



NPSTC Meeting IWCE | Las Vegas, NV

Friday, March 25, 2016

Call In: (510) 227-1018 | Conference ID: 192 7086

Webinar Access Information : <https://join.me/NPSTCsupport1>

Submit Questions Online
Send email to support@npstc.org

The member organizations of the National Public Safety Telecommunications Council are grateful to the Department of Homeland Security's Science and Technology Directorate, Office for Interoperability and Compatibility (OIC) and the National Protection and Programs Directorate, Office of Emergency Communications (OEC) Points of view or opinions expressed are those of the originators and do not necessarily represent the official position or policies of the U.S. Department of Homeland Security.



Executive Session Level Four

Executive Session Level Four

- Level 4
 - NPSTC Chair
 - NPSTC Vice Chairs
 - Committee Chairs and Vice Chairs
 - Voting Organization's Representative and Alternate
 - Executive Director
 - Deputy Executive Director



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Welcome and Opening

- Doug Aiken, NPSTC Vice Chair
 - Call to Order
 - Pledge of Allegiance



Pledge of Allegiance



Role Call

Governing Board Organizations



- American Association of State Highway Transportation Officials (AASHTO)
- American Radio Relay League (ARRL)
- Association of Fish & Wildlife Agencies (AFWA)
- Association of Public-Safety Communications Officials-International (APCO)
- Forestry Conservation Communications Association (FCCA)
- International Association of Chiefs of Police (IACP)
- International Association of Emergency Managers (IAEM)
- International Association of Fire Chiefs (IAFC)
- International Municipal Signal Association (IMSA)
- National Association of State Chief Information Officers (NASCIO)
- National Association of State Emergency Medical Services Officials (NASEMSO)
- National Association of State Foresters (NASF)
- National Association of State Technology Directors (NASTD)
- National Council of Statewide Interoperability Coordinators (NCSWIC)
- National Emergency Number Association (NENA)
- National Sheriff's Association (NSA)

Welcome

- Associate Organizations
 - Canadian Interoperability Technology Interest Group (CITIG)
 - Utilities Telecom Council (UTC)

- Affiliate Organizations
 - Alliance for Telecommunications Industry Solutions (ATIS)
 - Open Mobile Alliance (OMA)
 - Telecommunications Industry Association (TIA)
 - TETRA Critical Communications Association (TCCA)

Welcome

- Liaison Organizations
 - Federal Communications Commission (FCC)
 - Federal Emergency Management Agency (FEMA)
 - Federal Partnership for Interoperability Communications (FPIC)
 - National Telecommunications and Information Administration (NTIA)
 - Public Safety Communication Europe (PSCE)
 - SAFECOM Program
 - U.S. Department of Homeland Security, Office for Interoperability and Compatibility (OIC)
 - U.S. Department of Homeland Security, Office of Emergency Communications (OEC)
 - U.S. Department of Justice (US DOJ)
 - U.S. Department of the Interior (US DOI)
 - University of Melbourne Center for Disaster Management and Public Safety (CDMPS)



FirstNet NPSBN Development

FirstNet NPSBN Development



- FirstNet
 - TJ Kennedy, President
 - Kevin McGinnis, FirstNet Public Safety Board Member
- Public Safety Advisory Committee
 - Harlin McEwen, Chair



Federal Partners Update

Federal Partners Update



- Department of Homeland Security (DHS)
 - John Merrill, Director, Office for Interoperability and Compatibility (OIC)
 - Chris Essid, Deputy Director, Office of Emergency Communications (OEC)



Next Generation First Responder

National Public Safety Telecommunications Council Meeting
March 25, 2016



**Homeland
Security**

Science and Technology

John Merrill

Director

Office for Interoperability and Compatibility

Department of Homeland Security

Science and Technology Directorate



NEXT GENERATION FIRST RESPONDER

PROTECTED

CONNECTED

FULLY AWARE



**Homeland
Security**

Science and Technology



PROTECTED

Defending against life-threatening hazards

- Enhanced Duty Uniforms and PPE
- Fire, Tear and Splash Resistance
- Biohazard Resistance
- Wearable Chemical and Gas Sensors
- Physiological Sensors
- Radiological Sensors

CONNECTED

Having a lifeline when it's needed most

- Communications Hub
- FirstNet Public Safety Broadband
- Interoperable Data Standards
- Mesh Networks
- Mobile Ad Hoc Networks
- Personal Area Networks
- Deployable Micro-Satellites
- Deployable UAS Networks
- P25 Compliance Assessment Program

FULLY AWARE

Making informed decisions that save lives

- Heads-Up Display
- Blue Force Tracking
- Next Generation Incident Command
- Internet of Things Integration
- CCTV and Traffic Cameras
- Alerts, Warnings and Notifications
- Mutual Aid Resources
- Data Prioritization and Analysis
- Building Plans and Schematics
- Location-Based Services
- On-Demand Vehicle Status
- On-Demand Hospital Status



*Why does this **mission** matter?*

Helping responders get on scene

FASTER

with the information they need to save lives



**Homeland
Security**

Science and Technology



What are we working on?

Current NGFR Projects

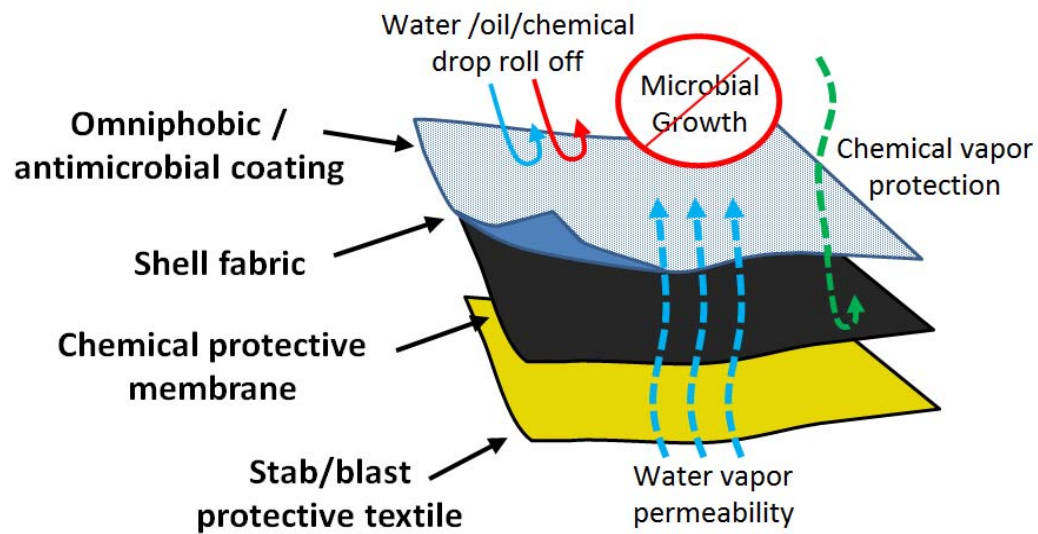


**Homeland
Security**

Science and Technology

Multi-Threat Base Ensemble

Resisting blood, fire, liquid, biological and chemical hazards, and punctures



Homeland Security

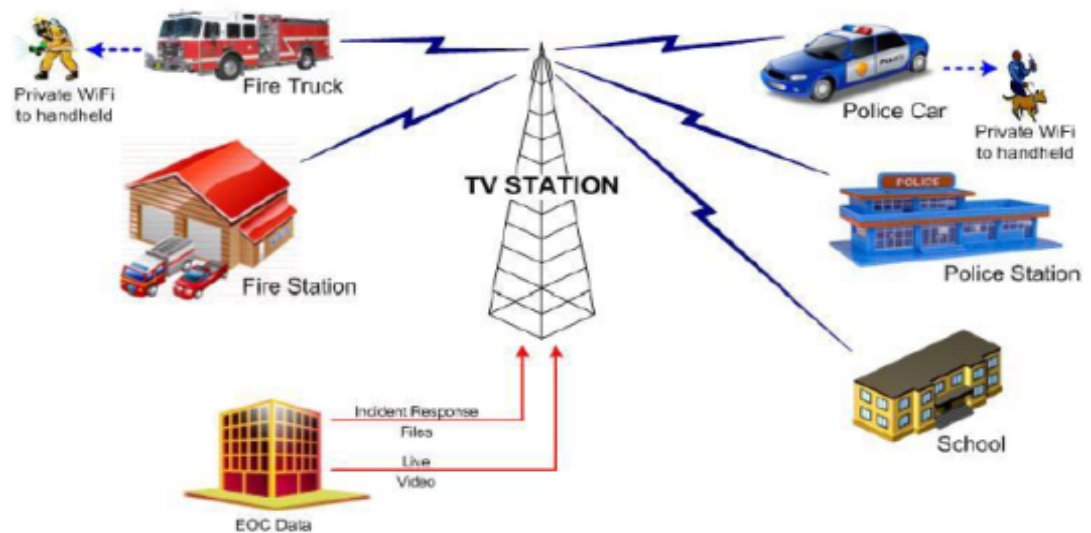
Science and Technology

Video Datacasting Project

Sharing large data files – building blueprints, videos, etc. – with first responders in the field using the public television spectrum



**Public Television enhances
public safety communications**
BROADCAST ONCE, RECEIVE ANYWHERE



**Homeland
Security**

Science and Technology

Incident Management Information Sharing (IMIS) Pilot

Harnessing Internet of Things capabilities to improve first responders' situational awareness during emergencies



**Homeland
Security**

Science and Technology

Public Safety Cloud Computing

Gathering stakeholder requirements to design, prototype and deploy an Initial Operating Capability of the Public Safety Cloud to benefit first responder organizations



**Homeland
Security**

Science and Technology

AUDREY

Synthesizing and analyzing big data – i.e., from sensors or dispatch centers – and pulling out information relevant to each responder in real time



**Homeland
Security**

Science and Technology

Project 25 Compliance Assessment Program

Ensuring the communications equipment that manufacturers declare to be P25 compliant meets P25 standards.



