ENHANCING
FIREGROUND SAFETY AND OPERATIONS

A CLOSER LOOK AT THE CHALLENGES FACED BY FIRE & RESCUE SERVICES (FRS)

MOTOROLA SOLUTIONS

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WHAT IS FIREGROUND?

IN THE CONTEXT OF FIREFIGHTING AND EMERGENCY RESPONSE, THE TERM 'FIREGROUND' REFERS TO THE IMMEDIATE AREA SURROUNDING AN INCIDENT SITE WHERE FIREFIGHTERS AND RESCUE PERSONNEL ARE ACTIVELY ENGAGED IN CONTROLLING AND EXTINGUISHING A FIRE OR MANAGING AN EMERGENCY.

On the fireground, every second counts. It is a dynamic, time-compressed and complex environment with varying degrees of uncertainty and chaos, placing information at a premium.

At Motorola Solutions, we understand how challenging it can be to navigate such complex situations and know that every fire scene requires three priorities to be addressed: life safety (both firefighter and civilian), incident stabilisation and property conservation[1].

The FRS is a crucial service for the public and to enhance fireground safety, we've created bespoke and innovative solutions.

CHALLENGES WITHIN THE INDUSTRY

THE BRAVE MEN AND WOMEN WHO WORK WITHIN THE UK FIRE AND RESCUE SERVICES FACE A HUGE NUMBER OF CHALLENGES WHEN ATTENDING AN INCIDENT. OUTSIDE OF THE INHERENT DANGERS INVOLVED WITH TACKLING FIRES AND OTHER EMERGENCIES, YOUR WORKERS HAVE SO MUCH MORE TO THINK ABOUT.

From the moment a call comes in, FRS teams need to respond as quickly as possible, which can be especially difficult in densely populated urban areas or remote locations. Fire services must also accurately assess the situation so that they can deploy the appropriate personnel and resources.

As we have recently seen across Europe, climate change can lead to more frequent and intense weather events, including wildfires and floods, which place additional strain on fire and rescue services.

Firefighters and rescue personnel face significant risks while operating on the fireground. They are exposed to hazardous conditions, such as flames, smoke, toxic fumes, collapsing structures and extreme temperatures, which can lead to injuries or fatalities.

Through all this, ensuring the safety of the public during an incident is a top priority. Evacuating occupants from affected buildings and managing crowds in emergency situations can be difficult, especially in high-rise buildings or densely populated areas.

Addressing these challenges requires continuous training, investment in equipment and technology and a strong focus on firefighter safety. Collaborative efforts between fire and rescue services, research institutions and relevant authorities can also contribute to finding innovative solutions for managing fireground challenges effectively.

Effective fireground communications are crucial to the work of fire and rescue services in resolving incidents and ensuring firefighter safety, particularly between sectors and when breathing apparatus (BA) crews are deployed. The interoperability of communications between services at cross-border and major incidents can also be critical to effective operations[2].

CUSTOMER CHALLENGE 1:
EFFECTIVE FIREGROUND COMMUNICATIONS

ONCE FRS PERSONNEL HAVE BEEN DEPLOYED TO THE FIREGROUND, CLEAR AND RELIABLE COMMUNICATION BECOMES ESSENTIAL. COMMANDERS NEED TO RELAY TACTICAL INSTRUCTIONS TO FIREFIGHTERS, ENSURING THEY WORK COHESIVELY TO CONTAIN AND EXTINGUISH THE FIRE. THOSE ON THE FIREGROUND NEED TO BE IN CONSTANT CONTACT WITH EACH OTHER AND COMMANDERS TO PROVIDE UPDATES ON RESCUE OPERATIONS AS WELL AS VITAL SAFETY INFORMATION SUCH AS POTENTIAL HAZARDS OR COMPROMISED STRUCTURAL ELEMENTS.

In such dangerous environments, firefighters and members of the public could find themselves trapped, injured or disoriented. This is where 'mayday' calls and evacuation orders become potentially life-saving forms of communication.

