



ENSURING CLEAR COMMUNICATION:

THE ROLE OF SPEECH INTELLIGIBILITY IN LIFE SAFETY

In an emergency, clear voice communication can mean the difference between a safe evacuation and a chaotic response. Whether it's a fire, chemical spill, or another threat, people rely on voice systems for guidance. If messages are unclear or misunderstood, the consequences can be life-threatening. That's why speech intelligibility—the measure of how clearly speech is understood in a space—is an essential component of modern fire alarm and emergency communication systems.

Despite its importance, speech intelligibility is often overlooked during inspections and approvals. Regular testing isn't just a technical requirement; it's a public safety imperative. Backed by NFPA codes and supported by reliable tools like Bedrock's measurement systems, speech intelligibility testing should be a standard part of every life safety evaluation.

What Is Speech Intelligibility?

Speech intelligibility refers to the clarity and comprehensibility of spoken messages in a space—determining whether occupants understand emergency announcements. It's not just about hearing a message, but understanding it.

Background noise, reverberation, speaker placement, and system quality impact speech intelligibility. In an emergency, unclear or distorted messages can delay evacuations, increase panic, and lead to serious consequences.

Why It Must Be Measured

1. NFPA Compliance

NFPA 72 (2025), Annex D outlines how to measure and validate speech intelligibility in fire alarm and emergency communication systems. It requires at least 90% of measurement locations to have an STI of ≥ 0.45 (0.65 CIS) and an average STI of ≥ 0.50 (0.70 CIS). STI, ranging from 0 to 1, is the preferred metric for evaluating speech clarity, ensuring messages are understandable in emergencies.

2. Life Safety

Clear voice messages help people evacuate quickly and safely. Inaudible or unclear messages can delay egress and lead to misinterpretation—posing serious risks in schools, hospitals, airports, and other public spaces.

3. System Validation

Buildings change—walls go up, acoustics shift, and speakers age. Measuring intelligibility ensures the system continues to perform as originally designed, making it a vital part of ongoing maintenance.

4. Reduced Liability

Failed communication during emergencies often traces back to inadequate testing. Measuring intelligibility provides documented proof of compliance, supporting due diligence and lowering legal risk.

How to Measure Speech Intelligibility

SDi offers Bedrock Audio solutions that make speech intelligibility testing simple, accurate, and code-compliant. The Bedrock AM100 is a high-end Class 1 analyzer for professionals who need precision, wireless control, and integrated signal generation—all in a rugged, portable unit. For field use, the SM50 features an intuitive touchscreen, essential functions like STIPA and full STI testing, real-time analysis, and a durable hard case. Paired with either analyzer, the BTB65 Talkbox delivers calibrated STIPA signals that simulate human speech, enabling repeatable, valid tests across any voice evacuation system. These tools streamline testing without compromising accuracy or compliance.



Why Choose Bedrock for Intelligibility Testing

- **Accuracy** – Calibrated to international standards for reliable STI/CIS results that meet or exceed code.
- **Efficiency** – Rapid testing across zones with instant, easy-to-read results to reduce labor and simplify workflows.
- **Documentation** – Auto-generated reports support audits and occupancy approvals with minimal effort.
- **Risk Management** – Routine testing identifies issues like speaker failure or acoustic changes before they become safety hazards.

Speech intelligibility testing isn't just another box to check—it ensures emergency messages are heard and understood. With Bedrock tools, testing is simple, standardized, and effective, and should be part of commissioning, maintenance, and life safety inspections—because in an emergency, every word matters.