

# **3GPP Mission Critical Broadband Services (MCX): Best Practices and Successful Deployment Case Studies**

Presenter: Faz Moradi

.....

**Australasian Critical Communications Forum, chapter of TCCA**

# Agenda

## 3GPP Global Standards

**Important Step Towards Standardisation:** Testing, Certification and Activation

Standardisation Roadmap

LMR to MCX migration path

## MCX Applications with Real-world Results

Case studies:



## About 3GPP – Global Standardisation

**3rd Generation Partnership Project (3GPP)** unites seven international regional telecom standard development organizations from USA, Europe, China, Japan, South Korea and India

**“Mission Critical Services are enabled by 3GPP standards, becoming a major contributor to the global economy”**

3GPP provides their members with a stable environment to produce the reports and specifications that define 3GPP technologies for 3G, 4G, 5G standards and beyond evolution that underpin global cellular wireless systems.



**3GPP 7 Organisational Partners**



**3GPP 27 Market Representatives**

# Critical communications for all professional users

# Why Open Standards are so important

## Open-standard compliance ...what does it mean

- Standards create a constantly evolving ecosystem of investment, development and manufacturing and reduce unnecessary variety in the marketplace
- It encourages competition, competitive price environment, innovation and associated economies of scale that ultimately benefit all stakeholders and particularly the end users
- Assurance that everything from different vendors is going to work together = pick the best solution from a range of options in line with global standards such as **3GPP, ETSI and NIST**
- You will get longer term support as standards provide an even, public playing field and you will not be trapped by a single vendor & proprietary solutions
- Vendors develop more capabilities to differentiate



# Path to success- Important Step Towards Standardisation





# 3GPP MCX Plugtests, hosted by [Texas A&M University](https://arcia.org.au)



**Harald Ludwig** • 2nd

Expert for Mission Critical and Professional Mobile Radio Comm...  
10mo • 🌐

+ Follow ...

The Interop Institute has kicked off here at [Texas A&M University](https://arcia.org.au) in College Station with the welcome speeches. [#Interop24](#) [#Interoperability](#) [#Standards](#) [#MissionCritical](#) [#MCPTT](#) [#MCX](#)



**Motorola Solutions**

612,829 followers  
6d • 🌐

What does it mean for you when your critical communication systems work seamlessly together?

Last month, [#MotorolaSolutions](#) took a key step in making that a reality at the 9th 3GPP MCX Plugtests, hosted by [Texas A&M University](https://arcia.org.au).

We successfully demonstrated:

- ✅ MCX-to-MCX interoperability: Seamless MC-PTT calls & dynamic regrouping
- ✅ MCX-to-IWF interoperability: End-to-end group calls with TETRA radio systems
- ✅ Multicast MC-Video & MC-PTT: Standards-based interoperability with vendors
- ✅ MCX-AS compatibility: Proven integration with multiple mobile clients & Control Room Solutions

Discover how these advancements are driving the next generation of mission-critical communication: <https://bit.ly/4hikQil>.



# Standardisation Roadmap



## Release 12 (2015)

- LTE MC GCSE enablers
- QCI 65, 66, 69, 70
- MBMS (MB2U/C)
- LTE ProSe for D2D comm

## Release 14 (2017)

- MC services (MCX) common architecture
- MC Data
- MC Video
- QCI 67

## Release 16 (2020)

- MC interconnection and migration
- MCX enhancements
- MC Railways support (FRMCS)
- NR Prioritized PRACH for MCS/MPS
- NR IAB (Integrated Access and Backhaul)



## Release 18 (2023)

- MCX over 5G (5MBS, ProSe)
- MCX enh., rail interconnect & migration, gateway UE
- 5MBS, 5G ProSe enhancements
- VMR, NTN enhancements, location enhancements, ...



