Digital Transformation in Mission-Critical Communications: Enabling Seamless Transitions from legacy to PTToC Solutions

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STREAMWIDE - TNChE Asia 2025

What are Mission/Business Critical Communication?

Mission-Critical Communication

Communication that must not fail during emergencies or day-to-day operations essential to public safety, health, and national security.

Business-Critical Communication

Communication essential to continuity, productivity, and safety in industries such as energy, transportation, and manufacturing.

Transition from TETRA/P25 to PTToC

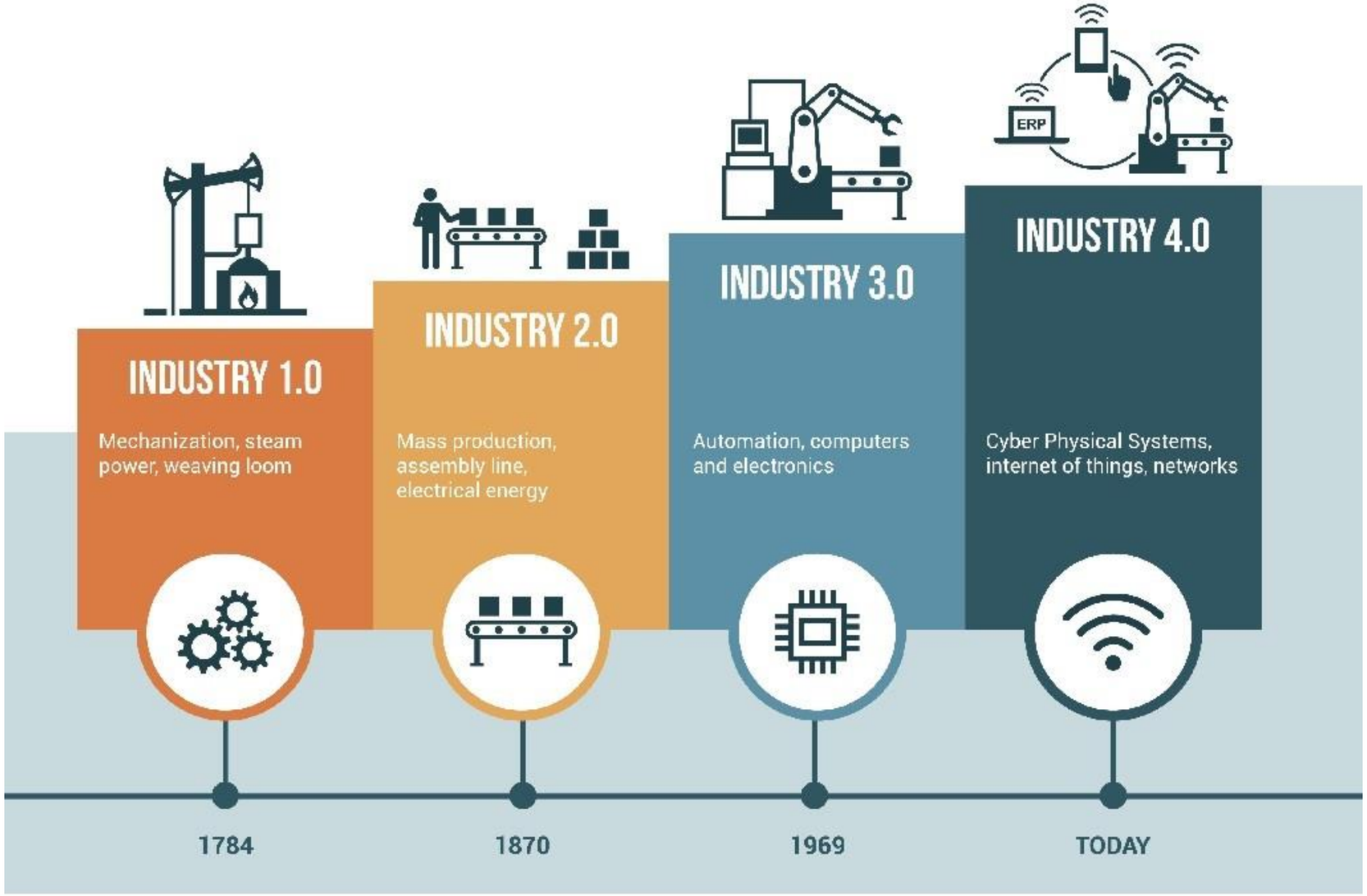
- Dedicated infrastructure
- High maintenance: costs and operations
- Limited interoperability
- Restricted to PTT operations
- Scalability Issues
- Geographic Limitations
- Feature limitations and sunset technology

Modernization of critical communication

- Networks: LTE/5G & Wi-Fi with End-to-End encryption
- Interoperability : link PTT groups with legacy radio groups via RoIP Gateway or LMR-IWF
- Easy deploymen, better Audio Quality, future-proof technology, …t, advanced features, better scalability, lower device costs