But the fireground - particularly if it is inside a building - can be a very difficult environment to communicate in. Buildings with thick walls, metal structures, or reinforced concrete can hinder radio signals, leading to reduced coverage and dead zones, where communication becomes unreliable or unavailable. Firefighters may move through large buildings or encounter high-rise structures, and radio signals may not cover the entire area, leading to communication gaps.

In urban areas, there may be radio frequency interference from other electronic devices, radio systems, or even nearby radio users, which can disrupt clear communication.

Additionally, incident sites can be noisy, with sirens, alarms and machinery adding to the background noise. These can also interfere with clear radio communication.

BOOST IN-BUILDING
COVERAGE WITH MOTOTRBO™

The MOTOTRBO R7 is a digital two-way radio Motorola Solutions designed to address many of the challenges faced by firefighters. It offers several features and technologies that help improve in-building coverage and ensure reliable communication:

DIGITAL TECHNOLOGY

MOTOTRBO uses digital modulation, which provides clearer audio and improved coverage compared to analogue systems. Digital signals are less susceptible to interference and can penetrate buildings more effectively.

DUAL CAPACITY DIRECT MODE (DCDM)

DCDM allows direct communication between two MOTOTRBO radios without the need for a repeater, making it suitable for scenarios where infrastructure is limited.

INDUSTRY LEADING RECEIVER SENSITIVITY

The MOTOTRBO R7 has a low receiver sensitivity level which improves range performance for better coverage in field.

NS750 IMPRES™ REMOTE SPEAKER MICROPHONE (RSM)

LARGE, TEXTURED, FRONT AND SIDE PUSH-TO TALK BUTTONS

In high stress situations, communication with the NS750 is seamless. The device has both a traditional push-to-talk (PTT) button on the side as well as a large and textured front-facing PTT button. Easy to use whilst wearing gloves, this prevents fumbling with the device so you can deliver key information quickly.

INTELLIGENT AUDIO: YOUR CALLS, ALWAYS AT THE PERFECT VOLUME

Set your volume once and depend on your accessory to listen for changes in background noise, adjusting the volume automatically.

SMART AUDIO SWITCHING

The NS750's Smart Audio Switching functionality maintains the communication lifeline when firefighters are dispatched or during rest break. It provides the ability to switch from RSM to breathing apparatus (BA) communication kit whilst keeping the connection secure for improved efficiency and peace of mind.

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MOTOTRBO
R7

DURABLE DESIGN

MOTOTRBO R7 is built to outperform whatever is thrown its way. Tested to meet military standards (IP68 and IP66), the device can withstand the impact of high pressure water jets from any angle and features a ruggedised screen which is resilient against knocks and drops in the field. The R7 radio also resists disinfection and decontamination substances[1] to ensure the radio can be kept clean and free from harmful carcinogens and pollutants.

LOUD & CLEAR

Providing next-level noise cancellation, loudness and clarity, MOTOTRBO R7 excels where audio communications can be challenging, so your team can hear and be heard anywhere you operate – even in the noisiest fireground environments.

EASY INTEGRATION

R7 is fully compatible with all MOTOTRBO systems so you can expand communication coverage and future proof your investment. This includes DP4000 series IMPRES chargers, so whether you charge in-vehicle or on station, you can ensure your device is always ready.

CUSTOMER CHALLENGE 2:
ENHANCING FIREFIGHTER SAFETY

A HAZARDOUS FIREFIGHTING SCENARIO REQUIRES THE USE OF BREATHING APPARATUS AND ATEX (ATMOSPHERES EXPLOSIBLES) RADIOS. WHEN A FIRE INVOLVING FLAMMABLE OR EXPLOSIVE SUBSTANCES IS IN A CONFINED SPACE, THIS CAN PRESENT SERIOUS RISKS TO FIREFIGHTERS DUE TO TOXIC SMOKE, REDUCED OXYGEN LEVELS, AND EXPLOSIONS.

The Dangerous Substances and Explosive Atmospheres Regulations of 2002 (DSEAR) say that where a dangerous substance is, or is liable to be, present at the workplace, employers must make a suitable and sufficient assessment of the risks to their employees.

