



GOING BEYOND RADIO WITH MOTOROLA SOLUTIONS

COMMUNICATIONS SOLUTIONS TO IMPROVE WORKER SAFETY,
EFFICIENCY AND PRODUCTION



MOTOROLA SOLUTIONS



When it comes to worker safety, efficiency and production, nothing is faster than right now. Organizations across various energy segments — oil, gas, petrochemical, electric utilities, water utilities and mining — are currently juggling a mix of communications solution devices and are hindered by gaps in coverage, poor battery life and fragile equipment that cannot withstand harsh environmental conditions. The power of now puts instant communications at your workers' fingertips — because when communication slows, operation slows.

Citizens rely on their homes being heated in the winter, clean running water and lights that turn on when they flip the switch. Meeting these expectations requires reliable, clear voice and data communications for energy workers day-in and day-out. So workers can communicate safely in hazardous environments. So precious resources are not wasted and efficient operations are maintained. So energy companies can continue to exceed expectations.

Unified communications improves worker safety, efficiency and production for various types of energy companies today - but which solutions are right for your specific priorities and needs?

This guide will help you choose the solutions that are right for your company. With a custom unified communications solution designed around your business, you'll have the power to eliminate the barriers between devices, networks and locations.

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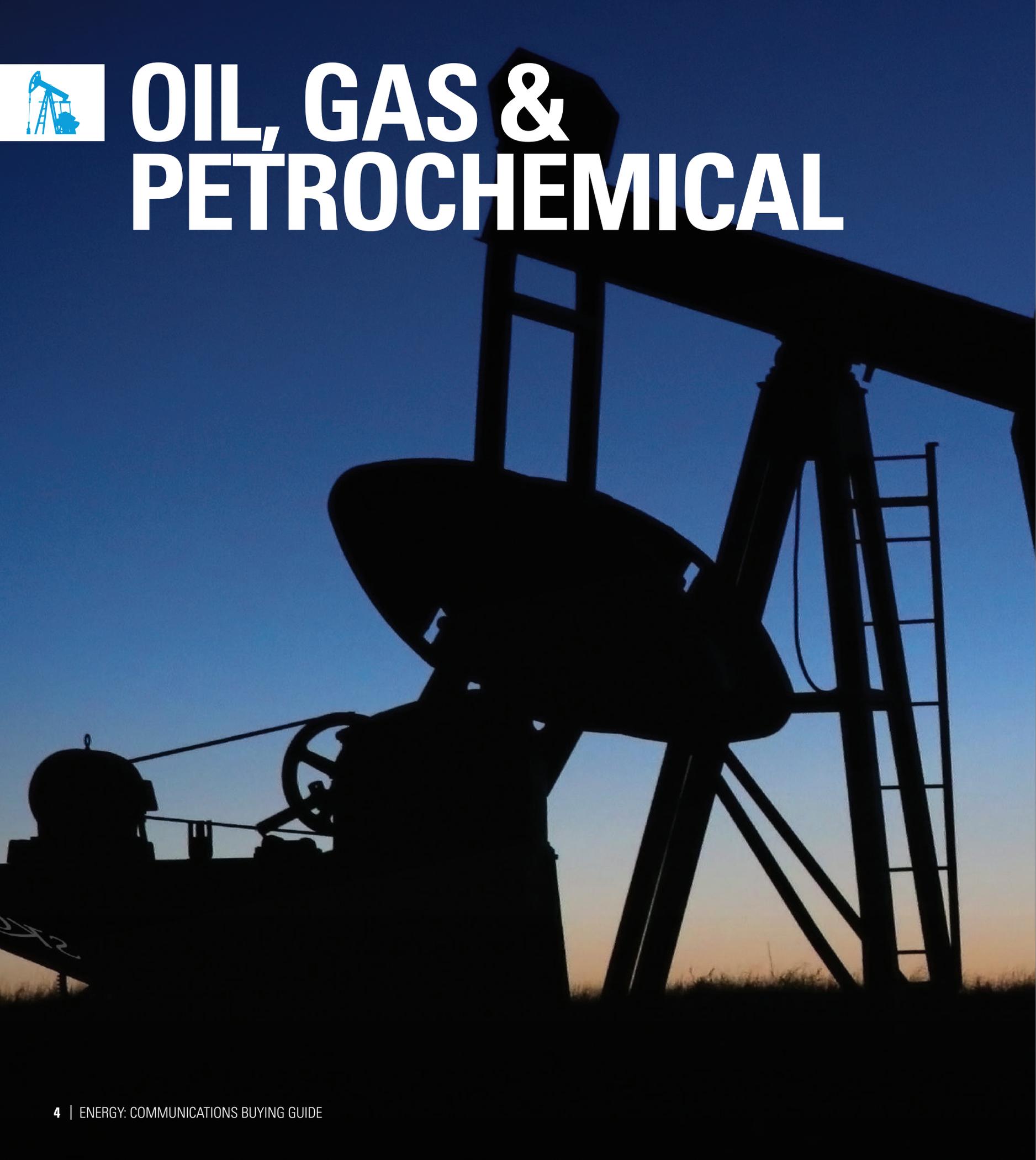
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OIL, GAS & PETROCHEMICAL