Towards Industry 4.0

The evolution of communication networks as a core enabler

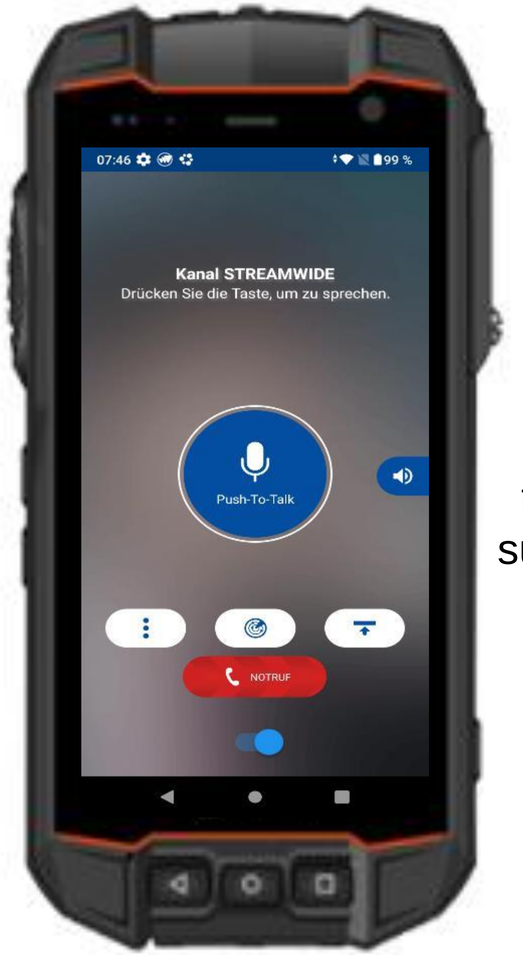


Zone 1/21

SOS button
to trigger alert

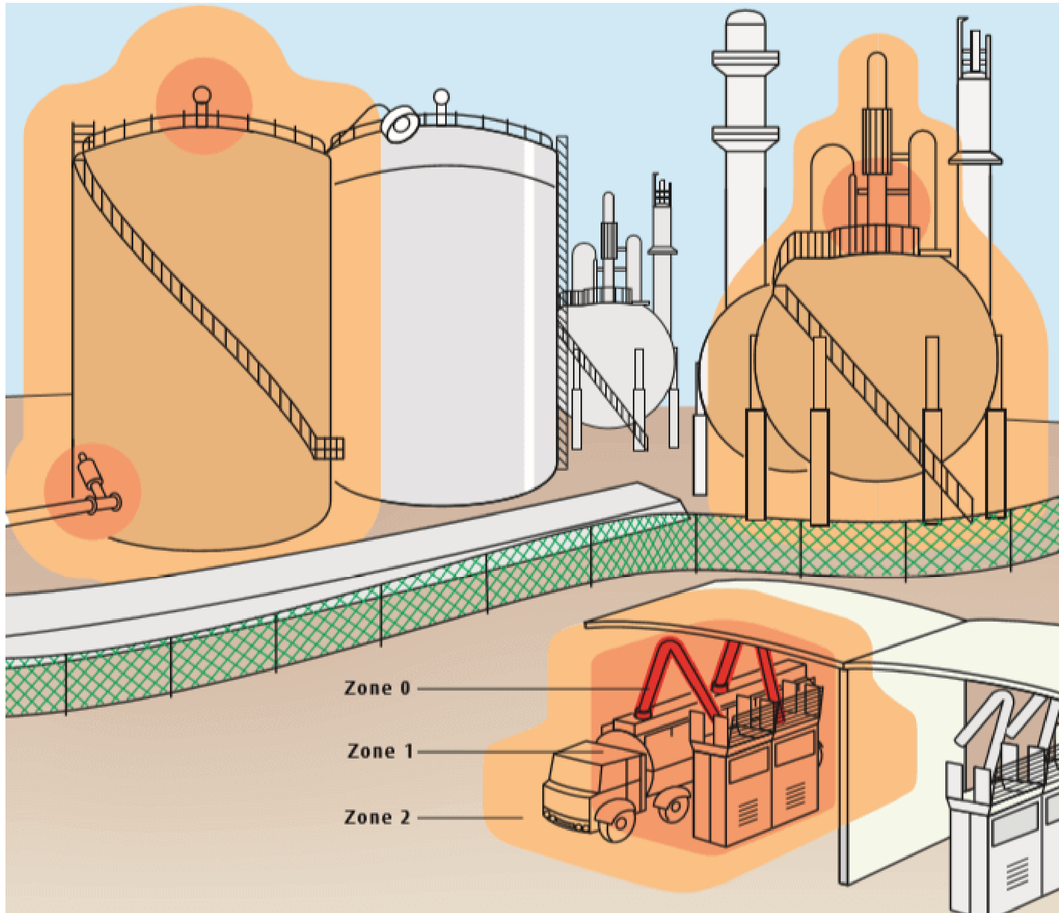
Knob selector
to switch between channel

PTT button
To take and release the floor



Camera
to stream surrounding

Channel selector
To change your talkgroup with talkgroup name spell out



Empowering mobile workers:
MCx software meets Cellular/Wi-Fi network on a Rugged Zone1/2 Smartphone

Unlimited Coverage : Unlike walkie-talkies or DECT systems, provides seamless connectivity without range limitations.