In the DSEAR, an explosive atmosphere is defined as a mixture of dangerous substances with air under atmospheric conditions in the form of gases, vapours, mist or dust which, after ignition has occurred, combustion spreads to the entire unburned mixture.

For Fire and Rescue Services, the recommended standard for general applications where an explosive atmosphere is likely to occur in normal operation is ATEX Zone 1 (gas), or Zone 21 in the case of combustible dusts[3].

By using ATEX radios, firefighters can maintain essential communication while mitigating the risk of causing further hazards during their operations. These radios are essential for coordinating efforts between firefighters and incident commanders, allowing them to work effectively and safely in challenging and dangerous environments.

Plus, with the intrinsically safe IP67 IMPRES ATEX RSM, you can connect to the breathing apparatus communication unit to provide extra loud audio capabilities in hazardous environments.

In hazardous firefighting scenarios involving flammable or explosive substances, the use of breathing apparatus and ATEX radios is crucial for ensuring the safety of firefighters and a successful response to the incident. Proper training, adherence to safety protocols and the use of appropriate equipment are vital to minimise risks and protect the lives of both firefighters and potential victims.

SAFE SOLUTIONS

ATEX DP4401Ex AND DP4801Ex RADIOS

MOTOROLA'S MOTOTRBO DP4000 Ex SERIES ATEX RADIOS PROVIDE HIGH QUALITY COMMUNICATION WITH COMPREHENSIVE USER SAFETY AND CLASS LEADING ATEX SPECIFICATIONS FOR USE IN ENVIRONMENTS THAT CONTAIN POTENTIALLY EXPLOSIVE GAS AND DUST.

Unlike other suppliers, our ATEX radios meet the National Fire Chiefs Council (NFCC) guidance of 'IIC' certification[4] the highest possible ATEX certification standard. This means they are intrinsically safe in potentially explosive atmospheres, preventing the risk of igniting flammable gases or vapours. The radios are also heat resistant to withstand close proximity to fire.

MOTOTRBO RADIO MANAGEMENT AND OTAP (OVER-THE-AIR-PROGRAMMING)

Our radio management software helps you align with recommended updates from the NFCC and actions the latest firmware updates for security enhancement. Plus with OTAP you can set up and deploy radios quickly for a faster response time.

CUSTOMER CHALLENGE 3:
PROTECTION & ACCOUNTABILITY

FRS PERSONNEL ARE INCREASINGLY FACED WITH VIOLENCE AND THREATS OF AGGRESSION FROM THE GENERAL PUBLIC WHILST ATTENDING INCIDENTS. THIS NOT ONLY PUTS THEIR SAFETY AT RISK, BUT ALSO IMPEDES AND INTERFERES WITH RESCUE OPERATIONS.

There is a growing culture of attacks on firefighters, including both verbal and physical abuse. 983 attacks on firefighters were reported last year - a 5% increase on the previous year[5] - with some of these described as pre-planned ambushes where bricks and bottles were thrown or access roads have been purposely blocked.

Body-worn video cameras can be valuable tools for Fire and Rescue Services to protect themselves against verbal and physical abuse from the public during incidents. These can be adorned during non-fire incidents or by those situated around the perimeter of an incident to help enhance operational efficiency, firefighter safety, and public accountability.

The use of body-worn cameras can act as a deterrent against abusive behaviour from the public. Knowing that their actions are being recorded can discourage individuals from engaging in aggressive or abusive behaviour towards firefighters. This can de-escalate potentially volatile situations, as people may be more inclined to cooperate and communicate calmly when they know their behaviour is being documented.

This also creates accountability, as body-worn cameras provide an objective and unbiased record of the interactions between firefighters and members of the public. In case of any allegations of verbal or physical abuse, the camera footage can serve as evidence to accurately assess the situation and determine the facts.

Recorded footage can be used for training purposes and for process improvements. Firefighters can learn from past incidents, assess their response to challenging situations and identify ways to improve their communication and conflict resolution skills.

In the event of false accusations or legal claims, body-worn camera footage can serve as valuable evidence to defend firefighters against unfounded allegations.

