



P25 Standards Update and Future Projects; JLMRLTE (LMR-Broadband) Interworking Update.

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P25/TIA TR-8 Introduction.



- To date, TIA TR-8 (Mobile and Private Radio Engineering Committee) has created and maintains all documents included in the P25 Suite of Standards (80+ documents).
 - Air Interfaces - Frequency Division (FDMA) for trunking/conventional voice and packet data services and Time Division (TDMA) for trunking voice and control channel;
 - Wireline Interfaces - Inter Sub System Interface (ISSI), Console Sub System Interface (CSSI) and conventional Fixed Station Interface (FSI);
 - Security services; Over the Air Rekeying (OTAR), Subscriber Authentication, AES256 Voice and Data Encryption;
 - Location services; Tier 1 (conventional) and Tier 2 (trunking or conventional)
- Standards enable interoperability between equipment of different manufacturers.
 - User agencies (via User Needs Working Group (UNWG)) and/or customer Request for Proposals (via manufacturers) identify interfaces and functionality that need to interoperate;
 - Manufacturer and user agency representatives work together to create TIA standard documents;
 - Customers choose what standard functionality they desire, manufacturers build to the standards that support their customers and standard tests validate interoperability of manufacturer implementations.

Summary of Improvements and Ongoing Work: P25 Air Interface Standards.



- **New Remotely Activated Emergency for Trunking and Conventional.**
 - Intended for use when a subscriber user is in an emergency situation and is unable to initiate an alarm request (example; downed firefighter) and an alarm is remotely activated. This feature informs other users of this situation.
 - **Published: Feb2025.**
- **New Location on Push to Talk feature for Trunking.**
 - This feature embeds location information in trunking voice transmissions for use by a mapping application.
 - **Published: FDMA operation;**
 - **Approved to Publication: TDMA operation Feb2025.**

Summary of Improvements and Ongoing Work: P25 Air Interface Standards. (2)



- **New User Alias Download feature for Trunking.**
 - Allows radios to translate the standard defined numeric identities received during voice calls to a system operator defined alphanumeric alias to improve the radio operator's awareness of who they are listening to in a call.
 - **Published: FDMA operation;**
 - **Approved to Publication: TDMA operation Feb2025.**
- **Improving documentation for modeling noise and interference and for coverage modeling and verification.**
 - Now addresses interference issues for radios in proximity of short-tower cellular systems at 700/800 MHz, RF penetration through low-emittance (so-called "green") glass and additional factors for Coverage Acceptance Plans (CATPs).
 - Clarifies Delivered Audio Quality verification methods.
 - **Drafting:** Recommended Methods for Measurement and Interference Assessment for Narrowband In-building Coverage Enhancement Systems.

Summary of Improvements and Ongoing Work: P25 Security Standards.



- **New standard capabilities for P25 Key Fill Devices.**
 - Standardized Interoperability of the Key Fill interface for End-to-End and Authentication key material provisioning between KMFs/Authentication Facilities, KFDs, and portables/mobiles.
 - Ballot completed Dec2024; review of ballot comments in progress.
- **Improved Interoperability for End-to-End encryption key sharing between Key Management Facilities (KMFs).**
 - Security enhancements and clarifications for increased interoperability; published Jul2024.
 - Published: Use of Transport Layer Security (TLS) version 1.3 Dec2024.
- **OTAR Messages and Procedures Improvements.**
 - **Planned New Work:** Project approved to revise OTAR Messages and Procedures Cipher-based Message Authentication Code (CMAC) examples.

Summary of Improvements and Ongoing Work: P25 Security Standards. (2)



- **New P25 Link Layer Encryption service protecting all air interface signaling.**
 - **Drafting:** Users and manufacturers are working together in the APCO Project 25 Interface Committee's Encryption Task Group to define the service.
 - This service will selectively encrypt air interface signaling and be interoperable with legacy air interface signaling.
 - This new system level service will affect nearly all published Air Interface standards in addition to published Security and Wireline Interface standards.
- **Improved operation of Mutual Authentication.**
 - State of PA noted they had issues when a radio attempted mutual authentication on an infrastructure that did not support mutual authentication;
 - **Planned Work:** A New Project has been approved to address this issue.