Tool Unification: One smartphone, one solution: streamline operations, reduce costs, and maximize ROI.

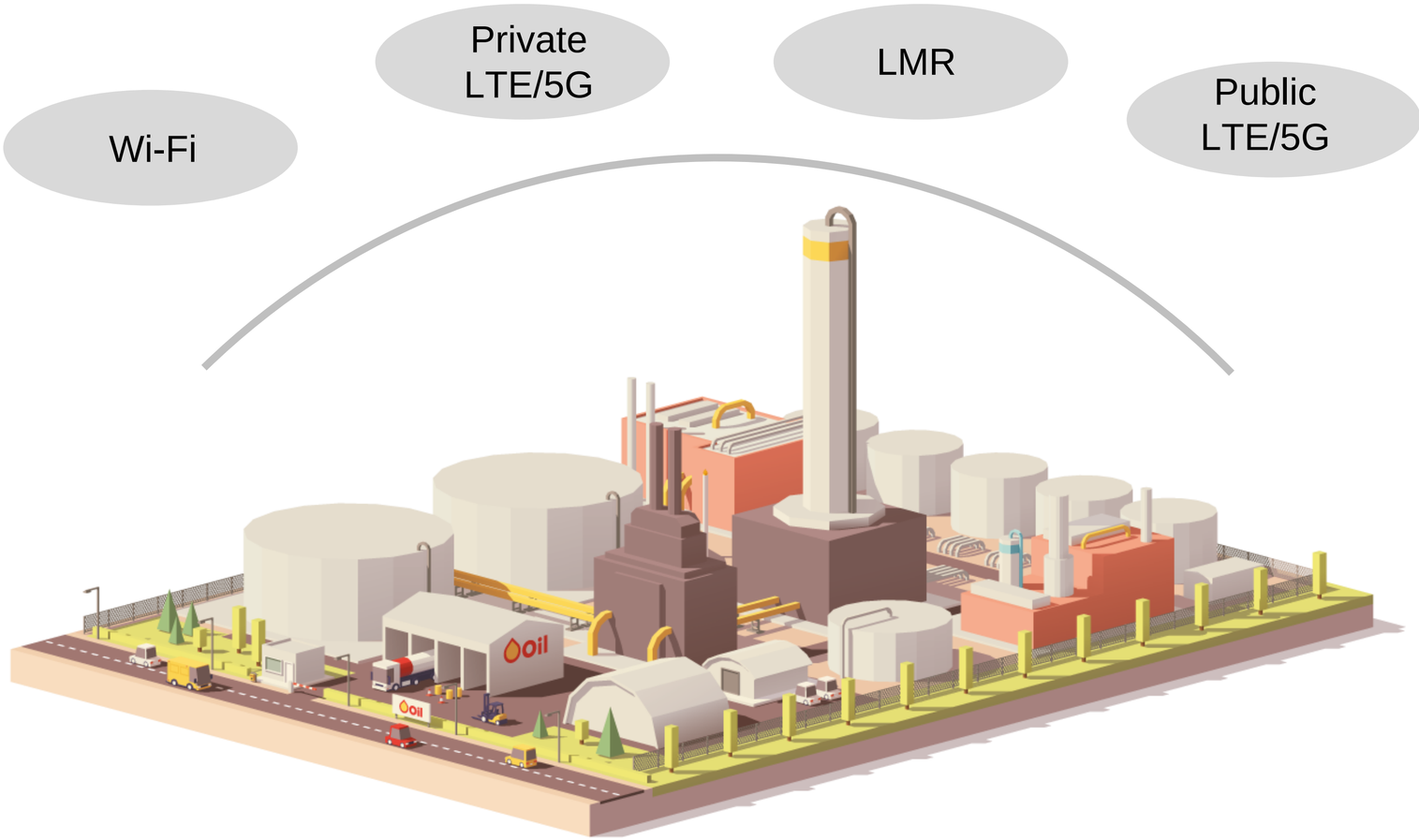
Data Security: Exchange sensitive information securely with all communication being encrypted.

Paperless Workflow: Digitize mission processes and workflows to enhance efficiency, simplify operations, and eliminate data entry errors.