FUEL INTELLIGENCE-DRIVEN COMMUNICATIONS

From the oil rig, to offshore platforms and everywhere in between, having mission critical technology is a crucial first step towards increasing safety and operational efficiency. Our oil and gas communications solution set helps drive better and faster decisions that can make all the difference. Our in-depth portfolio provides critical communications for customers worldwide. Reliable, resilient and secure, they perform exactly when it matters – in everyday operations and unthinkable disasters.



SOLUTION SET



COMMUNICATE WITH ADDED INTELLIGENCE

AVIGILON

Self-Learning Video Analytics and AI-Powered Security Solutions

You can't be everywhere all the time—our self-learning video analytics solutions can monitor an area 24/7/365. They are designed to accurately recognize the movement of people and vehicles, differentiating it from motion that is not relevant to a scene. Their ability to constantly learn helps reduce false positives and ensure meaningful alerts.

Our video surveillance, cloud and access control solutions are integrated with AI to help provide the right information at the right time—so you can take decisive action. Designed to solve real-world challenges and change the way you interact with your surveillance system, our solutions help you detect, verify and act on critical events.



ALLY

Streamline Security Incident Management and Communications

When you're doing security checks, you don't have time to sift through disorganized data, especially if it's stored in multiple locations: software apps, spreadsheets, documents, or even physical files. Instead, make better use of the information you collect and simplify your security operations with one, easy-to-use platform that provides quick access to complete and accurate data throughout your entire organization.

Ally is a single platform where you can capture incident information in real time across multiple devices, analyze incident trends using easy, built-in reports, and act on improved insights for more proactive security planning.



MC-EDGE INTELLIGENT GATEWAY

Smarter, More Secure IoT

Whether daily operations, a natural disaster or man-made emergency, our mission-critical IoT products and solutions are always on, providing a new level of connectivity, automation and security.

Edge gateway is P25, LTE and LoRa ready, capable of handling inputs from hundreds of low-power wireless sensors up to 10 km. And with extensive security and ultra-reliable communication capabilities, MC-Edge makes it easy to implement, support and grow your IoT systems to fully support all your mission-critical operations.

This intelligent gateway protects your sensitive data from cyber attacks with end-to-end encryption. Full authentication, bulletproof access control and digital signatures keep your information safe.



SIREN SOLUTIONS

Community Safety and Alerting

Keep communities safe with reliable, secure, event-specific emergency notification systems. Our siren alerting capabilities enable operators and system maintenance personnel to proactively manage mass notification and emergency alert systems over a mission critical network.

LTE BROADBAND

Intelligence Advantage

With the overwhelming amount of data flooding through the oil and gas value chain, there is an increasing need for a highly reliable broadband network that is able to support extreme amounts of data transfer over large, isolated areas. LTE high-speed broadband networks extend broadband data capacity to remote sites such as metering stations and well sites in which real-time monitoring and communication are imperative. Process automation enabled through LTE networks, together with LMR and SCADA RTUs, help reduce the amount of manpower required to reliably collect and transmit information from remote locations.



SOLUTION SET



SYSTEMS

ASTRO (P25) System

The ASTRO® 25 platform is designed to give you maximum flexibility and scalability. From a single site to multisite to statewide, ASTRO 25 software-defined platform gives you the flexibility to grow the system as your needs expand. Advanced digital systems like ASTRO 25 support your everyday and emergency operations. They integrate voice and data in a P25 standards-based, mission-critical communication network. You can seamlessly interoperate with numerous agencies and streamline response the moment it's needed.