Summary of Improvements and Ongoing Work for: P25 Wireline Interface Standards.



- Control of “Group Regrouping” across the Inter Sub System Interface (ISSI) and the Console Sub System Interface (CSSI).
 - **Drafting:** Group Regrouping maximizes efficient use of RF resources when talkgroups are patched together. This new work will enable control of the Air Interface signaling when systems are connected with an ISSI or have dispatch equipment connected with a CSSI.
- Standard revisions for Emergency Group Call and Cancel.
 - **Drafting:** Clarifications of signaling and associated equipment behaviors to enable new test cases.
- New Interoperability and Conformance tests for ISSI and CSSI.
 - **Planned Work:** New Trunking Interoperability and Conformance tests include tests for vocoder mode combinations and Supplementary Data Services such as Call Alert and Emergency Group Call Cancel.

Summary of Improvements and Ongoing Work for: P25 Wireline Interface Standards. (2)



- Modifications to the Inter Sub System Interface (ISSI), the Console Sub System Interface (CSSI), and the Digital Fixed Station Interface (DFSI) to enable future Interworking with Broadband Cellular Public Safety Systems.
 - **Published:** ISSI/CSSI addendums defining use of the ISSI/CSSI for connecting Trunking systems to a 3GPP Inter Working Function (IWF).
 - **Drafting:** DFSI addendum defining use of the DFSI for connecting Conventional or Analog FM base stations to a 3GPP IWF.
 - **Planned New Work:** Addendum to the P25 Conventional ISSI/CSSI standard for connecting P25 Conventional or Analog FM base stations to a 3GPP IWF.
- New feature for Remotely Activated Emergency Alarm.
 - **Planned New Work:** Considers control signaling across an Inter Sub System Interface (ISSI) and Console Sub System Interface (CSSI) to activate a radio's emergency alarm.

ATIS/TIA JLMRLTE Working Group.