**Homeland
Security**

Science and Technology

EMERGE Accelerator Program

Working with accelerators to “speed up” the time to market for cutting-edge first responder wearable technologies.



**Homeland
Security**

Science and Technology

WANT TO LEARN MORE?

For more information on the
Next Generation First Responder Program, visit



FirstResponder.gov/NGFR

Email: john.merrill@HQ.DHS.GOV

Office: 202-254-5604



**Homeland
Security**

Science and Technology



Homeland Security

Science and Technology



Homeland
Security

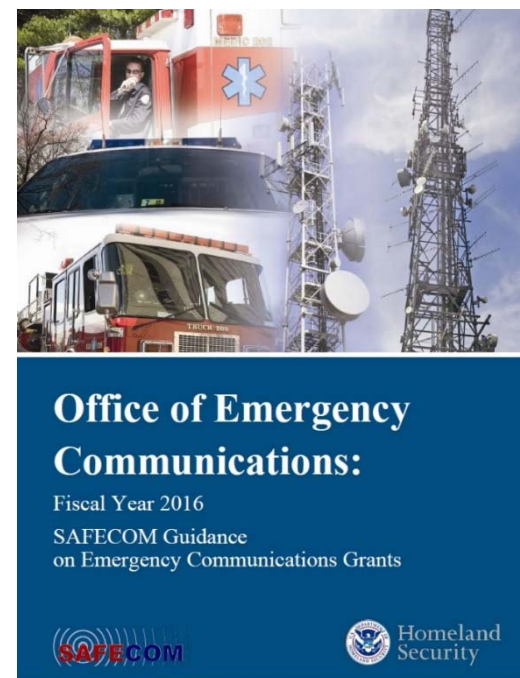
Office of Emergency Communications (OEC) Update

National Public Safety Telecommunications Council
In-Person Meeting
March 25, 2016

Chris Essid
Deputy Director
OEC

New Releases: Grant Guidance and LMR Trio

- Fiscal Year 2016 SAFECOM Guidance on Emergency Communications Grants
- Land Mobile Radio (LMR) Trio:
 - LMR 101, Part I: Educating Decision Makers on LMR Technologies
 - LMR for Decision Makers, Part II: Educating Decision Makers on LMR Technology Issues
 - LMR for Project Managers, Part III: A Project 25 Primer for Project Managers and Acquisition Managers



SAFECOM

NCSWIC

Land Mobile Radio (LMR) 101



**Homeland
Security**

Office of Emergency Communications

National Governors Association Policy Academy

- 2016 Focus: Enhancing Emergency Communications Interoperability
- Five competitively selected states will develop and present recommendations and plan of action to the governor
- 2006 NGA Policy Academy on interoperability resulted in the creation of:
 - DHS OEC
 - 2008 NECP
 - SWICs, SIGBs, & SCIPs
 - IECGP funding



Homeland
Security

Office of Emergency Communications

Interoperability Priorities for 2016 and Beyond

Strengthening
SCIPs, SWICs,
SIGBs, & COMU
programs

Measuring
response-level
communications in
urban areas

Exploring new
audiences for OEC
technical assistance

Enhancing federal
interoperability



Investigating
feasibility of
interoperability grant
funding



Homeland
Security

Office of Emergency Communications



Homeland Security



Homeland
Security

Office of Emergency Communications



Special Presentation

Founding Father – David Buchanan



Mt. McEwen





Break



Technology and Broadband Committee

**Tom Sorley, Committee Chair, *via teleconference* | Michael Britt,
Vice Chair**

Technology and Broadband Committee



- Public Safety Communications Research (PSCR)
 - Dereck Orr, Division Chief

Technology and Broadband Committee



- 3rd Generation Partnership Project (3GPP) Standards Update – Barry Luke, NPSTC Deputy Executive Director
 - Release 12
 - Release 13
 - Release 14
 - Release 15

Technology and Broadband Committee



- **3GPP Release 12**
 - Frozen 3-13-2015
 - Proximity Services (ProSe)
 - Off Network operations
 - Device discovery
 - Group Communications System Enablers for LTE (GCSE_LTE)
 - One to Many, One to All

Technology and Broadband Committee



- **3GPP Release 13**
 - Frozen 3/11/2016
 - Focus on mission critical voice Push to Talk over LTE
 - Requirements from the 2011 NPSTC Mission Critical Voice (MCV) Report were used
 - Additional requirements were added by the United Kingdom and others
 - Selection of vocoder was resolved
 - Wideband AMR is the sole mandatory vocoder
 - EVS vocoder in Super Wide Band (SWB) mode may be optionally adopted by a carrier
 - Isolated E-UTRAN Operations (IOPS)
 - Ability for an LTE Base Station to maintain service when connection to core is lost.
 - Similar to LMR Site Trunking

3rd Generation Partnership Project (3GPP) Standards Update *continued*



- Release 14
 - Work underway through June 2017
 - Complete work started in Release 13
 - Mission Critical Video (MCVideo)
 - Mission Critical Data (MCDData)
 - Mission Critical Services Common Requirements (MCCoRe)
 - Mission Critical Push To Talk over LTE - Realignment (MCPTT-R)
 - Creation of a standard interconnection between LMR and LTE
 - ATIS/TIA will then develop the LMR side of the connection, now that the LTE side has been formalized

Technology and Broadband Committee



- Release 15
 - Focused on 5G technology
 - Working to define use cases and requirements for 5G
 - Two major components to this effort:
 - Radio access network
 - Service aspects and system architecture
 - To date FirstNet has successfully inserted advanced requirements into both components to ensure public safety is relevant in 5G development
 - Starting this summer
 - Will react to any new public safety requirements that are identified for Mission Critical Voice

Technology and Broadband Committee



- Broadband Deployable Systems Working Group – Michael Britt
 - Claudio Lucente, Chair
 - Joint Working Group with Canada
 - Meets on the 2nd and 4th Tuesday at 11:00 am ET
 - This group is examining the role of deployable systems that support public safety broadband, including:
 - Back packs
 - Vehicle based networks
 - Aerial support units
 - Trailer systems

Broadband Deployable Systems Working Group, *continued*



- This group has completed the development of several incident based use cases which identify unique operational circumstances for deployable system use
 - Wild land fire in an isolated area
 - Large scale public event at a sports stadium
 - Additional capacity to support visiting foreign dignitary
 - EMS patient monitoring at the scene of a mass casualty incident
 - Search and rescue mission in a forest
 - Public safety response to an earthquake

Broadband Deployable Systems Working Group, *continued*



- The working group is finalizing a list of 45 Public Safety Requirements documenting needed functionality.

The DS shall be capable of operating with limited or absent backhaul providing essential public safety services locally.
The DS shall be capable to interface with satellite, microwave radio, and other backhaul technologies to provide the option for an alternative backup in the event the terrestrial infrastructure becomes unavailable due to natural or manmade disasters.
The DS solution shall accommodate the arrival and departure of active Deployable Systems,
A Deployable System shall provide or support backhaul to the NPSBN core network. This backhaul SHOULD be capable of providing sufficient bandwidth to the PSBN to support required public safety operations.
If a DS uses a Satellite system, it SHOULD include automatic alignment of satellite antennas.
The DS should support self-configuration to prevent system disruption when operating/activating near other fixed and DS systems.

Broadband Deployable Systems Working Group, *continued*



- The working group is finalizing a checklist to assist with the selection and ordering of the correct Deployable System for a given incident.