RADIOS

APX 6000

The single-band APX 6000 P25 portable radio delivers legendary APX ruggedness and reliability, without compromising on the form factor or features required for daily activities and extreme emergencies. Designed for the skilled professional who requires maximum protection with an Intrinsically Safe radio. Now, we are evolving the APX 6000 to support newer technologies like WiFi, Adaptive Audio Engine and Bluetooth® 4.0 wireless technology. These advances help improve the operational efficiency and response time while enhancing the safety of personnel and communities.



Unified communications means you can now equip your staff with the capability to communicate well beyond voice. Enhance productivity by connecting your radio network with your text and email system.



 **COMMUNICATE
INSTANTLY**

ACCESSORIES



**IMPRES 4300 mAh Li-Ion
Intrinsic Safe Battery**
IMPRES Lithium-ion (Li-ion) 4300
mAh Intrinsic Safe Battery,
Rugged IP68 for APX and SRX
Series Radios.



IMPRES Remote Speaker Microphone
This submersible remote speaker
microphone features Windporting,
emergency and programmable
buttons, making it ideal for the most
adverse conditions.

Heavy-duty Headsets

Motorola heavy-duty headsets include a variety of solutions to meet your needs for high-clarity, hands-free, discreet two-way communication. EP7 Sonic Defenders Ultra

These comfortable foam-tipped earplugs, work with surveillance kits and provide up to 28 dB hearing protection.
Temple Transducer

Receive and transmit audio with bone conduction technology with the Rugged Temple Transducer, ideal for tactical environments. Designed for APX Display Remote Speaker Microphones.



SOLUTION SET



COMMUNICATE
WITHOUT BOUNDARIES

WAVE

WAVE Push-to-Talk Application

Leverage the resources you already have to communicate with personnel on their own devices. WAVE extends your radio's reach to those who may not carry radios. Now the field supervisor away on business or the IT director outside the petrochemical plant can talk on their smartphones with radio users. WAVE connects to virtually any device – smartphones, laptops, tablets, landlines and more – on any public or private mobile data network, including Wi-Fi. You get seamless and secure connectivity, affordable Push-To-Talk (PTT), and the freedom to keep service plans and devices.



LEX L11 Mission-Critical LTE Device

The Android-based LEX L11 offers the touchscreen usability and convenience of a smartphone, but ruggedized and optimized for push-to-talk operation. Tested to military specifications, the LEX L11 offers very loud audio to enable PTT conversations even in noisy environments. Even the device holster is physically designed to route audio transmissions to the user's ear. Featuring two programmable side buttons, and an emergency button, the LEX L11 quickly connects your staff to resolve issues.



TLK 100 WAVE Two-Way Radio

For personnel that prefer a simplified and voice-optimized design, the TLK 100 WAVE Two-Way Radio delivers distraction-free voice communications across the country on our nationwide WAVE 4G Broadband network. Perfect for multi-site or multi-state entities, the TLK 100 connects your team with the push of a button no matter where they are.



**COMMUNICATE
WITH CONFIDENCE**

MANAGED & SUPPORT SERVICES

As technology advances, so does the complexity of your devices, networks and security needs. Supporting your communications doesn't have to be a burden - we can manage the complexity for you. Focus on your operations with the peace of mind that your communications are in experienced hands.



ASTRO Infrastructure Services

Your network. Our expertise. From network monitoring to software updates, partner with us to ensure availability and that your system performance goals are achieved.



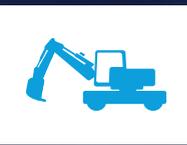
APX Device Management Services

Managing your two-way radio fleet doesn't have to be time-consuming or costly. With APX Device Management Services, choose the right level of service for your operations - so you can be supported for more efficient radio management or transfer the day-to-day accountability to us.



Cybersecurity Services

To protect your critical infrastructure from cyber threats, you need a multifaceted approach to cybersecurity. Protect your communications investment with a comprehensive plan today, because it's not a matter of if you'll be hacked - but when.



MINING



UNEARTH THE LATEST IN MINING SOLUTIONS

Drive the performance of your mining operations with resilient, reliable and unified communications. You'll gain instant access to information, greater control of operations and more efficient use of critical resources - in the field, underground and for the entire mine.





