IWCE WEBINAR
September 19    2:00 PM ET

Project 25 Mission Critical PTT
Capabilities and Benefits

Presented by:
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Project 25: Summary

- Designed for public safety by public safety
- P25 is a suite of mobile radio standards and bulletins which define interoperable communications.
- Developed in partnership between Public Safety and TIA
  - Project 25 formed in 1989
  - Initial standards released in 1995
  - Original goals have been met
  - Ongoing development and evolution of the standards continue with broad industry support
The Project 25 Eco-System Today

Established Base of over 2250 Project 25 Systems on the air today
Including 37 Statewide P25 Systems, numerous region wide, county wide, municipality, campus, and individual facility 25 systems.
Examples: Michigan 90,000 users 1,665 Agencies 12 Million PTT /mo.
               Miami/Dade 30,000 users, 110 Agencies, 7 million PTT/mo.

A Vibrant Competitive Market-place with 40 Project 25 Product and Service providers offering a diverse range of P25 solutions at multiple price points and P25 is the preferred technology for Federal Grants

Independent Testing through the DHS CAP Program and a number of certified independent testing Labs.

A Live, Active, Evolving Technology that continues to develop with new capabilities, upgrades, and test standards
40 Vendors for Project 25 Equipment and Services

Available in VHF, UHF, 700, 800, and 900 MHz

16 Fixed station/repeater suppliers

15 Subscriber suppliers:

Mobiles, Portables, Vehicle Repeaters, Pagers

13 Console suppliers

16 Network providers

7 Test equipment suppliers

11 Consultant services
Why have so many PTT Users chosen P25?

**Superior Interoperability**

**Multiple Air Interfaces:** P25 offers interoperable FDMA and TDMA Common Air Interfaces and products that are backwards compatible with legacy Air Interfaces.

**Multiple Wireline Interfaces:** P25 has well defined Wireline Interfaces to link: P25 Systems (ISSI), Consoles to P25 Systems (CSSI), Conventional Stations to P25 Systems (FSI)

**Frequency Agnostic Operation in Multiple Bands:**
- VHF 136-174 MHz, UHF 380-512 MHz, 700/800/900 MHz
Key Project 25 Interfaces

P25 has standardized the Common Air Interface (CAI) and multiple Wireline Interfaces

- Common Air I/F(CAI): Trunking
- Key Fill Interface
- Inter KMF Interface
- Packet Data Host Network Interface
- Mobile Data Peripheral Interface
- Inter Sub-System Interface (ISSI)
- Fixed Station Interface (FSI)
- Console Interface
- RF Sub-System 1
- RF Sub-System 2
- CAI: Conventional

August 2017
Project 25 Technology Interest Group
Why have so many PTT Users chosen P25?

**P25 Interoperability Use Cases**

- The P25 ISSI permits roaming to a neighboring system while maintaining home system contact. (This may be a model for Cellular PTT interface)
- Reliable “Radio to Radio” P25 Direct Connections using the P25 Common Air Interface (CAI) when Infrastructure is down or overwhelmed
- Neighboring jurisdictions can communicate during a common event or vehicle pursuit and Outside agencies can respond for mutual aid.
- P25 radios can be programmed with National, Statewide, Regionwide Mutual aid talk interoperability talk groups for use in emergency/disaster events. These channels have been defined by FCC and NTIA and have common channel names developed by NPSTC. FCC requires P25 for 700 MHz interoperability channels
P25 Applications for Emergency/Disaster PTT Communications

- **P25 State-Wide Communications Systems**
  - Regional Interoperability Talkgroups Already Deployed
  - Organized as Homeland Security Regions
  - Standardized Interoperability Templates for Each Region
  - Program All Radios With All Interoperability Templates

Kansas Homeland Security Regions
and KDOT Tower Sites

- 1 – PSAP
- 2 – M/E (Medical/EMS)
- 3 – EOC (Emergency Operations Center)
- 4 – LE
- 5 – EMGT (Emergency Mgmt)
- 6 – FIRE
- 7 – EMS
- 8 – PWKS (Public Works)
- 9 – channel 9 and on are local channels specific to that region
P25 Applications for Emergency/Disaster PTT Communications

- User Considerations:
  - Mutual Aid Agreements:
    - Prepare Ahead
    - Regional ID Planning
    - Coordinate Encryption Keys
  - P25 Interfaces
    - CAI, Encryption and ISSI Enhance
  - V/U/800 Nationwide Interoperability Channels
    - Mix of Analog and P25
    - P25 Radios are Backwards Compatible with Analog
    - Greatest Common Denominator
  - 700 MHz Nationwide Interoperability Channels
    - FCC Mandates Use of P25
Why have so many PTT Users chosen P25?

Public Safety Grade Reliability and Performance

Developed through 25 years of Standards evolution and product technology improvements.

**Multiple P25 PTT Voice and Data Services:** Group Call, Emergency Group Call, Broadcast All Call, Unit to Unit Individual ID Call, Telephone interconnect call, Tier 2 Location (GPS), OTAP/OTAR. *All with talking party ID*

**Feature Rich Supplementary Services:** Call Alert, Status Message/Status Update, Radio Check, Radio Unit Monitoring, Radio inhibit/Uninhibit, Priority/Preemptive Priority

**Superior Voice Encryption and Security** using 256 bit AES Encryption, Over the Air Re-Keying, and Authentication.

**High Performance Audio Volume and Clarity (P25 Vocoder)** combined with rugged housings that are designed for demanding Public Safety environments
P25 Encrypted Interoperability

Identify & Adopt Best Practices for Encryption

- SAFECOM/FPIC/NCSWIC
- P25 LMR Encryption Parameter Overview
- Key ID
- Traffic Encryption Key (TEK)
- Storage Location Number (SLN)
- Algorithm ID
- Recommended Best Practices
- Improved Coordination
- National SLN Assignment PLAN
Why have so many PTT Users chosen P25?

**Project 25 is Cost Effective**

**Multiple System Configurations:** P25 offers: direct mode, repeated, single site, multi-site, voting, multicast, and simulcast configurations allowing scalable, cost effective, system design.

**Sharing P25 Infrastructure** P25 permits multiple agencies to share common infrastructure and each make their own purchasing decisions.

**Statewide and Regionwide P25 Systems are growing rapidly** as smaller agencies realize the benefits of eliminating their LMR operating costs and getting improved coverage and performance of P25.

**P25 is the preferred LMR technology for Federal Grants**

**40 Project 25 Product and Service providers compete for Standards based RFPs**
Federal Agencies Continue to Support Project 25 (DHS OEC briefing IWCE 2018)

Mission Critical voice land mobile radio is going to be around for a long time
Project 25 is the best choice for interoperability
Most federal agencies are committed to Project 25

- P25 is the recommended technology of choice for interoperability in the SAFECOM Grant Guidance and the DHS NECP
- DHS actively participates in the P25 development process and currently chairs the P25 Steering Committee

P25 offers a robust PTT capability set including: Group calls, Individual Calls, Voice, Data, Location, all with optional full AES end to end encryption and authentication.

The P25 standard was originally defined and continues to evolve based on Radio User input and direction.

There is broad support for the use of P25 Standards and Technology for Interoperable Communications from: DHS, SAFECOM, NPSTC, DoD, and 40 P25 Commercial Product manufacturers and Service providers.