DEPLOYMENT ISSUES
Site Access:
The location of the DS site is accessible by paved/improved roadway (can support a towed trailer solution)
The location of the DS site is accessible by unimproved road. (can support an SUV or public safety vehicle based solution)
The location of the DS site is accessible by all-terrain vehicles only (no roadway)
The location of the DS site is not accessible by vehicle (deep woods, carry to top of building, etc.)
The location of the DS site is not accessible by foot (aerial solution needed)
Site Location:
The DS will be sited indoors (vs. outdoors)
The DS site will be located in an unusually harsh operating environment (describe: _____)

Technology and Broadband Committee



- Broadband Emerging Technologies Working Group, Kim Coleman-Madsen, Chair
 - Monitoring 3GPP standards activity
 - Scheduled updates on the UK and South Korea implementation of public safety broadband over LTE
 - Reviewing existing work on User Devices; Analytics and Sensors
 - Examining differences in how rural public safety agencies may utilize broadband systems
 - Reviewing how public safety agencies may utilize the FirstNet incident web status page.

Technology and Broadband Committee



- LMR to LTE Migration Working Group, Chris Kindelspire, Chair
 - Meets on the 1st and 3rd Wednesday at 12:00 noon ET.
 - Examine LMR and LTE interoperability.
 - Public safety agencies may be using LTE at the same time other adjacent agencies are continuing to use LMR systems.
 - Examine existing interoperability systems and technologies that are in use today.
 - Review the minimum requirements needed to support mission critical voice interoperability between LMR and LTE networks.

LMR to LTE Migration Working Group, *continued*



- Starting work on use case development
- Comparing 3GPP standards to expected operational requirements to determine what gaps may exist
- Examining the roles of LMR and LTE consoles
- Identifying different public safety LMR configurations that would need interoperability with LTE
 - Trunked, Conventional Repeater, Simplex

LMR to LTE Migration Working Group, *continued*



- Potential LMR-LTE Interfaces
 - ISSI (Inter RF Sub System Interface)
 - BSI (Bridging System Interface)
 - Hybrid backroom
 - LMR to LTE device tether
 - Wired
 - Bluetooth

Technology and Broadband Committee



- Unmanned Aircraft Systems (UAS) and Robotics Working Group, Michael Britt, Chair
 - Started in February 2016
 - Meets on the 2nd Wednesday of the month at 12:00 pm ET
 - Scheduling presentations from regulatory, industry and academia to get updated on the current state of this technology.

Unmanned Aircraft Systems (UAS) and Robotics Working Group *continued*



- Technology Adoption from the Military
 - Many technologies, devices and applications are adapted from military research and development



UAS and Robotics Working Group

continued



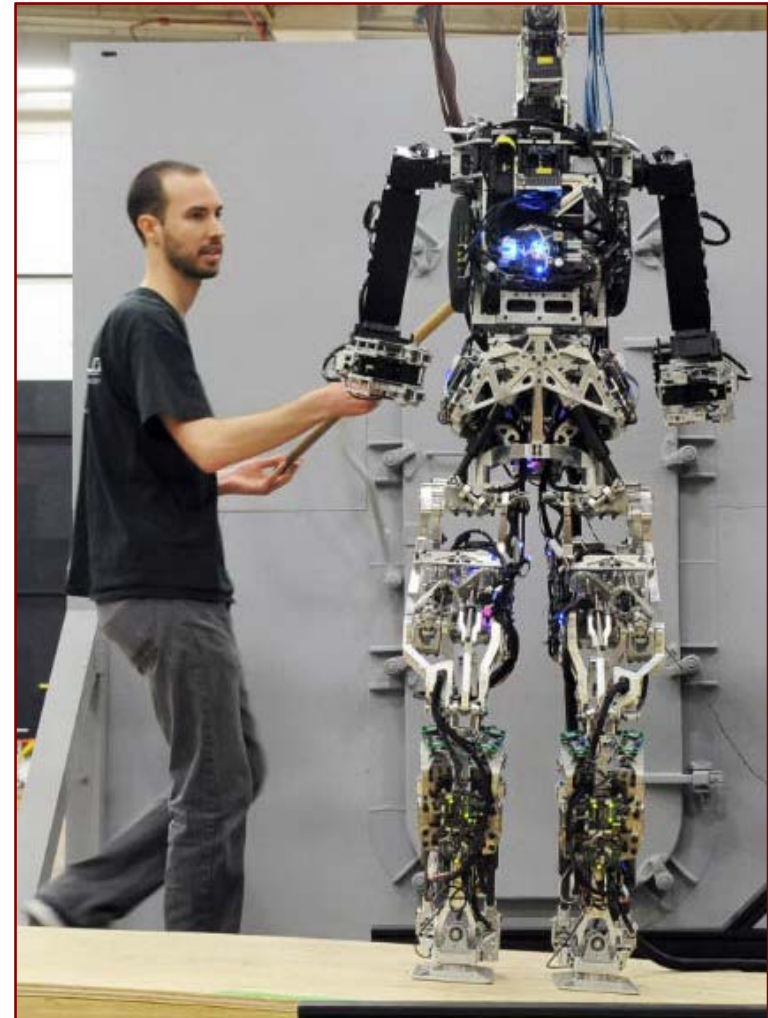
Navy spy "fish" could be operational next year

Mike Hixenbaugh
Dec 12, 2014



UAS and Robotics Working Group

continued



UAS and Robotics Working Group

continued



- Drones Public Safety Use
 - Medication Delivery



The first government-approved drone delivery took flight on Friday, in which an unmanned aerial vehicle successfully dropped medical supplies to a health clinic in rural southwest Virginia.

UAS and Robotics Working Group

continued



- Drones Public Safety Use
 - Life Guard Assist

Life-Saving Drones Could Be Headed To A Beach Near You

POMPANO BEACH (CBSMiami) – It's a race against time for a lifeguard trying to rescue a swimmer in trouble—**a race perhaps a life preserver-carrying drone can win.**



UAS and Robotics Working Group *continued*

- Impact on the Public Safety Answering Point (PSAP)

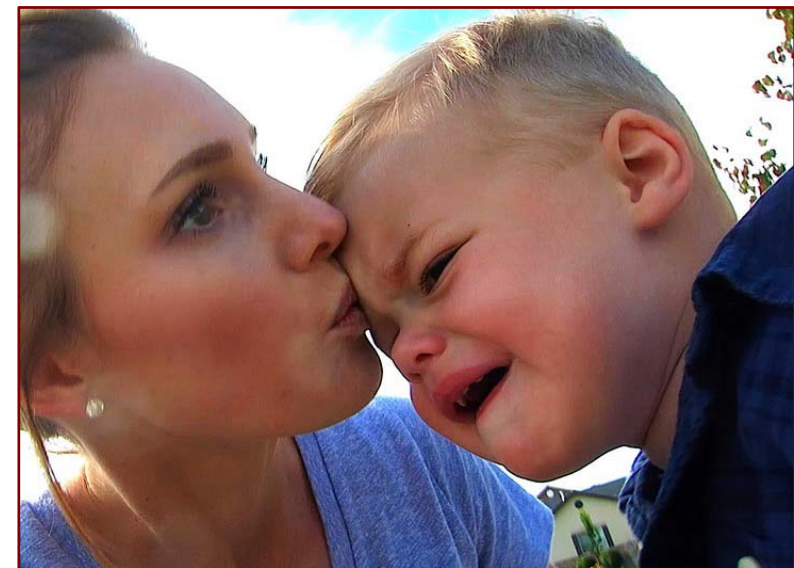


The ambulance drone that could save your life: Flying defibrillator can reach speeds of 60mph

- \$19,000 drone tracks emergency mobile calls and uses the GPS to navigate
- Operators can watch, talk and instruct those helping the victim by using an on-board camera

UAS and Robotics Working Group *continued*

- Impact on the PSAP





Technology and Broadband Committee

- Video Technology Advisory Group (VTAG), John Contestabile
 - VTAG maintains close association with VQiPS (Video Quality in Public Safety) working group of DHS
 - VAPS (Video Analytics for Public Safety) community of interest – New group stood up to address video analytic – John Garofolo (NIST) Chair
 - End user requirements
 - Usage across the Federal enterprise
 - Research needs/standards
 - Face to face meeting on June 6, 2016 in association with the PSCR workshop in San Diego
 - *Video Design Improvement Process and Efficient Bandwidth Utilization* reports soon to be published on www.firstresponder.gov