Digital Briefcase: Instantly access all processes, guides, and documentation from your smartphone.

Integrated emergency alert system: Strengthen employee protection and ensure regulatory compliance.

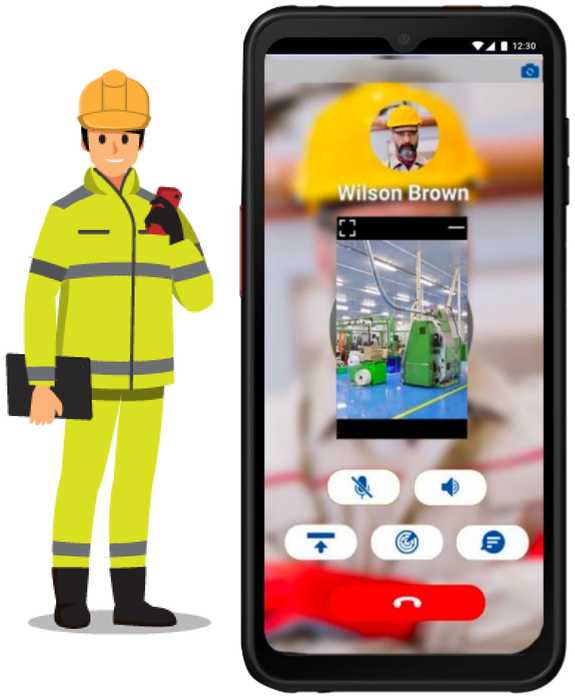
Ensuring Always-On Connectivity with Multi-Network MCX

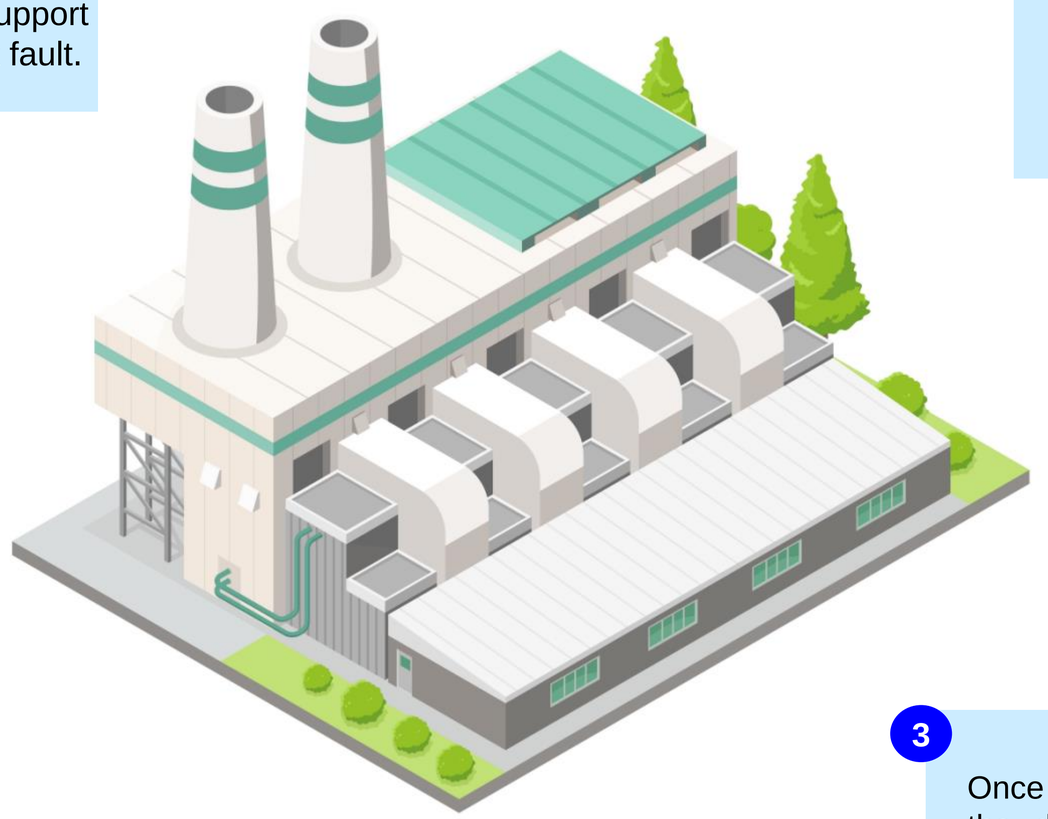


Fast Fault Resolution Thanks to Remote Support

1

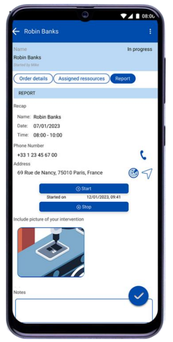
In the factory, a technician needs support from a supervisor to resolve a complex fault.