SOLUTION SET



COMMUNICATE INSTANTLY

SYSTEMS

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RADIOS

APX 6000 XE

APX 6000XE P25 two-way portable radio has met companies most demanding performance expectations. It delivers trusted performance in a single-band solution without compromising on the extreme form factor or features that are required for routine activities and emergencies. Now, as the ever increasing needs of personnel grow, we evolved the APX 6000XE to support new technologies like WiFi, Adaptive Audio Engine and Bluetooth® 4.0 wireless technology.



Unified communications means you can now equip your mining personnel with the capability to communicate well beyond voice. Safety focused features like Man-Down and Lone Workers call for help when workers can't. With GPS Location Tracking, you can track workers in real-time for added security, safety and accountability.

WAVE™



WAVE Push-to-Talk Application

Leverage the resources you already have to communicate with personnel on their own devices. WAVE extends your radio's reach to those who may not carry radios. Now the field supervisor away on business or the IT director outside the treatment plant can talk on their smartphones with radio users. WAVE connects to virtually any device – smartphones, laptops, tablets, landlines and more – on any public or private mobile data network, including Wi-Fi. You get seamless and secure connectivity, affordable Push-To-Talk (PTT) and the freedom to keep service plans and devices.



LEX L11 Mission-Critical LTE Device

While the WAVE application operates on any Android or iOS mobile device, Motorola Solutions offers two purpose-built devices your staff may find more appropriate for their needs.

The Android-based LEX L11 offers the touchscreen usability and convenience of a smartphone, but ruggedized and optimized for push-to-talk operation. Tested to military specifications, the LEX L11 offers very loud audio to enable PTT conversations even in noisy environments. Even the device holster is physically designed to route audio transmissions to the user's ear. Featuring two programmable side buttons, and an emergency button, the LEX L11 quickly connects your staff to resolve issues.



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CRITICAL CONNECT

Interoperable Communications

Critical Connect delivers simple, flexible, scalable intra- and inter-agency communications across town, across the state or across the nation. With one link, agencies can connect with other agencies, as well as personnel outside of LMR coverage – providing dynamic, seamless Push-To-Talk communication whenever and wherever needed.



SOLUTION SET



COMMUNICATE
INSTANTLY

ACCESSORIES



IMPRES 4300 mAh Li-Ion Intrinsically Safe Battery

IMPRES Lithium-ion (Li-ion) 4300 mAh Intrinsically Safe Battery, Rugged IP68 for APX and SRX Series Radios.



Heavy-duty Headsets

Motorola heavy-duty headsets include a variety of solutions to meet your needs for high-clarity, hands-free, discreet two-way communication.

IMPRES Remote Speaker Microphone

This submersible remote speaker microphone features Windporting, emergency and programmable buttons, making it ideal for the most adverse conditions.

EP7 Sonic Defenders Ultra

These comfortable foam-tipped earplugs, work with surveillance kits and provide up to 28 dB hearing protection.

Temple Transducer

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MANAGED & SUPPORT SERVICES

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ASTRO Infrastructure Services

Your network. Our expertise. From network monitoring to software updates, partner with us to ensure availability and that your system performance goals are achieved.



APX Device Management Services

Managing your two-way radio fleet doesn't have to be time-consuming or costly. With APX Device Management Services, choose the right level of service for your operations - so you can be supported for more efficient radio management or transfer the day-to-day accountability to us.



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To protect your critical infrastructure from cyber threats, you need a multifaceted approach to cybersecurity. Protect your communications investment with a comprehensive plan today, because it's not a matter of if you'll be hacked - but when.



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COMMUNICATE WITH ADDED INTELLIGENCE

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Ally is a single platform where you can capture incident information in real time across multiple devices, analyze incident trends using easy, built-in reports, and act on improved insights for more proactive security planning.



MC-EDGE INTELLIGENT GATEWAY

Smarter, More Secure IoT

Whether daily operations, a natural disaster or man-made emergency, our mission-critical IoT products and solutions are always on, providing a new level of connectivity, automation and security.

Edge gateway is P25, LTE and LoRa ready, capable of handling inputs from hundreds of low-power wireless sensors up to 10 km. And with extensive security and ultra-reliable communication capabilities, MC-Edge makes it easy to implement, support and grow your IoT systems to fully support all your mission-critical operations.