Video Technology Advisory Group (VTAG) continued

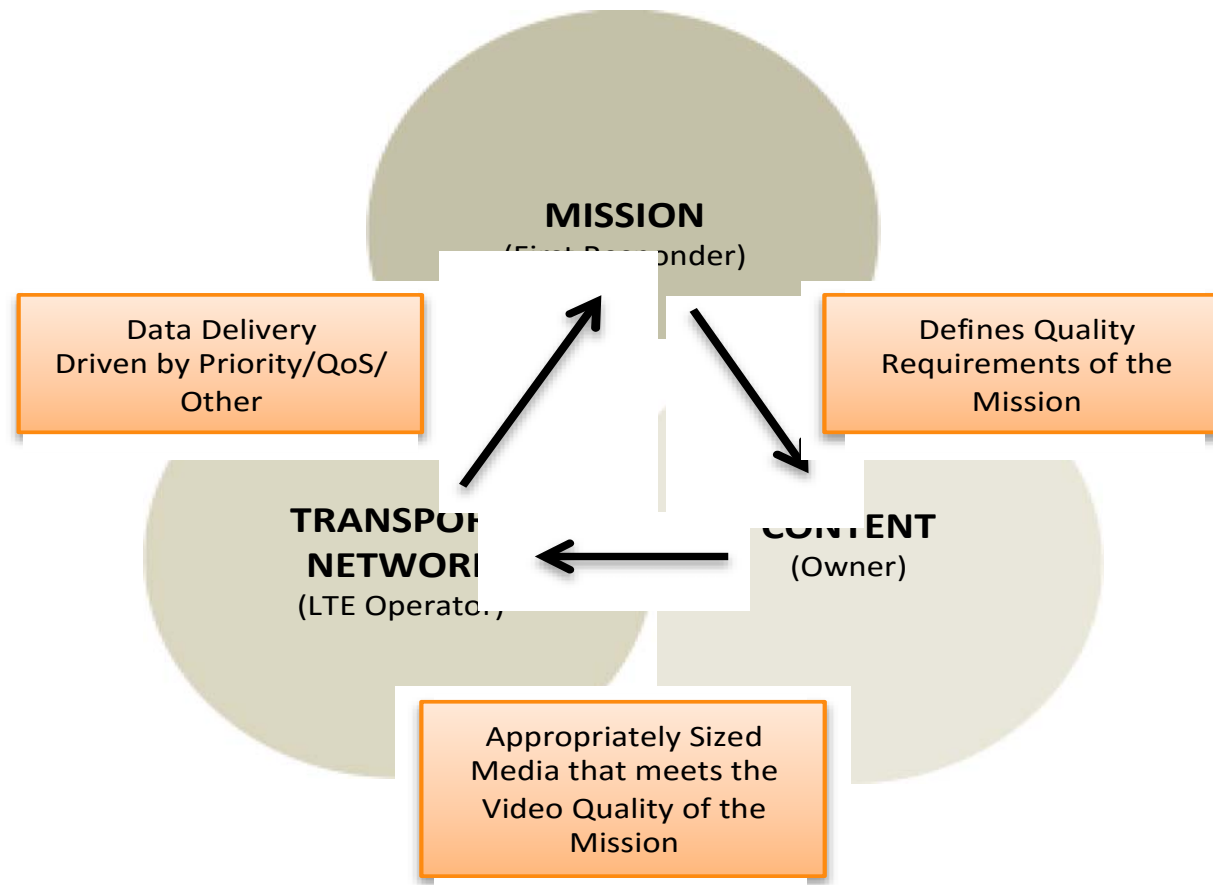


- Video Policy Guidance
- “Policy Considerations for the Use of Video in Public Safety” under development (Spring/Summer 2016)
- Will address several important areas:
 - Privacy
 - Security
 - Transparency
 - Technical
 - Interoperability
 - Access and Use (real time and forensic)
 - Retention
 - Notice
 - Dissemination
 - Governance

Video Technology Advisory Group (VTAG) continued



- Efficient Network Utilization and Video Design Improvement Process Reports



Video Technology Advisory Group (VTAG) continued



- VTAG maintains close association with other video related efforts
 - UL Tactical Video Standard – UL 3802
 - Lou Chavez (UL), Steve Surfaro (Axis), Garafolo, Contestabile involved
 - Maintain liaison with:
 - Broadband emerging technologies workgroup
 - LMR to LTE workgroup
 - UAS and Robotics workgroup
 - PSCR Visioning – Future research needs
 - Annual VQiPS workshop
 - *Tentatively* August 30-September 1 in *Seattle Wa.*
 - *VTAG next conference call on May 4, 2016 - 11am ET*

Technology and Broadband Committee



- Working Group Update – Michael Britt
 - Radio Programming Compatibilities Requirements (Radio PCR) Working Group
 - Dan Robinson, Co-Chair
 - Ken Link, Co-Chair
 - Working with the State of Colorado and the State of Michigan to beta test a State Specific PAM Tool implementation.



Topical Presentations

Project 25 PTIG Update

Steve Nichols, Director, Project 25 Technology Interest Group (PTIG)



**NPSTC General Meeting at IWCE
March 25, 2016**

Project 25 Technology Interest Group (PTIG) Update for 2016

**Presented by:
Stephen Nichols, Director PTIG
www.project25.org**

Project 25 Standards Update: January 2016



Completed in 2016:

General

- **A revision of TSB-102 (TIA-102 Documentation Suite Revision C)** was approved for publication. *The Telecommunications Systems Bulletin RevC reflects TR8 progress since the last publication (2012), including new TIA publications, improved graphics, and addresses miscellaneous errata identified.*

Air Interfaces

- **A revision to the FDMA, TDMA and Analog Air Interface Performance Measurement Method Standards** were approved for publication. *These revisions will ensure that harmonics present in Class D amplifiers do not interfere with various audio measurements.*

Broadband

- **A revision of TSB-88.2-E (Wireless Communications Systems – Performance in Noise and Interference Limited Situations – Part 2: Propagation and Noise)** was approved for publication. *The revisions add information associated with Broadband Air Interface Propagation and Noise modeling.*

Project 25 Standards Update: January 2016



Work in Progress:

Air Interfaces

- **A revision to the FDMA Common Air Interface Standard** is in progress. *This revision addresses errata that have been collected since the last publication.*
- **A revision to the Trunking Interoperability Test Standard** is in progress. *This revision merges the FDMA and TDMA material and address an error in a call pre-emption test procedure.*
- **A new standard for a TDMA Control Channel** is in progress. *This standard provides the messages and procedures for operating a 12.5 kHz channel with 2 TDMA slots where either or both may service Control Channel traffic.*

Project 25 Standards Update: January 2016



Work in Progress:

Security

- **Link Layer Encryption** is in progress. *This is the first big new technology upgrade for improved Security for all air interfaces of P25. It protects control channel control messages, and hides group and individual IDs.*
- **An addendum to the Key Fill Interface standard** is in progress. *This will enable Key Fill Device (KVL) interface to a KMF, an Authentication Facility and another Key Fill Device*

Wireline Interfaces

- **An addendum to the ISSI Messages and Procedures Standard** is in progress. *The revision corrects several errata that have been noted since the last publication.*
- **A revision to the Fixed Station Interface Standard** is in progress. *This revision adds additional capabilities the most significant of which is Packet Data.*
- **Additions to the Trunking ISSI Messages and Procedures Standard** are in progress. *The additions will add Individual and Group Regrouping capability associated with Console “Patch” type operations.*

Project 25 Standards Update: January 2016



Work in Progress:

Broadband

- **Public Safety requirements for Broad Band Data/LMR Interoperability** is in progress in a joint ATIS/TR8.8 effort. *This is the beginning of work to create the requirements for interworking of Broadband and Existing P25 LMR systems. This effort is currently on hold pending advancement of the 3GPP Mission Critical services architecture. A new ATIS ad hoc group has begun an effort to gather interworking requirements and scenarios for Broadband Mission Critical services and Land Mobile Radio Technologies such as Analog FM, P25 and Tetra.*
- **Additions to TSB-88** are in progress. *These additions will create recommendations for Broadband Data System coverage modeling and verification.*



The Latest News

- PTIG Releases Updated P25 Systems list with Australia, Canada, UK
- NEW Project 25 System of the Month: Monmouth County NJ

Upcoming Events

TIA TR-8 P25 Standards Meetings, San Diego CA

January 26 - 28, 2016

IWCE 2016, Las Vegas NV

March 21 - 25, 2016

APCO 2016, Orlando FL

August 14 - 17, 2016

PTIG Website Login

Welcome to the Project 25 Technology Interest Group

The Project 25 Technology Interest Group (PTIG) brings you this web site to provide information on all topics concerning Project 25.

Please register on the site for access to additional information. If you previously registered prior to June 2010, a new registration is required. This is to assure we have current and accurate information.

Registration is required to maintain a spam free site for you. No Fees are required for website registration.

PTIG MEMBERS NOTE: When your individual registration is validated for affiliation to a paid membership or a commercial member company, your registration will provide member access privileges.

Use the dialog box titled **"Contact Us"** on the home page for any inquiries about registration and membership.

This site is the official home of PTIG and our P25 community. Your suggestions and comments are always welcome. Use the dialog box titled **"Contact Us"** on the home page to make your suggestions, offer comments, or seek more information.