2

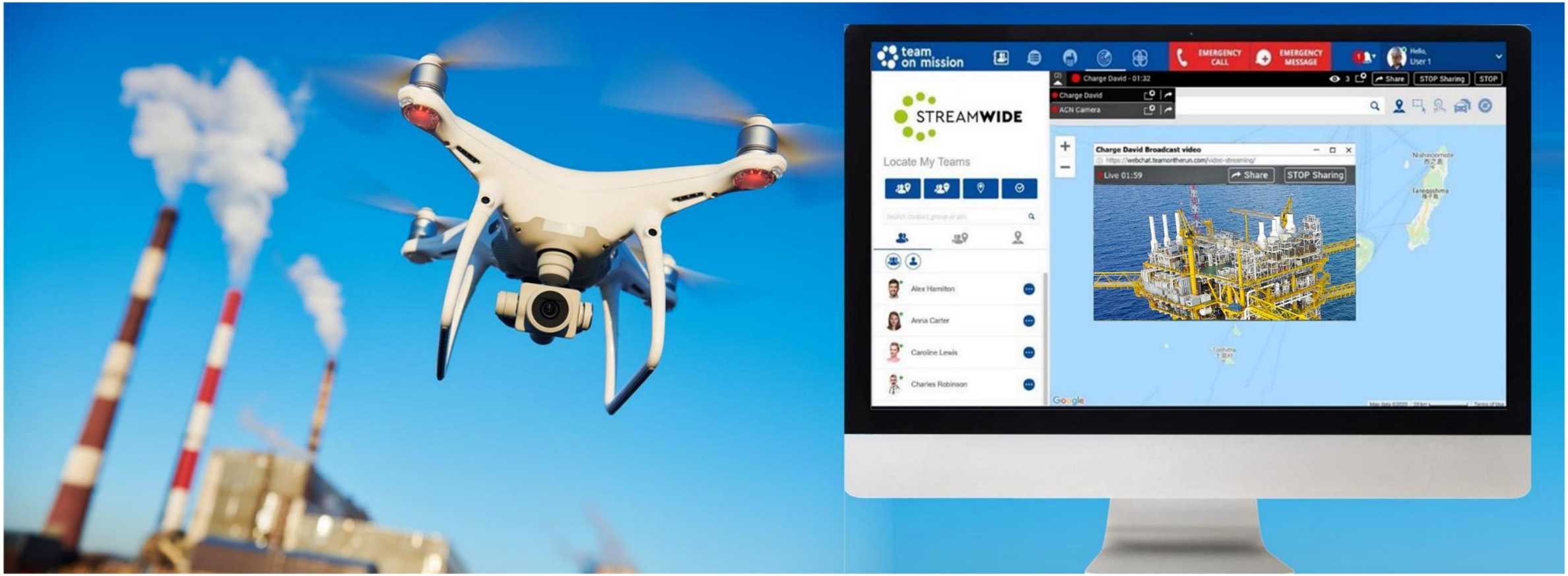
He calls his supervisor and starts a video stream. The supervisor guides him remotely and shows him what to do to fix the fault



3

Once the machine is repaired, the technician fills out the digital form with all the required information, uploads a photo as proof, and the process is then automatically sent to the manager.

Situational awareness



Security supervisors in control room can conduct security checks remotely, leveraging video feeds from external sources such as drones and surveillance cameras. Security supervisors can receive these video feeds in real-time. Field security teams can use drones to perform remote site checks, identifying issues such as malfunctions or accidents. The real-time information transmitted to security supervisors aids oil and gas operators in protecting employees from dangerous situations more effectively.

Emergency Alert System to protect team people and sites.

1

Field operators can use the **emergency alert systems** to notify dispatchers/supervisors of safety hazards, equipment malfunctions, or other critical incidents in real-time, ensuring prompt evacuation or response to mitigate risks. (Ex. Oil Spill)