## Release 21

2015    2016    2017    2018    2019    2020    2021    2022    2023    2025 -2030

## Release 13 (2016)

- MC PTT
- Architecture (incl. use of eMBMS, ProSe)
- IOPS (LTE)
- Informative deployment model

## Release 15 (2019)

- MC interworking
- TETRA/P25
- 5G QoS framework; MC 5G 5QI
- NR Unified Access Control (UAC)



## Release 17 (2022)

- MCX enhancements
- MC IOPS (LTE)
- MCX over 5G (unicast)
- 5G Multicast/Broadcast system (5MBS)
- 5G Proximity Services (D2D)
- 5G Non-terrestrial networks, UAS
- IAB enhancements

## Release 19 (2025)

- MCX enhancements
- 5G Multicast/Broadcast system (5MBS)
- 5G Proximity Services (D2D), multi-hop
- 5G Non-terrestrial networks

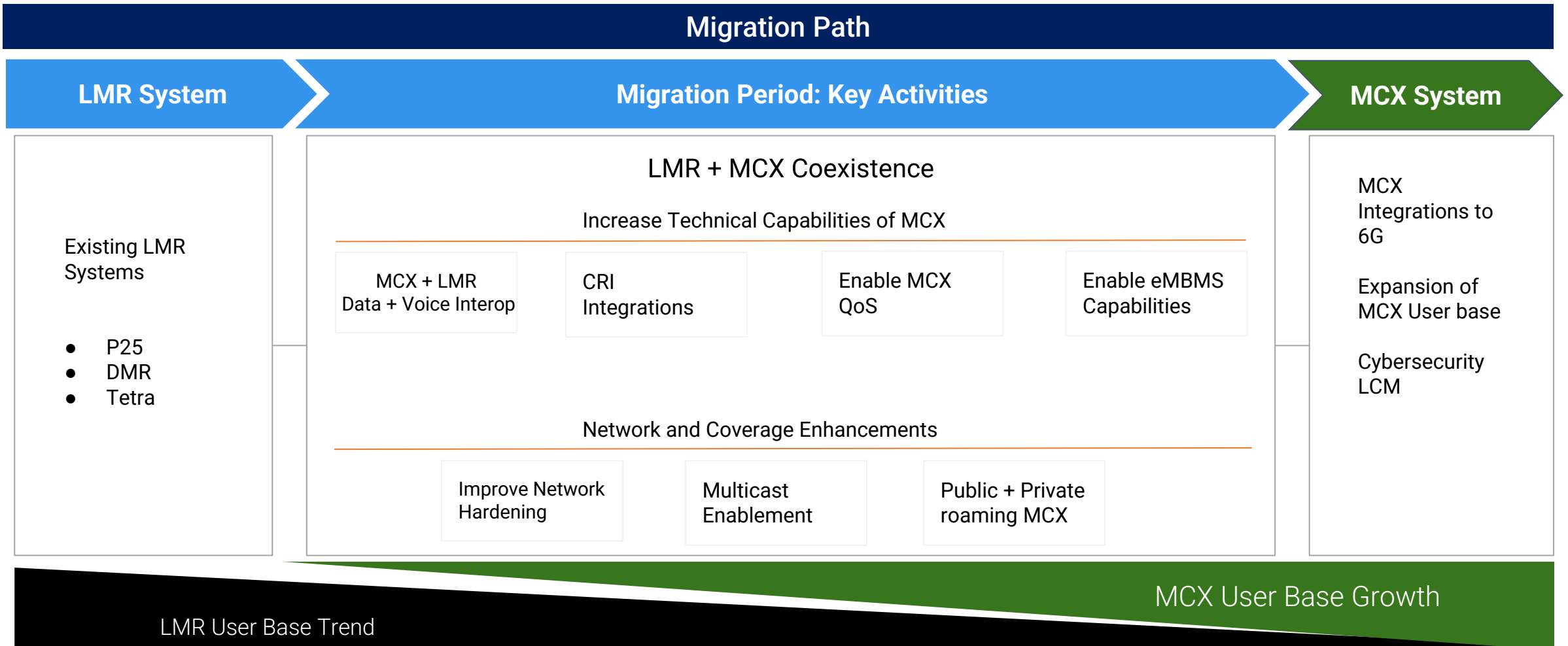


# Continuous Technology Evolution





# Migration Path LMR to MCX



# MCX Applications with Real-world Results

## Case Studies:



## PETRONAS PROFILE

- **Largest O&G Company in Malaysia**
- Estimated 10,500+ LMR radio users
  - 8 TETRA Systems
  - 5 DMR systems



## NEW CONTRACT

- Critical connect
  - 7 years contract
  - MCX hosted in Singapore
  - 6,000 mobile user subscription (voice & video)
  - 33 dispatcher user subscription (voice & video)
  - 6 Wireline interfaces + 44 ROIP Wireless gateways
- Gradual ramp up of PTX users.