P25 System of the Month	P25 Steering Committee Approved List of Standards
P25 Frequently Asked Questions	P25 Feature Translator
P25 Standards latest Update	List of P25 Systems
P25 Capabilities Guide	

WWW.Project25.org

Project 25 Technology Interest Group (PTIG)



Documents available at www.Project25.org

- P25 Frequently Asked Questions (FAQ)

Written to officer, firefighter (non technologist) level

- P25 Capability Guide

Added Infrastructure interfaces and links to Statement of Requirements. Remains the best tool for managing P25 features and capabilities for system planning and RFP development

- P25 Standards Update Summary

Summary of the latest TIA TR-8 P25 Standards Meetings with user benefits defined

- P25 Steering Committee Approved List of Standards

Updated from the most recent P25 Standards meeting

- P25 Feature Translator

link to NPSTC PAM tool

Project 25 Technology Interest Group (PTIG)



New Documents available at www.Project25.org

- New White paper: P25 Automatic Roaming

A detailed description of Automatic and Manual Roaming capability for Project 25 systems.

- P25 System of the Month

Each month a new Project 25 system is featured describing the system, coverage, agencies served, interoperability achieved and other unique details of this application of Project 25 technology. Current Month Queensland Australia

- New White Paper: Is Project 25 Public Safety Grade?

Project 25 has been defined since it's inception by requirements from the Public Safety User Community. The result is a Suite of Standards with well defined features, capabilities, and interoperable interfaces applied in over 700 Public Safety Systems across the US today.

Project 25 Technology Interest Group (PTIG)



Projects Underway 2016:

- Expanded List of P25 Systems: New entries for International P25 systems and USA P25 Conventional systems will be added.

This resource will be expanded to include P25 systems beyond the systems currently listed for the USA, Australia, Canada, New Zealand, and the UK.

- FAQ Guide will be updated with latest Questions

CAP testing, CAP Certification, Automatic Roaming, Unit ID Duplication Questions.

- P25 Steering Committee By-Laws to be added as a resource

- Benefits of P25 Whitepaper

The Benefits of P25 Whitepaper is the most clicked on document on the PTIG WEB site. It was last updated in 2013. The new update includes additional Standards for ISSI, CSSI, and FSI and the benefits that they offer to users.

Project 25 Systems List



UNITED STATES P25 SYSTEMS

STATE	SYSTEM NAME	P25	P25	Comments	System User	Freq. Band
Alabama	Center for Domestic Preparedness	Phase 1			1st Responders	UHF Lo
	Dothan Public Safety	Phase 1			Public Safety	800
	Fort Benning Military	Phase 1			DOD	UHF Lo
	Fort Rucker	Phase 1			DOD	VHF
	Gadsden & Etowah County	Phase 1			Public Safety	700
	Jefferson County	Phase 1			Public Safety	800
	Marshall Space Flight Center	Phase 1			Fed Agency	UHF Lo
	8 Maxwell Air Force Base	Phase 1			DOD	UHF Lo
	Alabama First Responder Network		Phase 2		Public Safety	700/800
	Anniston Army Depot ANAD		Phase 2		Public Safety	UHF Lo
	3 Shelby County First Responders		Phase 2	New	Public Safety	

Project 25 Technology Interest Group (PTIG)



Other News at www.Project25.org

- **P25 CSSI logs over 5 Million Hours** *Zetron's Acom integrated dispatch system products utilizing the TIA Project 25 (P25) CSSI have logged more than 5 million hours of successful operation at customer sites throughout North and South America and Australia.*
- **New P25 Paging Solution to Improve Communications for First Responders in Michigan**
Currently, MPSCS subscribers may need two separate systems to dispatch emergency crews, one for the radios they use at the scene of an incident and another for the pagers that summon emergency responders. This new capability using Unications' P25 pagers will provide both functions in one single P25 system. Additionally, the new solution will notify first responders if they are out of communication range, a confirmation the current method does not
- **8 Suppliers Participate in P25 Trunked Interoperability Event**
- **Past P25 Systems of the Month:**
Miami/Dade County FL, Lexington KY, Monmouth County NJ

35 Vendors for Project 25 Equipment and Services

New P25 Pager and P25 Vehicle Repeater categories



- 15 fixed station/repeater suppliers
- 13 Subscriber suppliers
- 12 console suppliers
- 15 network providers
- 4 test equipment suppliers
- 7 consultant services



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

Project 25 Products and Services Available

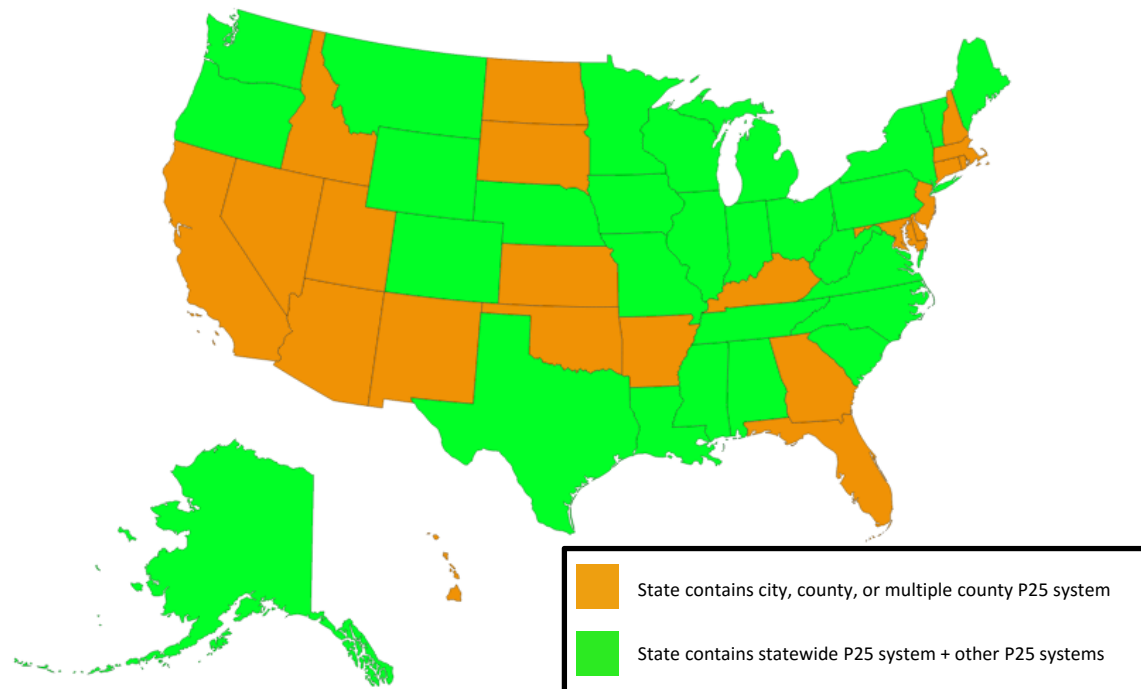


PTIG Member Organizations www.Project25.org	Fixed Stations & Repeaters	Mobile & Portable Radios	Pagers	Vehicle Repeaters	Consoles	Networks	Software	Test Equipment	Systems Integration	Consultant Services
AECOM										
AIRBUS DS COMMS										
AVTEC										
BAI (FORMERLY AIRWAVE)										
CATALYST										
CISCO										
COBHAM										
CODAN RADIO (FORMERLY DANIELS)										
DVA CONSULTING										
DVSI										
EF JOHNSON										
ETHERSTACK										
FEDERAL ENGINEERING, INC										
5 x 9 COMMUNICATIONS										
FUTURECOM SYSTEMS										
GENESIS GROUP										
HARRIS CORPORATION										
ICOM AMERICA										
IDA CORPORATION										
JVC KENWOOD										
MIDLAND RADIO										
MOTOROLA SOLUTIONS										
PANTEL INTERNATIONAL										
POWERTRUNK (TELTRONIC)										
RELM WIRELESS										
SIMOCO										
SPECTRA ENGINEERING										
STANDARD COMM PTY LTD - GME										
TAIT COMMUNICATIONS										
TECHNISONICS										
TELEX RADIO DISPATCH (BOSCH)										
TIMCO ENGINEERING										
UNICATIONS USA										
VERTEX STANDARD										
ZETRON										
35	15	13	1	4	12	15	6	4	17	7



Current Systems

- 700+ P25 trunking systems in all 50 states and US Territories
- 26+ Statewide P25 systems
- P25 Conventional Systems count TBD





Steve Nichols, Director
Project 25 Technology Interest Group

director@project25.org



Spectrum Management Committee

David Buchanan, Chair | Stu Overby, Vice Chair

Spectrum Management Committee



- Committee Update – David Buchanan
 - 4.9 GHz
 - 173 MHz Vehicular Repeater Systems (VRS)
 - FCC completed rulemaking decisions and approved LMCC recommended coordination procedures
 - FCC began accepting VRS applications March 15
 - P25 CAP Rule Change