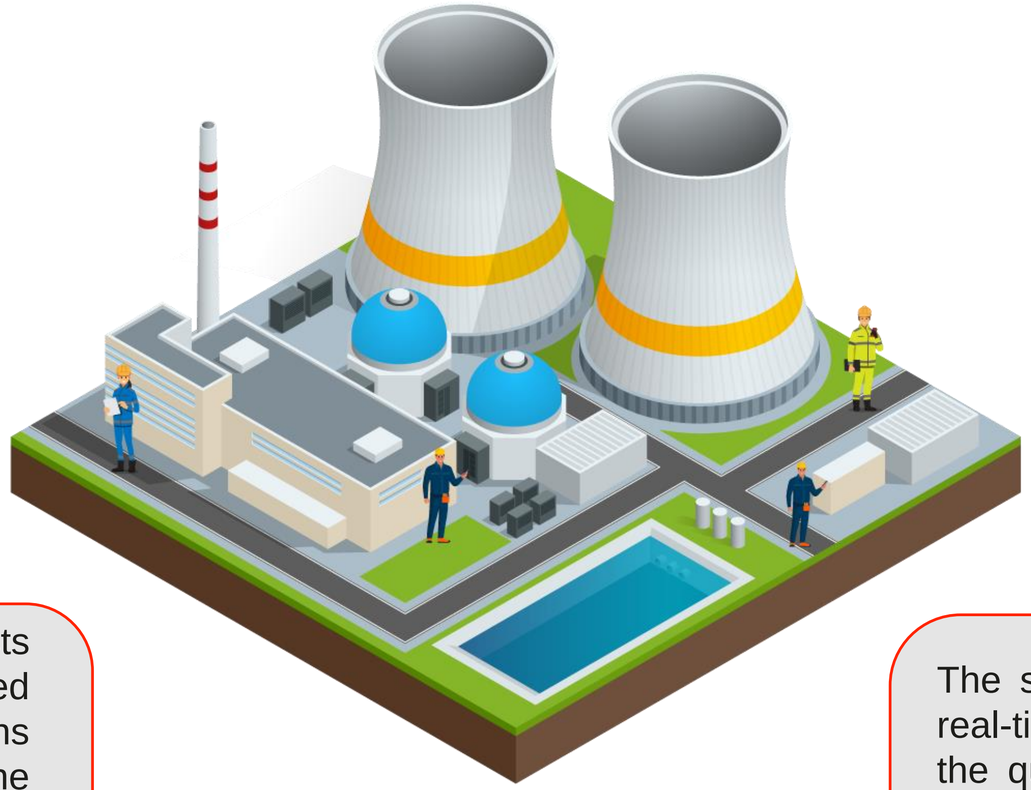
2

Dispatcher receives alerts in real time and can send help immediately.

3

MCPTT enables quick communication and coordination among field operators, environmental response teams, and regulatory agencies. This ensures a rapid and coordinated response to contain the spill, minimize environmental damage, and protect worker safety.

Digitization to improve efficiency



1

The quality controller performs tests and analysis to ensure that refined products meet quality specifications and regulatory standards. The controller can fill in the digital form and complete the checklist on the mobile/tablet and send it to the supervisor for approval.

2

The supervisor receives the quality process in real-time, checks all details. If everything meets the quality standards, the supervisor approves the process and coordinate with other departments. Detailed reports are also available on the **Team on mission** platform helping managers to take decisions based on real-time information.

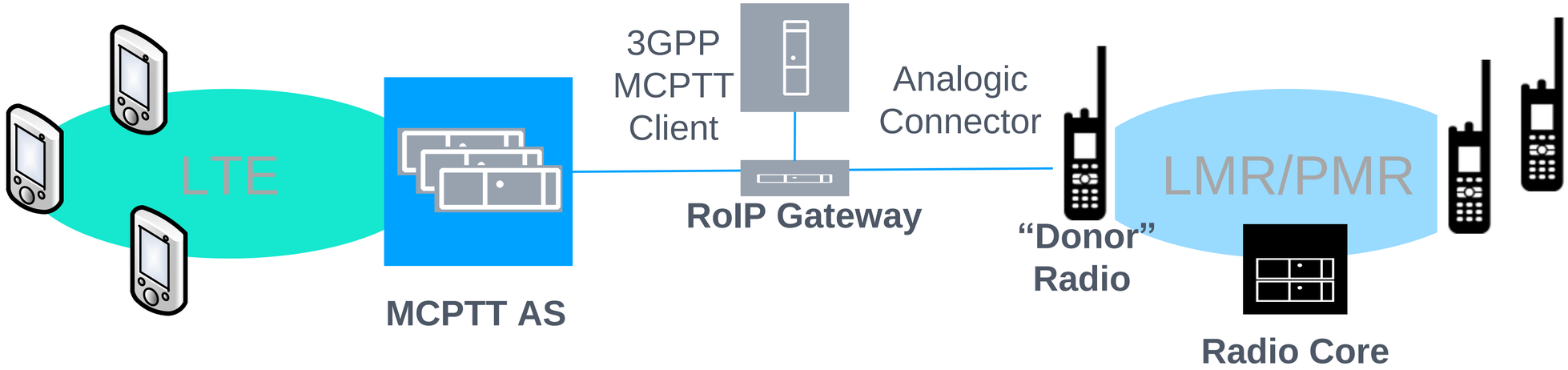
Summary

Feature	MCx (Mission Critical Services)	PMR (Professional Mobile Radio)
Network Type	LTE/5G networks (public and private)	Dedicated digital radio networks
Voice Communication	High-quality voice + data	Quality voice
Data Communication	High-speed data (video, images, documents)	Limited data (text messaging, basic applications)
Coverage	Public/Private LTE/5G networks, Wi-Fi	Limited to dedicated infrastructure (local coverage)
Interoperability	High, based on global standard 3GPP (LTE/5G)	Limited, confined to specific countries/regions
Device Flexibility	Rugged smartphones, tablets, laptops, IoT devices	Specialized radios (handheld or vehicle-mounted)
Cost	Lower cost, uses existing cellular infrastructure	High cost, dedicated networks
Priority & Pre-emption	Allows prioritization/pre-emption	Limited, depending on system configuration
Future-Proofing	Access to 5G/6G and constant technological upgrades	Low to moderate, evolves slowly
Global Adoption	Growing rapidly in public safety, logistics, & utilities	Rely on proprietary or national standards
Security	Encryption, robust security, follows innovation	Encryption, robust security