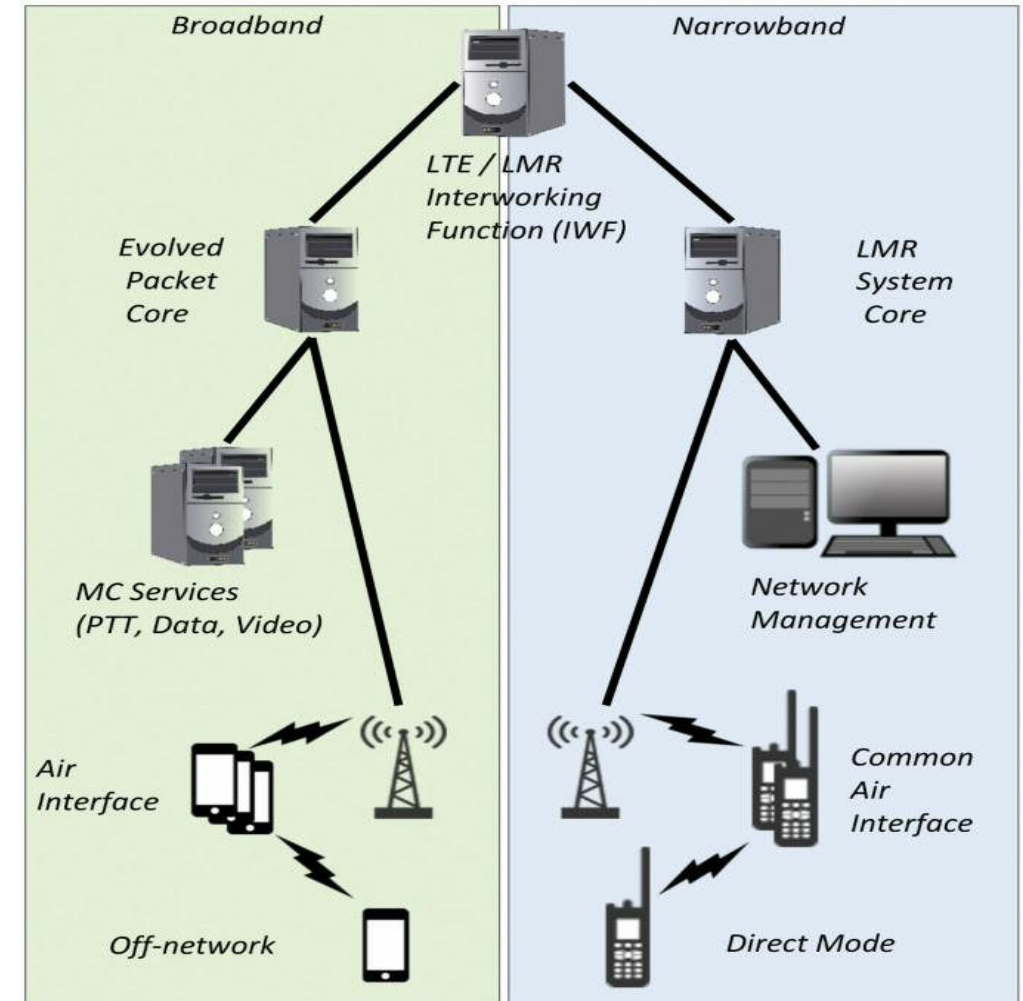


- **Current work item:** “Study of Interworking between P25 LMR and 3GPP (MCPTT) Mission Critical Services”.
 - This document contains scenarios and considerations for the use of a 3GPP Release 15 Inter Working Function (IWF) to enable interoperability of standardized voice and data services between a 3GPP Mission Critical system and a TIA-based LMR system.
 - **The TIA-based LMR systems included are:**
 - P25/TIA-102 Trunking;
 - P25/TIA-102 Conventional;
 - TIA-603 Analog Conventional FM.
- The Study document does not prescribe a particular LMR interface to the IWF;
 - TIA has chosen the P25 Inter-RF Subsystem Interface (ISSI) and Digital Fixed Station Interface (DFSI).
- **The Phase 7 Study document was published by ATIS/TIA March 14, 2025.**
- **Planned New Work: Phase 8.**

LMR/LTE Inter Working Function.



- The 3GPP Interworking architecture defines an interworking functional entity (IWF).
- From the 3GPP side, the IWF acts as another 3GPP mission-critical system, and from the LMR side, the IWF acts as another LMR system.
- The IWF is the functional entity responsible for conversion of media, identities and control signaling between 3GPP mission critical and LMR technologies to enable interoperable services.
- This IWF supports interworking between LMR systems and 3GPP mission critical systems using standard TIA LMR interfaces and the standard 3GPP IWF interfaces.
- For LMR, the P25 Inter-RF Subsystem Interface (ISSI/CSSI) and Digital Fixed Station Interface (DFSI) have been chosen by TIA.
- End to End encryption is supported.



P25 LMR & Broadband: Better Together.



**P25 LMR and Cellular broadband (FirstNet) are different Technologies;
You do not need to choose one or the other.**

P25 LMR and Broadband are Better Together!

- The rollout of 3GPP broadband services is expected to continue to progress.
- There will likely be an extended period of time where both technologies exist in the market.
 - This period of coexistence creates a need for Interworking of these technologies.
- The joint ATIS/TIA working group will continue to expand the Study document to enable interworking of the technologies and migration to broadband technology.
- Work will continue in TIA to maintain and update P25 standard services.
- Work will continue in 3GPP to maintain and update 3GPP mission critical standard services.



THANK YOU!



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