Spectrum Management Committee

Update *continued*



- Awaiting Further Action by FCC:
 - Clearing of 700 MHz narrowband incumbents from 700 MHz broadband spectrum
 - FN, NTIA and DOC issued Announcement of Federal Funding Opportunity March 16 for Incumbent Relocations
 - ✓ 2016-NTIA-SRGP-01
 - ✓ Up to \$40M in funding available
 - ✓ Applications for funding due by May 16 to www.grants.gov
- Approval of LMCC coordination protocol for 800 MHz interstitial channels
- Opening of Railroad Police eligibility on Public Safety interoperability channels
- Wireless Bureau correction of proposed rules for airborne operations so Public Safety will not be impacted

Spectrum Management Committee



- Interference Protection Working Group Update – Don Root, Chair
 - Cellular Power Flux Density Rulemaking
 - Wind Turbine Farm Interference
 - Police Body Camera Interference

Spectrum Management Committee



- NPSTC T-Band Update – Stu Overby
 - Demand for spectrum virtually unchanged
 - Minimal change in supply of alternative spectrum
 - FCC prioritized 24 channels of 700 MHz reserve for T-Band relocation
 - TV/LPTV deployments on T-Band would greatly impact nationwide auction of the spectrum
 - Update report being finalized
 - SAFECOM developed T-Band executive briefing paper
 - T-Band issue raised in recent Congressional hearings

Spectrum Management Committee



- 5.9 GHz Issue Introduction – Stu Overby
 - 75 MHz at 5.9 GHz allocated for DSRC-“Dedicated Short Range Radio Service” for intelligent transportation & connected vehicles
 - Spectrum sought by Wi-Fi proponents for consumer use
 - No consensus on sharing; FCC pursuing studies
 - Full discussion at September NPSTC meeting



Federal Partners Update *(continued)*

Federal Communications Commission (FCC) – David Furth, Deputy Bureau Chief, Policy and Licensing Division, Public Safety Homeland Security Bureau (PSHSB) *via teleconference*



Topical Presentations

Ligado Networks (*formally known as Lightsquared*) – Geoff Stearn, Vice President of Spectrum Development

Ligado Networks Overview

March 25, 2016



Ligado Networks Company Overview

New Ownership and Board of Directors

- Company restructuring plan and FCC Change of Control Order approved in 2015
- Focus of new board and management team on fully resolving spectrum compatibility issues and working with stakeholders
- Working to deploy network providing next generation connectivity

Spectrum Holdings

- Spectrum licenses in the 1.5 GHz to 1.6 GHz band that include:
 - Ancillary terrestrial authority for L-Band spectrum
 - 5MHz terrestrially authorized in the 1670-1675 MHz Band
 - Dedicated satellite spectrum

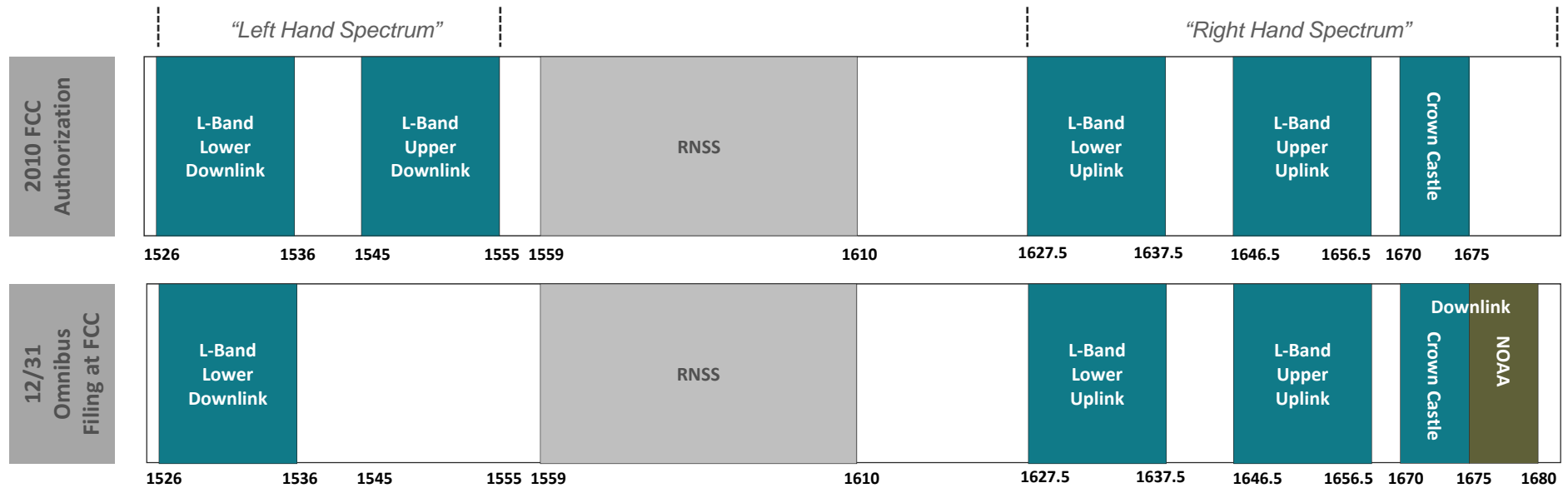
Network Operator

- Mobile Satellite Service (MSS) operations in North America since launch of MSAT-2 in 1995 and MSAT-1 in 1996
- Next-generation satellite, Sky Terra 1, launched in 2010 provides North American coverage for voice and data services

Company Products and Background

- Provider of MSAT Push-To-Talk and Voice, M2M, Broadcast Data, and GPS augmentation solutions
- Offices in Reston, Virginia and Ottawa, Canada

GPS and Mobile Broadband Coexistence



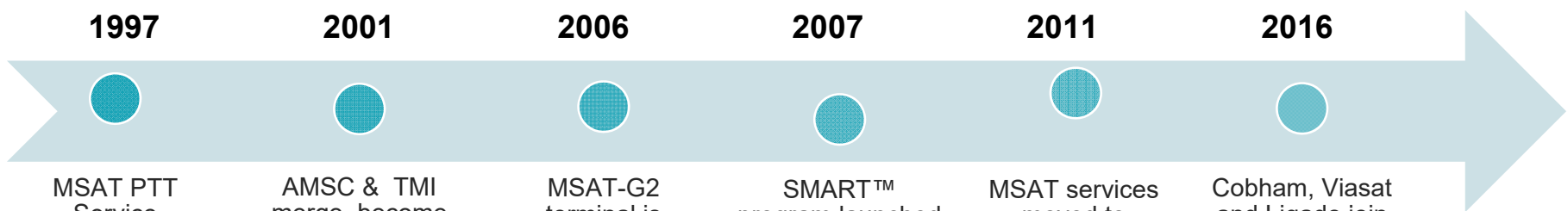
- Terrestrial authority for 1545-1555 MHz relinquished creating 10MHz guard band for GPS
- Reduced power levels and stronger OOB limits
- No remaining issues with "Right Hand Spectrum" for broadband use
- Technical issues on "Left Hand Spectrum" limited to certified aviation and MSS augmentation
- Placement of Ligado's license modification request on public notice by FCC will allow for the identification of any unresolved issues

Ligado's Service Offerings

Ligado Legacy of Push-To-Talk Connectivity

For 20+ years, Ligado has set the standard for Satellite PTT

- MSAT PTT is the solution of choice for First Responders and Enterprise users in emergency situations and for remote operations
- SMART™ Program:** Nationwide interoperable public safety talkgroups



1997
MSAT PTT Service Launches under TMI and AMSC brands



2001
AMSC & TMI merge, become MSV -- Sole provider of MSAT PTT



2006
MSAT-G2 terminal is introduced



2007
SMART™ program launched with Department of Justice and FBI



2011
MSAT services moved to SkyTerra 1 Satellite



2016
Cobham, Viasat and Ligado join forces to launch the EXPLORER MSAT-G3



9
3

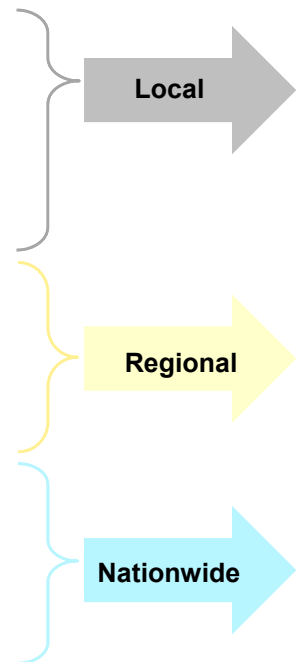
Talk Groups: Interoperability

Interoperability can be achieved by configuring and sharing talk groups

- Shared local and state talk groups already exist throughout North America
- Agencies and organizations are free to manage their talk groups
- Mutual aid talk groups have been established at the Local, Regional and National level