LTE - LMR Interoperability.

- Extend coverage of existing LMR footprint.
- Gradual transition and convergence to LTE technologies
- Expand collaboration and coordination between teams

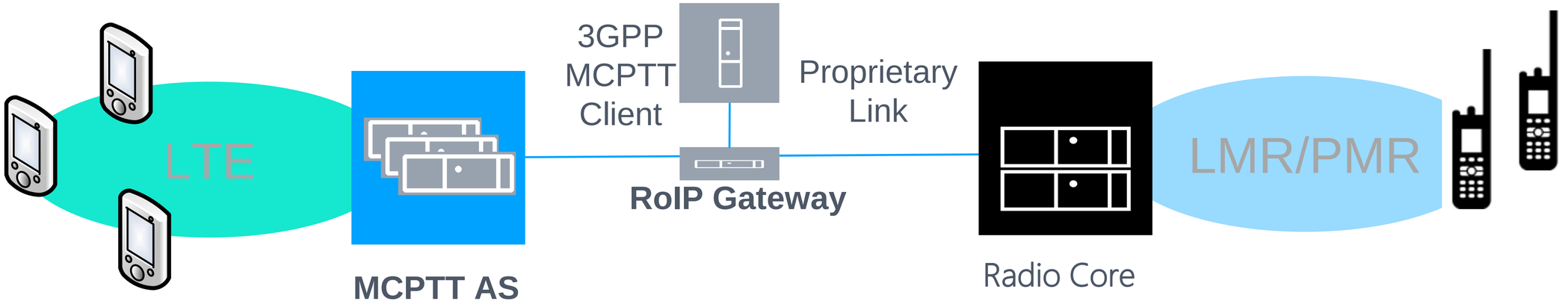
Interworking – Interconnection via RoIP Gateway



Donor radio based integration (RoIP)

- Simple and proven solution (in production since 2016), wide compatibility
- Limited in scaling, each interconnected group requires a dedicated radio
- Functional limited to group calls / emergency calls (no SDS, no geolocation)

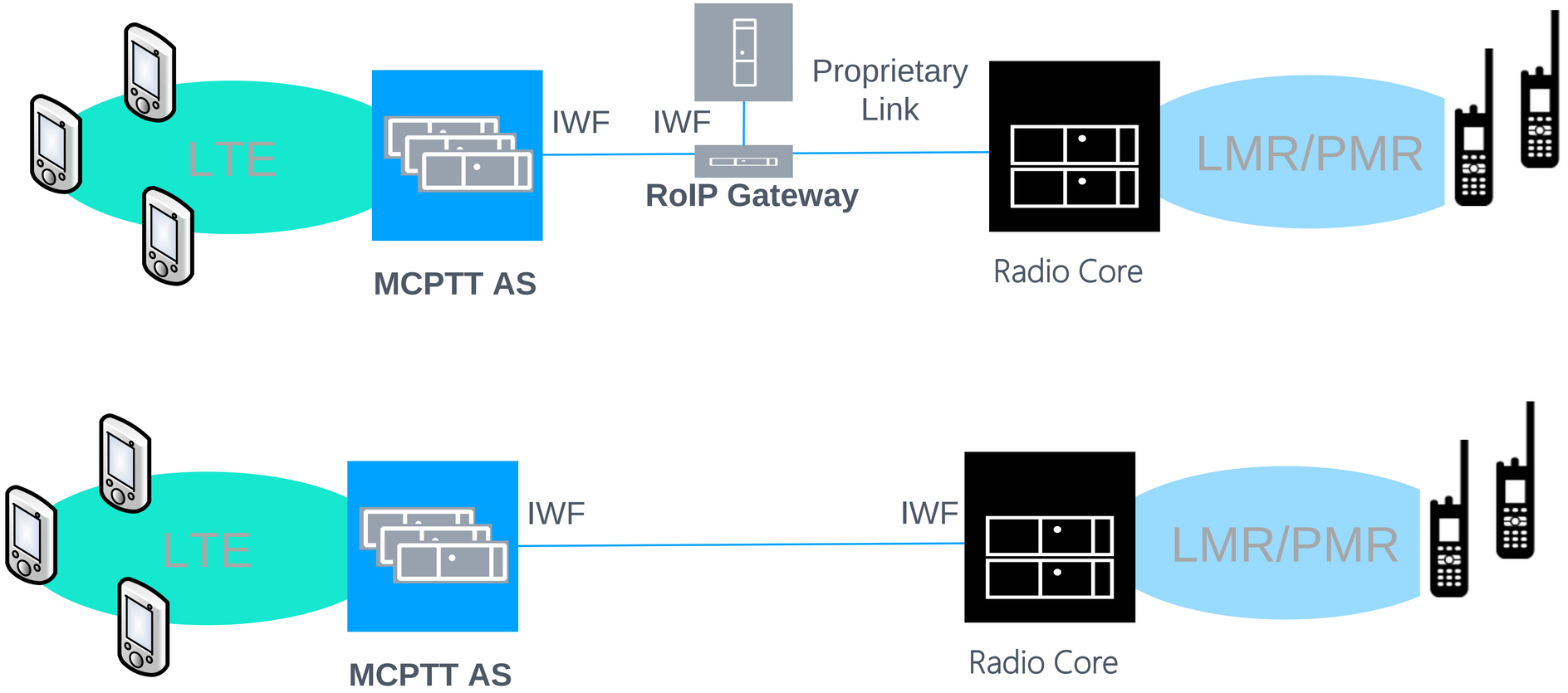
Interworking – Interconnection via RoIP Gateway