Body-worn cameras can be an important tool in preventing fires too. FRS teams regularly conduct fire safety audits at places that house vulnerable people such as nursing homes, and their cameras are used to collect evidence of how well protected these buildings are against fire.

When used responsibly, body-worn cameras can be valuable tools for fire and rescue services to improve their operations, protect their personnel, and maintain public trust.

> **ATTACKS ON OUR FIREFIGHTERS ARE COMPLETELY UNACCEPTABLE.**
> **THIS TYPE OF BEHAVIOUR PREVENTS OUR CREWS FROM BRINGING ANY EMERGENCY TO A SAFE AND SWIFT CONCLUSION.**
>
> **ASSISTANT CHIEF OFFICER, STUART STEVENS - SCOTTISH FIRE AND RESCUE SERVICE**

VB400 BODY WORN VIDEO CAMERA

THE VB400 ENABLES YOU TO FOSTER TRUST BETWEEN YOUR TEAM AND THE PUBLIC BY PROVIDING AN UNBIASED INDEPENDENT WITNESS. IN THE FIELD, FEATURES INCLUDING DUAL MICROPHONES, A WIDE-ANGLE LENS AND INTUITIVE BUTTONS ENSURE THAT EVERY INTERACTION CAN BE CAPTURED IN HIGH-DEFINITION FROM START TO FINISH.

The camera allows for 12 hours of continuous recording on a single charge and with a robust exterior that is certified to MIL-STD-810G drop test requirements, it can withstand the rigours of the fireground.

The VB400 integrates seamlessly with MOTOTRBO technology you might already be using, meaning you don't need to worry about overhauling your communications and safety systems.
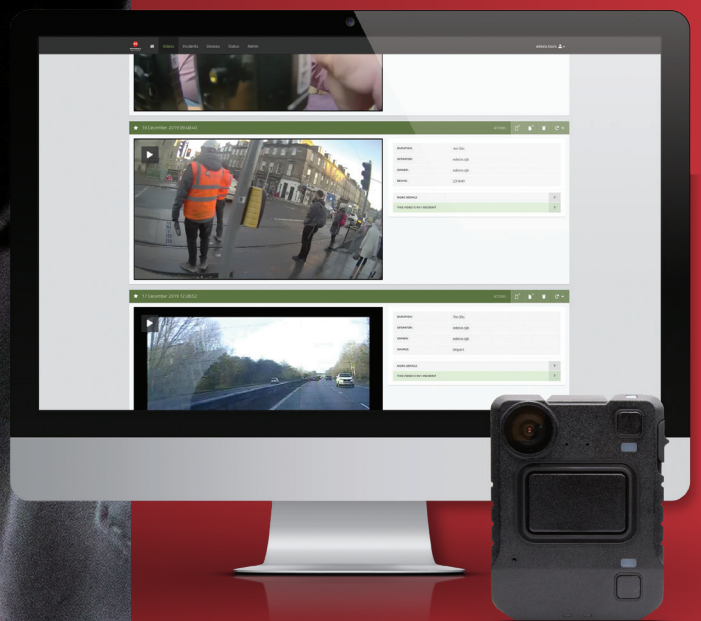
CREATING
A SAFER FRS

On the fireground, where every single decision matters, team collaboration and connection is essential. It allows FRS personnel to respond to and resolve emergencies more effectively and efficiently, keeping the public safe in the process. Motorola Solutions offers a fireground solution that is designed to reinforce safety, resilience and response, enabling our customers to be their best **in the moments that matter.**

Learn more about our products and services here: **motorolasolutions.com**

[1] https://www.fireengineering.com/leadership/early-fireground-decisions-determine-operational-success/

[2] https://www.ukfrs.com/foundation-knowledge/fireground-radios-guidance?bundle=section&id=19524

[3] http://ukfrs.com/foundation-knowledge/fireground-radios-guidance?bundle=section&id=19535

[4] https://www.ukfrs.com/foundation-knowledge/fireground-radios-guidance

[5] https://www.gov.uk/government/statistical-data-sets/fire-statistics-data-tables#response-times

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