TWO WAY RADIO CONFIGURATION			
TAG	TG NAME	TG ID	M/C
1	CDC Atlanta	328230	High(3)
2	OPEO - Command	15138958	Med(1)
3	NPHST-1	328011	High(3)
4	NPHST-2	393547	High(3)
5	OPEO - Teams	852111	Med(1)
6	SESMART	852299	Low(0)
7	G-SMART	131403	Low(0)
8	SWSMART	917835	Low(0)
9	W-SMART	983371	Low(0)
11	E-SMART (EMS)	2556235	Low(0)
12	F-SMART (Fire)	2490699	Low(0)
13	L-SMART (Law Enf)	2621771	Low(0)
15	J-SMART	65867	Low(0)

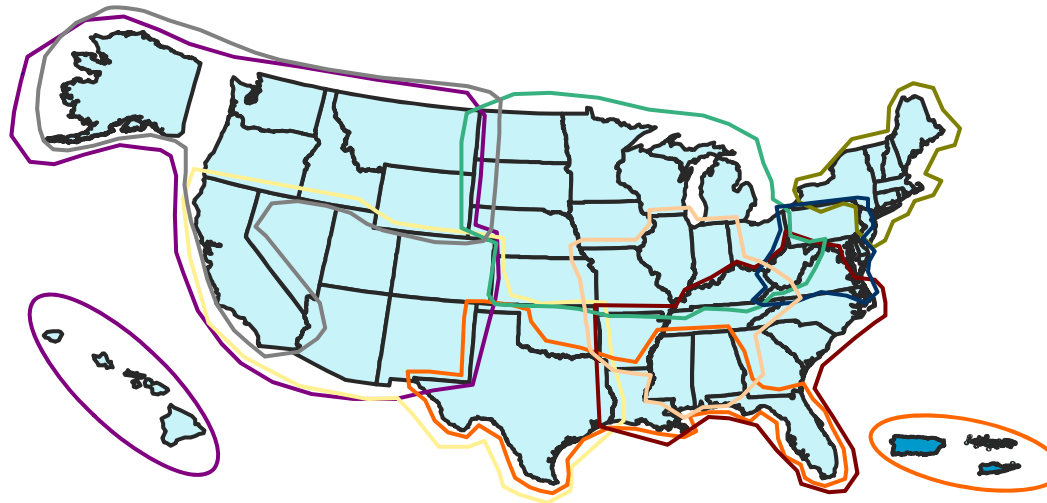


Agency Interoperability

Regional Interoperability

National Interoperability

Regional SMART™ Talkgroups



NESMART - CT, DE, MA, ME, NH, NY, NJ, PA, RI, and VT
 Manager: Connecticut State Police



MWSMART - IA, IL, IN, KS, KY, MI, MN, MO, OH, ND, NE, SD, WI, and WV
 Manager: IN Department of Homeland Security



M-SMART - DC, DE, MD, PA, VA, and WV
 Manager: Allegany County (MD) Dept. of Public Safety and Homeland Security



SWSMART - AZ, CA, CO, NV, NM, OK, TX, and UT
 Manager: Contra Costa County Fire Protection District



SESMART - AL, AR, FL, GA, KY, LA, MS, NC, SC, TN, VA, and WV
 Manager: Fairfax County (VA) OEM/Public Safety Comm.



W-SMART - AK, AZ, CA, CO, HI, ID, MT, NM, NV, OR, UT, WA, and WY
 Manager: California Emergency Management Agency



G-SMART - AL, FL, LA, MS, TX, PR, and VI
 Manager: LA Governor's Office of Homeland Security and Emergency Preparedness



NWSMART - AK, CA, ID, MT, OR, WA, and WY
 Manager: WA State Emergency Management Division



CUSEC-1 - AL, AR, IL, IN, KY, MS, MO, and TN
 Manager: Central United States Earthquake Consortium

National SMART™ Talkgroups



J-SMART & SMART-T – Public Safety
Manager: FBI Operational Technology Division



F-SMART - Fire Service
Manager: Seattle Fire Department



NPHST-1 / NPHST-2 – Public Health
Manager: KY Department for Public Health



I-SMART – Critical Infrastructure
Manager: Seattle Public Utilities



E-SMART – EMS
Manager: KY Dept. for Public Health



L-SMART - Law Enforcement
Manager: U.S. Marshals Service



U-SMART – Urban Search & Rescue
Manager: Montgomery County (MD) Fire & Rescue Service

MSAT Evolved – EXPLORER MSAT-G3 Push-to-Talk

Ligado Networks, Cobham SATCOM and Viasat have joined forces to bring to market EXPLORER MSAT-G3 PTT



Groundbreaking SkyTerra-1 satellite based network:

- Ubiquitous coverage throughout North America
- Dynamic satellite beam formation and system resource allocation
- 22 meter reflector enables use of smaller device form factors at higher data throughputs



Service Provider

All-IP Based Mobile Satellite Services Platform

- Multicast network
- Low Latency
- Embedded AES256 Encryption



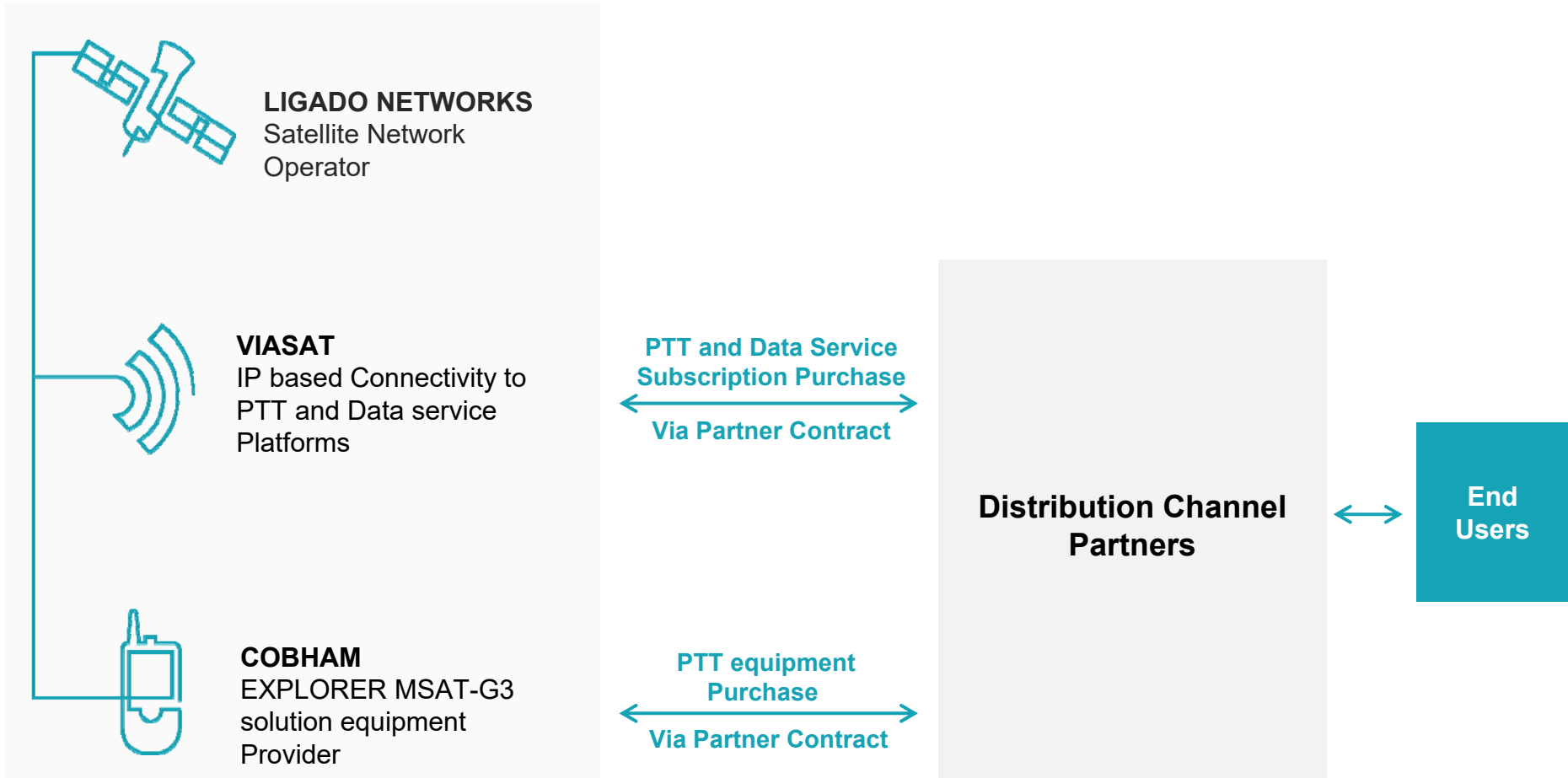
Equipment/Hardware Provider

EXPLORER MSAT-G3 Radio

- EXPLORER 122 IP Data Terminal
- EXPLORER PTT
- PTT Server Infrastructure



EXPLORER MSAT-G3 Distribution Overview



Next Generation IP Data Products – ViaSat and Ligado Partnership



Fixed / Portable
AT 2225



Mobile
AT 2220



MT 2220



Hot Spot
M2M/IoT



Embedded
Module
Chipset Module

Fixed and Mobile (Land, Air, Maritime) Designs	Bring your Own Device (BYOD) Enablement
<ul style="list-style-type: none"> • Smaller form factors, lower cost • Embedded GPS • WiFi, Bluetooth, Ethernet, and USB • Single and dual channel models • Land mobile and maritime enclosures being developed • NextGen voice and PTT Platform 	<ul style="list-style-type: none"> • Battery powered • Embedded connectivity • WiFi, Bluetooth, Ethernet, and USB interfaces • Cellular augmentation • Personal (consumer/prosumer) • Low cost device • M2M IoT modules