“Core” interconnection via RoIP gateway

- **Dependent on the level of integration of the RoIP gateway with the proprietary core**
  - **Allows large-scale interconnection of groups**
- **More extensive functionality: private call, group calls, geolocations (no SDS)**
  - **Prohibitive interface licensing cost**

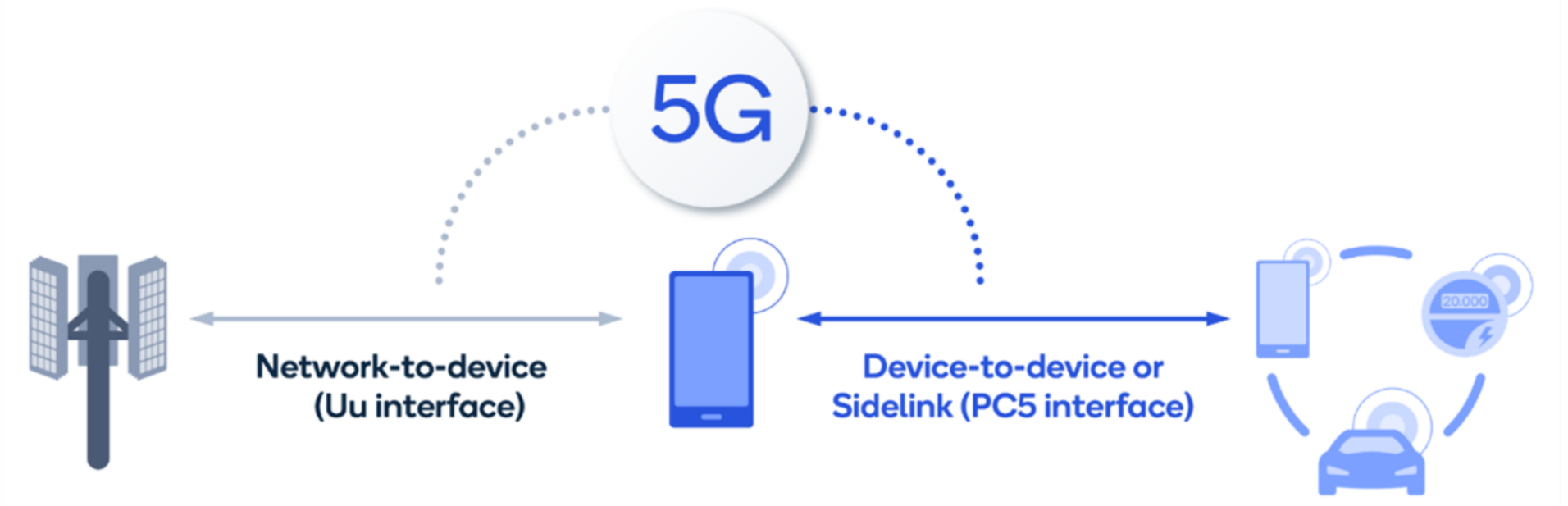
Interworking – Interconnection via IWF



- **Standardized 3GPP interface (validation of compatibility between vendors via ETSI PlugTests)**
- **Allows you to achieve a better level of functional parity - Voice & Data**
- **Dependent on the goodwill of the manufacturers**

Future trend and innovation for Mission Critical Communication

Direct Mode Operation (DMO) and Relay Mode.



Thank you

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