This intelligent gateway protects your sensitive data from cyber attacks with end-to-end encryption. Full authentication, bulletproof access control and digital signatures keep your information safe.



SIREN SOLUTIONS

Community Safety and Alerting

Keep communities safe with reliable, secure, event-specific emergency notification systems. Our siren alerting capabilities enable operators and system maintenance personnel to proactively manage mass notification and emergency alert systems over a mission critical network.

LTE BROADBAND

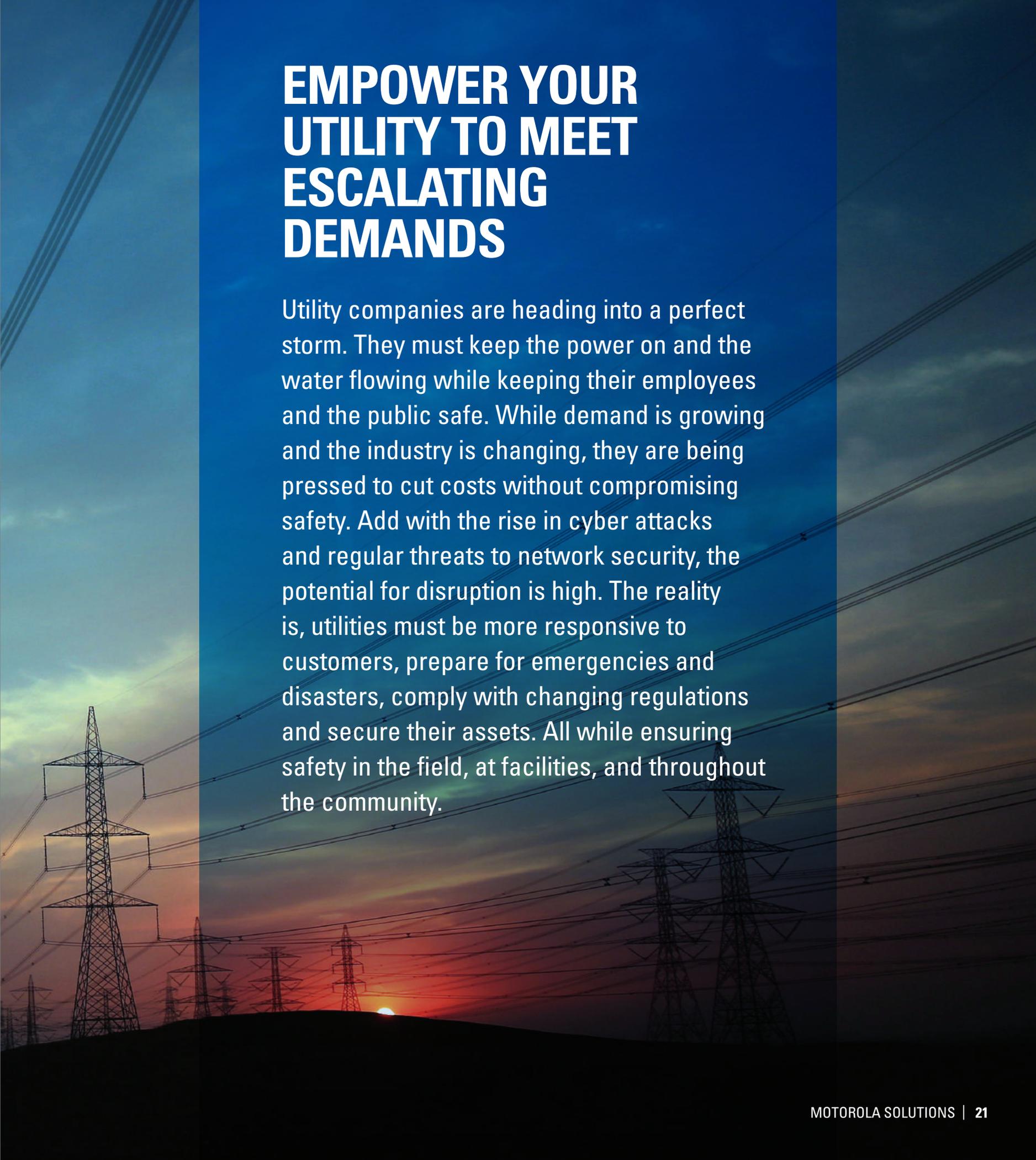
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UTILITIES





EMPOWER YOUR UTILITY TO MEET ESCALATING DEMANDS

Utility companies are heading into a perfect storm. They must keep the power on and the water flowing while keeping their employees and the public safe. While demand is growing and the industry is changing, they are being pressed to cut costs without compromising safety. Add with the rise in cyber attacks and regular threats to network security, the potential for disruption is high. The reality is, utilities must be more responsive to customers, prepare for emergencies and disasters, comply with changing regulations and secure their assets. All while ensuring safety in the field, at facilities, and throughout the community.