ViaSat IP Product Introduction will Enable the Transition of Legacy Customers to NextGen L-Band Platform

Conclusion

- Ligado has a track record of fostering integration and interoperability among various teams and workgroups at a local, regional, national and even international level
- We are committed to drive innovation in satellite, terrestrial and integrated networks
- New era of collaboration being driven by new ownership and leadership
- We especially look forward to continuing to demonstrate our commitment to public safety communications at all levels



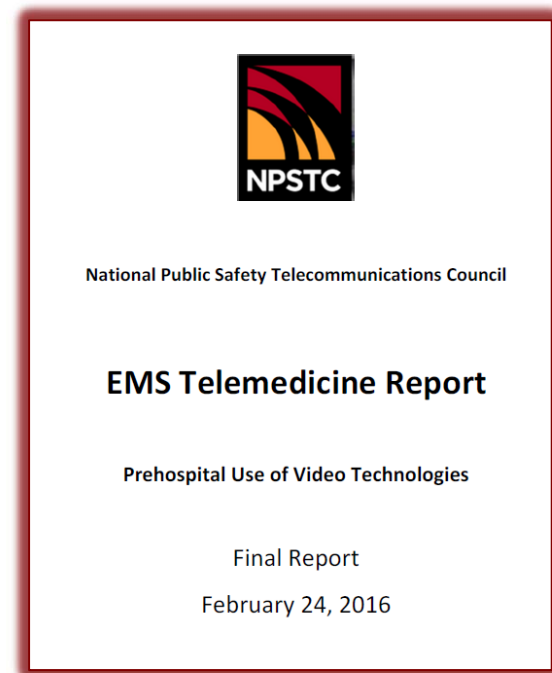
Interoperability Committee

John Lenihan, Interoperability Committee Chair | Don Root, Vice Chair

Interoperability Committee



- Working Group Update – John Lenihan
 - Emergency Medical Services (EMS) Working Group
 - Paul Patrick, Chair
 - EMS Telemedicine Report has been approved and distributed
 - 2016 work plan is being finalized



Interoperability Committee



- Working Group Update – John Lenihan
 - Common Channel Naming Working Group
 - Don Root, Chair
 - 2016 Revision in progress
 - Currently reviewing public comments received

The logo for APCO International, featuring the text "APCO International" in a serif font, with the tagline "The Association of Public-Safety Communications Officials - International" in a smaller font below it.
A circular logo celebrating APCO's 75th anniversary, with "75 YEARS" in the center and "APCO" at the top.
The NPSTC logo, consisting of the stylized graphic and the acronym "NPSTC".

Standard Channel
Nomenclature for the
Public Safety
Interoperability
Channels

APCO/NPSTC
ANS 1.104.1-2010


The ANSI logo, which includes the text "Approved American National Standard" and the acronym "ANSI" in a bold, italicized font.

www.apcointl.org

Interoperability Committee



- Working Group Update – John Lenihan
 - Radio Interoperability (IO) Best Practices
 - Mark Schroeder, Chair
 - Working on 13 best practice statements



National Public Safety Telecommunications Council

NPSTC **Radio Interoperability Best Practices**

Best Practice #10
Training and Proficiency in the Management and Usage of I/O Systems

Best Practice Statement

Radio Interoperability systems shall only be used and managed by those who are trained and have demonstrated proficiency with the appropriate technical, operational and procedural aspects of the system. This best practice applies to first responders, technicians, dispatchers and includes both operability and interoperability issues.

Statement of Importance

Personnel with insufficient training have incorrectly activated radio patches, misprogrammed first responder radios, and failed to identify readily available I/O solutions which have all led to major communications failures. Successful management of mission critical communications interoperability requires time sensitive action by personnel with very little margin for error. Personnel with responsibility for interoperability components include the radio and IT technicians (who design, implement and maintain the solution), users of the I/O system (including communications center dispatchers/telecommunicator, emergency responders, incident commanders and ICS Communications Unit personnel), their supervisors (in their role as instructors, mentors, schedulers, and evaluators), and executive level management staff (who provide overall responsibility for policy and budget). All of these personnel should receive targeted training which is appropriate for their specific function of the interoperability system. The training provided must result in demonstrated proficiency to the level documented by agency policy. Training programs should include a basic understanding of portable and mobile radio features including how to change groups, expectations of performance coverage for each channel (especially as it relates to tactical, simplex, or interoperability channels), and troubleshooting. Additionally, communications center personnel need information on interoperable channel assets, coverage, and options during major or multi-jurisdictional incidents or system failures.

VERSION 2/23/2016

Radio IO Best Practices *continued*



- Example: Training and Proficiency

Best Practice Statement

Radio Interoperability systems shall only be used and managed by those who are trained and have demonstrated proficiency with the appropriate technical, operational and procedural aspects of the system. This best practice applies to first responders, technicians, dispatchers and includes both operability and interoperability issues.

Radio IO Best Practices *continued*



- Radio IO Best Practices Statements
 - BP A: Nationwide I/O Channel Naming and Usage
 - BP B: Radio Channel Assignment and Use within High Risk Incident Environments
 - BP C: Nationwide documentation of Interoperability Channels
 - BP D: Change Management for Interoperability Systems
 - BP E: Time Phased Deployment of Interoperability Resources
 - BP F: Infrastructure Management
 - BP G: Radio Device Management
 - BP H: Channel Assignment Based on Infrastructure Coverage
 - BP I: Communications Span of Control
 - BP J: Training and Proficiency in the Management and Usage of I/O Systems
 - BP K: After Action Reviews
 - BP L: Interoperability Relationships
 - BP M: Managing Encryption during Interoperable Events



Interoperability Committee

- Encryption on Interoperability Channels – John Lenihan and Don Root
 - Current NPSTC position is that designated nationwide interoperability channels should not be encrypted.
 - Public safety agencies are evaluating expanded use of encryption:
 - Need to interoperate with federal agencies who are required to communicate using encryption
 - Changing threat landscape in the U.S.
 - Increasing availability of web and phone applications that monitor public safety channels in real time.

Encryption on Interoperability Channels continued



- Current encryption practices:
 - FCC prohibits encryption on 700 MHz calling channels.
 - Use of encryption is controlled in many Statewide Communications Interoperability Plans (SCIP) and by Regional Planning Committees (RPCs)

Encryption on Interoperability Channels continued



- Feedback received from public safety agencies:
 - Encryption should not be used on any designated I/O channels, keeping them available for use by any agency
 - Encryption should not be used on I/O calling channels, but may be used on tactical channels designated for that purpose.
 - Encryption should be allowed on all I/O channels when necessary; as determined at the local or regional level, and when a communications plan is developed (e.g. pre-planned event)

Encryption on Interoperability Channels continued



- NPSTC Governing Board Discussion
 - Feedback from Governing Board members
- NPSTC Governing Board Action
 - Reaffirm current position statement that encryption should not be used on I/O channels.
 - Change current position to recommend that encryption should not be used on I/O calling channels
 - Create new position statement on the broader use of encryption; to include need for technical planning, training, use of best practice documents.
- Any position statement should acknowledge the role of the state plan and/or RPC authority to regulate encryption.



Adjourn | Thank you!

Questions?

support@npstc.org | 1.800.807.4755

The member organizations of the National Public Safety Telecommunications Council are grateful to the Department of Homeland Security's Science and Technology Directorate, Office for Interoperability and Compatibility (OIC) and the National Protection and Programs Directorate, Office of Emergency Communications (OEC) Points of view or opinions expressed are those of the originators and do not necessarily represent the official position or policies of the U.S. Department of Homeland Security.