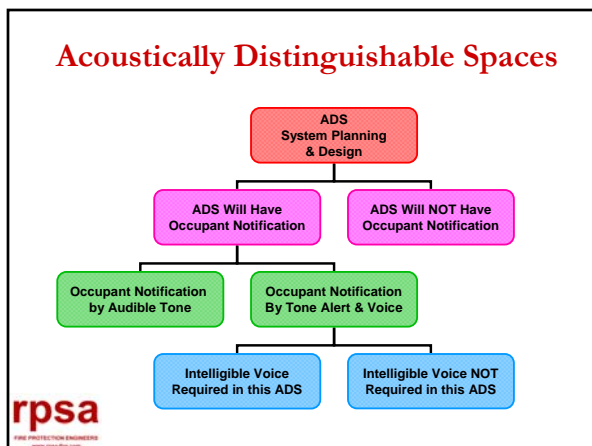












What are the evolutionary stages common to most crises?

Chandler's Six Stages of a Crisis

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Create Preplanned Messages and Message Templates

- For each stage, of each event, for each communications channel, for each target audience, for each desired action.

Example:
6 x 5 x 3 = 90 possible messages

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Effective Emergency Communications

- Message content
 - A description of the event or hazard: What is happening.
 - Location **27/9/3**
 - What to do **•27 WORDS**
 - When to do it **•9 SECONDS**
 - Why you should do it **•3 MESSAGES**
 - Source of information / authority

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**Create Preplanned Messages
and Message Templates**

- Avoid over- and under-loaded messages
- Start with the 27/9/3 rule
- CCO: Compassion, conviction, optimism
- AGL-4: Write for < 6th grade reading level
- Primacy / Recency
- Use graphics

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High Rise Fire Evacuation Message Map #1

Audience/Stakeholder: Occupants of Fire Floor, Floor Above and Floor Below

Stage of Crisis: ___ Warning ___ Risk Assessment Response ___ Management ___ Resolution ___ Recovery

Questions: What do you want people on these floors to do now?

Communications Channel(s): Emergency Voice Alarm Communications System to affected floors.

There is a fire on floor number 7.

- The fire is in an office.
- There is some smoke in the hallways and stairs.
-

Fire sprinklers have activated and the fire department is responding.

- The sprinklers will control the fire to allow safe evacuation of the area.
- The fire chief will make additional announcements when more information is available.
-

People on floors six, seven and eight must leave using the stairs.

- Occupants can go to other floors.
- It is not necessary to evacuate the building.
-

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**Speech Intelligibility – The
Engineering of Intelligent
Communications**


Resources:

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SB 50-2008, *Emergency Communications Audio Intelligibility Applications Guide*, www.nema.org

NFPA 72, Annex D

Robert P. Schifilitti, P.E., FSPE
President,
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R.P. Schifiliti Associates, Inc. provides state of the art fire prevention and protection, consulting and engineering services. Clients are building owners; management companies; hospitals; federal, state and local governments; insurance companies; colleges and universities; lawyers; architects; engineers; and system installers. Formed in 1988, our scope of business centers on four major client needs:

- Fire investigation and failure analysis of fire protection systems.
- Analysis of existing or proposed system performance.
- Fire protection and prevention educational seminars and programs.
- Planning and design of fire prevention and protection systems and Emergency Communications Systems.

The founder, Robert P. Schifiliti, has over thirty years experience in fire protection and prevention work. For thirty years he has specialized in fire detection, alarm and signaling systems. Mr. Schifiliti has a Master of Science degree and holds a Professional Engineer's license, both in Fire Protection Engineering. Recognized as an expert in the field of fire detection and alarm systems, Mr. Schifiliti has written and published extensively on the subject and has conducted numerous seminars and training classes. In 2008 his status, service and achievements in fire protection were recognized by the Society of Fire Protection Engineers and he was elevated to the grade of Fellow.

Typical projects include:

- **Reconstruction** and analysis of system performance during fires.
- **Management** of case documents and information using LexisNexis *CaseMap*, *TextMap* and *TimeMap* along with our *IQ File*[™] system.
- **Analysis** of an existing system's ability to meet specific goals or building codes.
- **Design** of fire detection, signaling and protection systems for commercial, industrial, institutional and residential occupancies.
- **Research** codes and provide detailed analysis of origin, intent and applicability.
- **Determination** of the cause and remedy of detection system false alarms.
- **Presentation** of educational programs for inspectors, plans reviewers, engineers, owners, managers and installers.
- **Measurement** of 1/3 octave band noise, voice system intelligibility and OSHA DOSE (noise) surveys. Noise analysis and designation of Acoustically Distinguishable Spaces per NFPA 72.
- **Assist** owners in developing comprehensive Emergency Plans and emergency communications strategies, including review and selection of Emergency Communications Systems.
- **Development** of performance based requirements and specifications for fire prevention and protection systems.
- **Review** plans and specifications. Provide comments on performance and code compliance.
- **Organize** and conduct independent reviews of equipment, contractors and vendors. Provide documentation of review and assist in the selection.
- **Evaluate** contractor and vendor submittals and shop drawings. Determine system's ability to meet intent of specifications, drawings and codes.
- **Set-up** and witness final tests and inspections of fire protection systems. Prepare system punch-lists and follow-up on task completions.