## KEY BENEFITS

- Communication between multiple sites/functions across multiple LMR and MCX technologies
- Common dispatchers can monitor 55+ sites across the country from central and regional operation centers
- Use MCX in private LTE networks installed in Offshore and Onshore platforms



# Indonesia Police

## INDONESIAN PROVINCIAL POLICE

- Police agency for Indonesia, 400K Police officers
  - 5000+ islands
- P25 LMR
  - 300 trunking, 100 conventional sites
  - Multiple systems, 25 P25 MSOs
  - 265,000 P25 devices



## MCX IMPLEMENTATION

- MCX on-prem solution
  - 16,500 PTX Users / 265,000 P25 Users
  - 25 P25 systems connected via WRG and ISSI
    - Locally hosted universal gateway
  - 190 ROIP gateway connections
  - 16K LEX11 devices
- Upgrade P25 systems to support ISSI and WRG interface

## KEY BENEFITS

- Centralised coordination: nationwide across multiple LMR Networks
- Cross agency communication: with both MCX and P25 subs
- Redundancy/coverage: addressed by LTE
- Cost benefits by using commercial LTE Network



## ICON WATER PROFILE

- Icon Water is wholly owned by the ACT Govt
- Manages and operates all water and wastewater services for the ACT
- Using old TMR analogue MPT system, well past end of life
  - TMR network being decommissioned by the network owners
  - TMR network provided unsecured voice only communications



## MCX IMPLEMENTATION

- Resilient MCX platform hosted on cloud
- Resilient Mobile Wi-Fi solution that can be used anywhere
- Resilient In-building coverage
- Integration with PBX, SSO, SMS
- 24/7 monitoring & support through Vertel NOC

## KEY BENEFITS

- Group Calling
- 1 to 1 calls. PTT & full duplex
- Emergency & remote worker protection
- Location Services
- Multimedia
  - Video Calls
  - File sharing
  - Video stream sharing



# Isis Central Sugar Mill

## ISIS CENTRAL SUGAR MILL PROFILE

- Management offices: Brisbane and Cairns
- Operations sites: Childers, Isis and Maryborough
- Transportation fleet of 30 trucks travel upto 250KM
- Relied on a conventional mix of UHF/VHF radios and mobile phones
  - Experiencing communications dead spots
  - Inefficient 1 to 1 communications
  - Traffic office was receiving on average 150 phone calls in 12 hours



## MCX IMPLEMENTATION

- MCX to connect the teams with 1 to many calls
- Minimal infrastructure across a vast operations
- Workflows at the Control Room were also streamlined, making it possible to coordinate activities across sites
- Integrated GPS functionality allowed the Control Room operators real-time visibility via GPS tracking of their truck's locations

## KEY BENEFITS

- Increased operational outputs from 2300 to 3200 tonnes a day after implementing MCX
- This has significantly improved team collaboration from 1:1 calls to 1:many
- Enabled real-time contact with harvesters, facilitating efficient dispatch of vehicles
- Reduce fleet of devices
- No dead spots across the operations

# Video of ISIS Sugar Mill if time permits.

<https://video.motorolasolutions.com/detail/video/6348236747112/wave-ptx---enhancing-business-operations-at-isis-central-sugar-mill>

## Our Contact Details

ACCF/TCCA: : [admin@criticalcommsforum.com.au](mailto:admin@criticalcommsforum.com.au)



### Forthcoming TCCA Event

Critical Communications World  
2025

SAVE THE DATE 17 – 19 JUNE  
2025

[https://www.critical-  
communications-world.com/](https://www.critical-communications-world.com/)