



Market Segment:  
**INDUSTRIAL**

Country of installation:  
**SLOVAKIA**

Year of Installation:  
**2024**

End customer:  
**Messer Slovnaft s.r.o.**

System Integrator:  
**Enterprise Solutions Slovakia s.r.o.**

Solutions:  
**Emergency communication, Intercom system**

Key Products:  
**TFIX-3-V2, IP Flush Master Station, CRM-V-2, Alphacom ICX, Multiconference, Voice Activity Detection (VAD)**

## Smart Audio Detection Transforms Refueling Safety

**Messer Slovnaft replaces manual monitoring with automated VAD technology, reducing dispatcher fatigue while enhancing critical incident response at hydrogen refueling stations**

### The Customer/End User

**Messer Slovnaft** is a member of the multinational Messer group, one of the world's largest producers of industrial gases.

Messer Slovnaft was established in 1992 as a joint venture between Messer Group and Slovnaft. Messer Slovnaft is engaged in the **production and purification of technical gases at the Slovnaft refinery.**

In Slovakia, they operate **four independent hydrogen refueling stations** within its facility, designed for filling vehicles used for the transportation of technical gases. In such a high-risk environment, **being able to hear, be heard, and be understood at all times is not a luxury: it's a necessity.**

### The Requirement

Refueling operations present inherent safety risks where rapid detection of critical situations is vital for protecting personnel and assets. Messer Slovnaft faced two primary challenges in maintaining operational safety at their refueling facilities. First, their existing audio monitoring system was outdated and entirely manual, requiring constant human oversight to detect increased ambient noise—a key indicator of potential hazardous conditions. This reactive approach left critical gaps in safety monitoring.

Second, the refueling environment is classified as explosion-hazardous due to explosive gas presence, demanding specialized safety-certified equipment that could operate reliably in these extreme conditions.

Messer Slovnaft required an intelligent solution capable of autonomous critical sound detection while maintaining clear real-time voice communication, even in acoustically challenging environments.

## The Solution

The technical solution centers on automated ambient noise monitoring—a key indicator of potential critical situations at refueling stations. Zenitel's ICX-AlphaCom platform provides the foundation for this intelligent detection system.

### Automated Noise Detection

Explosion-proof TFX-3-V2 intercom stations were installed at each hydrogen refueling point to monitor ambient noise levels using Voice Activity Detection (VAD) functionality. The system triggers only when predefined noise thresholds are exceeded and sustained for configured durations, ensuring reliable detection while minimizing false alerts.

### Multi-Station Communication

The solution operates in multi-conference mode, enabling simultaneous information transmission from multiple stations. The control room's IP Flush Master

intercom was selected for its technical characteristics ideal for dispatch environments, automatically opening voice channels between dispatchers and relevant refueling stations when threshold parameters are met.

### Flexible Operational Control

Active voice channels are visually indicated on the dispatcher station for enhanced situational awareness. During expected noise increases such as maintenance activities, dispatchers can temporarily deactivate VAD at specific stations using pre-programmed buttons, providing operational flexibility while reducing false alerts.

## The Result

The Zenitel ICX-AlphaCom solution delivers significant operational improvements across safety, efficiency, and workplace comfort. The system replaces a problematic analog setup that continuously transmitted all refueling station audio to control room loudspeakers, forcing dispatchers to endure constant

exposure to hissing valves, background noise, and routine conversations throughout their shifts.

### Enhanced Dispatcher Experience

The intelligent VAD-based system eliminates continuous audio exposure, dramatically reducing cognitive load and dispatcher fatigue. Event-driven alerts ensure dispatchers receive only relevant information when sound thresholds indicate potential critical situations, vastly improving workplace comfort and focus.

### Operational Efficiency Gains

Response times have shortened significantly through automated detection and instant voice channel establishment. The temporary deactivation feature reduces false alarms and associated costs while maintaining system reliability during planned activities like maintenance.

### Improved Safety Outcomes

The solution transforms previously disruptive acoustic monitoring into a modern, high-value information system. Enhanced situational awareness, reduced response times, and intelligent filtering of critical versus routine sounds create a more effective safety monitoring environment that better protects personnel and assets.



## Why Zenitel?

Zenitel is well positioned to drive the future of intelligent critical communication solutions. Through our portfolio of IP products and solutions, with built-in intelligence and a focus on cybersecurity, we provide organisations with superior, scalable security and flexibility. Zenitel is the proven, preferred choice for environments requiring crystal-clear audio to ensure the protection of human life, property, assets and the management of critical activities. With interoperability at all levels, we seamlessly integrate with access control, video management and security platforms-