SOLUTION SET



COMMUNICATE WITH ADDED INTELLIGENCE

AVIGILON

Self-Learning Video Analytics and AI-Powered Security Solutions

Supercharging your utility operations and unified communications with advanced HD video surveillance systems will help keep your end-to-end processes streamlined and secured with high levels of service reliability. That means electric utility companies can identify where power lines have been damaged in a storm and take swift action, water utility companies can proactively monitor the purity of a city's water supply and nuclear power plants can ensure their perimeter is more secure than ever.

Our unique video solution offers video analytics built into a broad range of cameras, artificial intelligence, machine learning platform, high definition video stream management with smart codec technology and easy integration with existing camera systems.



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LTE BROADBAND

Interoperable Communications

Providing new effective levels of safety, reliability and service delivery to enable better decision making in a system that demands convergence of mission critical voice, video and data is more important than multiple silo systems running off their own. It's about delivering new ways to connect multiple grid assets and people to information and to each other.

There's an increased number of utility assets with a wide range of data bandwidth and capacity needs, the demand for mission critical performance and high-assurance security compliance requires an integrated converged solution across multiple networks (narrowband to broadband), devices and applications to achieve high reliability, availability and redundancy. To get the most out of a world that offers richer real-time information, you need a complete ecosystem that encompasses public/private LTE networks, smart applications, purpose-built, intuitive devices and comprehensive services. Count on our LTE solutions to deliver anywhere, anytime access to multimedia information with the priority, resilience and security you demand.



SOLUTION SET



COMMUNICATE INSTANTLY

SYSTEMS

ASTRO (P25) System

ASTRO 25 is the robust, resilient, always available communication network that streamlines interoperability among agencies and neighboring communities. Because ASTRO 25 is a dedicated system, it helps ensure voice and data is available during emergencies and peak demand. It enables safety-focused applications like geofencing, GPS location tracking and siren alerting. And it minimizes response times with intuitive solutions and accurate record-keeping of critical communications. ASTRO 25 also paves the way for LMR and LTE convergence with a common platform that reduces complexity and cost.

For daily operations and disaster response, ASTRO 25 provides the interoperability you need to communicate directly with other agencies. If a broken water main requires police to close a road or a power outage needs public safety support, crews can respond more safely and efficiently.

RADIOS

APX 4000



APX P25 two-way radios redefine safety in communication. Every innovative feature and function is designed with input from real users. From its rugged, easy to operate design to the loudest, clearest audio, your crews can hear and be heard distinctly above road noise, diesel engines and severe weather. APX stands up to the toughest conditions and most extreme environments to help your workers and community stay safe.

Take this a step further and leverage Work Order Ticket Management to boost efficiency and accountability with text-based issue management software, so you can quickly resolve issues and exceed expectations.

With GPS Location Tracking, you can track staff both inside and outside for added security, safety and accountability. Whether you are identifying the closest employee to assist with a guest issue, or locating an injured staff member unable to respond, visibility to every employee's location is a critical aspect in preserving the safety and comfort of guests and your personnel.

WAVE™



WAVE Push-to-Talk Application

Leverage the resources you already have to communicate with personnel on their own devices. WAVE extends your radio's reach to those who may not carry radios. Now the field supervisor away on business or the IT director outside the treatment plant can talk on their smartphones with radio users. WAVE connects to virtually any device – smartphones, laptops, tablets, landlines and more – on any public or private mobile data network, including Wi-Fi. You get seamless and secure connectivity, affordable Push-To-Talk (PTT), and the freedom to keep service plans and devices.



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SOLUTION SET



COMMUNICATE
INSTANTLY

ACCESSORIES

Sonic Defenders Ultra

Sonic Defenders Ultra are comfortable foam-tipped earplugs, work with surveillance kits and provide up to 28 dB hearing protection.

Temple Transducer

Receive and transmit audio with bone conduction technology with the Rugged Temple Transducer, ideal for tactical environments. Designed for APX Display Remote Speaker Microphones.

Heavy-duty Headset

Motorola heavy-duty headsets include a variety of solutions to meet your needs for high-clarity, hands-free, discreet two-way communication.



IMPRES Remote Speaker Microphone (RSM)

IMPRES Remote Speaker Microphone (RSM) comes with Volume Toggle Switch and Emergency Button that are easy to operate even while wearing gloves.



IMPRES 2800 mAh Li-Ion Battery

IMPRES batteries, when used with an IMPRES charger, provide automatic, adaptive reconditioning, end-of-life display, and other advanced features. Data is stored in the battery and communicated to the charger via a unique IMPRES communication protocol, which is designed to maximize talk time and optimize battery cycle life.

Digital Vehicular Repeater System

A small, rugged, self contained, radio base station integrated with Motorola remote mount APX or XTL series mobile radios. It improves portable radio coverage for police, fire and other emergency personnel by using the higher power of the mobile radio in the vehicle to extend the range of the portable back to the radio system. The DVRS is also available as a standalone repeater for local repeat only.



MANAGED & SUPPORT SERVICES

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Cybersecurity Services

To protect your critical infrastructure from cyber threats, you need a multifaceted approach to cybersecurity. Protect your communications investment with a comprehensive plan today, because it's not a matter of if you'll be hacked - but when.

CONCLUSION

At Motorola Solutions, we are focused on tomorrow; on the future of creating safer cities and enabling businesses to thrive. This focus ensures everything we do comes back to our promise; to mobilize and connect people in the moments that matter. We are helping companies around the world transform the way they operate by leading mission critical communications platform and our expertly integrated solutions, systems, applications and services. We connect personnel, facilities and equipment together to help their operations run more efficiently and safely, control infrastructure and reduce risks and costs. At the same time, we are adding digital intelligence making it possible to do more with less. Our ability to connect applications puts real time, accurate and transparent information into the hands of users to help them make better choices.



BONUS RESOURCES

SEE THESE
SOLUTION SETS
IN ACTION



[Arkansas Valley Electric Cooperative Corporation Case Study](#)



[Northeast U.S. Electric Utility Case Study](#)



[Connexus Energy Case Study](#)




IMPROVE THE EFFICIENCY OF GAS DISTRIBUTION SERVICES WITH THE INDUSTRIAL INTERNET OF THINGS

The deployment of an **Industrial Internet of Things** solution used a Motorola solution to drive a massive upgrade in gas distribution services with significant efficiency gains, faster distribution and the security of non-intrusive read-ups.

CHALLENGE
 The utility is the largest provider of gas distribution services in the region, serving over 1 million customers. The utility's gas distribution services are critical to the region's economy and safety. The utility's gas distribution services are critical to the region's economy and safety. The utility's gas distribution services are critical to the region's economy and safety.

SOLUTION
 The utility deployed a Motorola solution to drive a massive upgrade in gas distribution services with significant efficiency gains, faster distribution and the security of non-intrusive read-ups.

RESULTS
 The utility achieved a 25% reduction in gas distribution costs, a 10% increase in distribution efficiency, and a 10% increase in the security of non-intrusive read-ups.

MOTOROLA SOLUTIONS

[Natural Gas Use Case](#)



MISSION CRITICAL INTERNET OF THINGS

MASS NOTIFICATION AND SMART SIREN SOLUTION

25% reduction in mass notification costs

\$3.9 million in savings

MOTOROLA SOLUTIONS

EXPLORE THE MISSION CRITICAL INTERNET OF THINGS

[Interactive IoT Tour](#)



CONNECTED UTILITY: EXPERIENCE POWERFUL, INTEGRATED COMMUNICATIONS FROM END TO END

MOTOROLA SOLUTIONS

EXPERIENCE POWERFUL, INTEGRATED COMMUNICATIONS

[Connected Utility](#)



To learn more about how you can transform the way your company communicates with integrated solutions for radios and beyond, please visit:

MotorolaSolutions.com/OilAndGas

MotorolaSolutions.com/Mining

MotorolaSolutions.com/Utilities



Motorola Solutions, Inc. 500 West Monroe Street, Chicago, IL 60661 U.S.A. motorolasolutions.com

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