National Public Safety Telecommunications Council (NPSTC)
Full NPSTC Meeting by Teleconference
January 24, 2017

Welcome and Opening, Ralph Haller, NPSTC Chair. Mr. Haller called the meeting to order at 1:00 p.m. EST. Participants on the phone were asked to send a record of their attendance to attend@npstc.org. A quorum was present. Mr. Haller thanked Ed Marecki, former representative from the National Emergency Number Association (NENA), for his service, and welcomed Eric Parry as the new representative.

Federal Partners Update

Department of Homeland Security (DHS), Office of Emergency Communications (OEC), Dusty Rhoads, Chief, Public Safety and National Security Emergency Preparedness (NSEP) Communications Governance Branch. Mr. Rhoads reported OEC is continuing to improve current LMR radio usage while enhancing the use of broadband and next generation technologies. OEC relies on its public safety partners to provide feedback to allow better understanding of first responders needs. This year OEC will be developing the Nationwide Communications Baseline Assessment (NCBA) to assess the nation's ability to communicate during a response to natural disasters, acts of terrorism, and other man-made disasters. The purpose is to improve understanding of emergency response providers' capabilities in use and needed to establish operable, interoperable, and continuity of communications across all levels of government. Congress directs OEC to conduct this assessment of federal, state, local, tribal, and territorial governments no less than every 5 years, in accordance with the Homeland Security Act of 2002.

OEC is continuing its reorganization to support its core mission. OEC's work occurs in four branches—the Governance Branch with a mission to enhance and support interoperability through its involvement with, among others, the National Council of Statewide Interoperability Coordinators (NCSWIC), SAFECOM, the Emergency Communications Preparedness Center (ECPC), Federal Partnership for Interoperable Communications (FPIC), and NPSTC. The Integrated Branch provides technical assistance to all states and territories. The National Emergency Communications Plan (NECP) and Grant Branch leads strategic planning for OEC and supports all aspects of federal grants policy. The Priority Service Branch covers Wireless Priority Service (WPS) and Government Emergency Telecommunications Service (GETS) and will be transitioning to services through commercial providers. The next SAFECOM meeting will be held on May 2 in San Antonio, TX.

Department of Homeland Security (DHS), Science and Technology Directorate (S&T), Briefing on Incident Management Preparedness and Coordination Toolkit (IMPACT), Nicolas Eiden, Program Analyst. Mr. Eiden discussed the Incident Management Preparedness and Coordination Toolkit (IMPACT) which provides an intuitive interface that is simple to use with task wizards. The tool was developed through the Oakridge National Laboratory with support from S&T. The tool is free to

government users. It provides event monitoring and evacuation simulation; custom map making; con-ops simulation; pre-event planning; real-time data feeds; GPS tracking; facility protection; automated reports; table top and live exercises; works on the desktop, laptop, or tablets with server; is compatible with Windows, Mac, and Linux; and works with/without network connection. For more information on IMPACT, visit http://geo.ornl.gov/impact/.

Technology and Broadband Committee, **Tom Sorley, Committee Chair; Andy Thiessen and Michael Britt, Vice Chairs**

Public Safety Communications Research (PSCR), Dereck Orr, Division Chief. PSCR released a grant program recently through its Public Safety Innovation Accelerator Program to advance research, development, and testing of key broadband technologies useful to public safety agencies. Subject areas include mission critical voice, location based service, analytics, and communications demand modeling. PSCR has developed research and prototyping platforms to develop public safety solutions without having to create an entire LTE network where staff will be able to research direct mode and Pro Se capabilities and resiliency in mission critical voice. The grant program encourages public safety involvement and a public safety person must be part of the grant application. PSCR has seen more interest than it expected in the up to $30 million in funds being awarded. It has hosted several webinars with 150 people attending and hopes to make awards before their June conference to enable presentations at that time, including poster demonstrations. More information is available at www.grants.gov and on the PSCR website.

The June stakeholders meeting will be held on June 12-14 in San Antonio, TX, at the Marriott Riverwalk. The registration site will be forthcoming in the near future. Bruce Cox asked if there was a list of public safety agencies that are partnering in the grant. Mr. Orr said he is aware that some public safety agencies have partnered with organizations on the grant process and that PSCR is about to issue a document to encourage more public safety participation.

Broadband Deployable Systems Working Group, Claudio Lucente, Chair. NPSTC Deputy Executive Director, Barry Luke, reporting for Mr. Lucente, provided an update on the work of this group. They have been meeting for almost 2 years and have a near final, very comprehensive report expected to be complete in February. One issue of significance involves how certain applications and services are managed when a deployable system is used with mission critical push-to-talk (MC PTT) voice. For example, when the PTT application is hosted on the FirstNet core network, what happens when the backhaul link is lost? Users communicating through FirstNet towers or the core network will still be able to talk, but users at the incident scene connected through the deployable via a backhaul connection (e.g., satellite, 4.9 GHz) will lose their MC PTT connection and will have to use a direct mode/ProSe communications path.

In another example of potential management, the MC PTT application is hosted on both the deployable system and the FirstNet Core. 3GPP has an evolving standard for dual-hosted MC PTT servers. First responder radio communications must flow to a primary MC PTT server (either core or deployable). The secondary MC PTT server is a mirror image of the primary. If the backhaul connection is lost in this case, users communicating through FirstNet's core network will maintain their talk group. Users at the incident scene, communicating through the deployable system, will be switched to a talk group. The transition time is unknown as it depends on configuration.

Broadband Emerging Technology Working Group, Kim Coleman Madsen, Chair. Ms. Coleman Madsen reported on the focus of this group, which has included extensive educational presentations on various emerging issues. The United Kingdom provided an update on its implementation of public safety broadband in October. The Duke University, DiVE program (Duke Immersive Virtual Environment) provided an overview of its work on virtual reality and simulation during the November session. PSCR will be providing an update on its projects on January 25. An extended 90-minute panel discussion on Small Cell Technology is being organized for the February session. The Working Group has completed the FirstNet Web Status Page Report, which was approved by the Governing Board in December 2016 and transmitted to the FirstNet Public Safety Advisory Committee (PSAC).

LMR LTE Integration and Interoperability Working Group, Chris Kindelspire, Chair. Mr. Luke, reporting for Mr. Kindelspire, said the Working Group is continuing the development of use cases to study how LMR and FirstNet may integrate. The group is examining various technical and operational issues surrounding the use of encryption by interconnected first responders who are using both LMR and LTE, which includes these options:

- Transcoding Option: LMR uses P25 encryption while LTE uses a different encryption. Encrypted messages are "decoded" and "recoded" at the point of the connection, allowing both networks to maintain their own encryption keys.
- End-to-End Encryption: LMR and LTE share the same encryption scheme and there is no break in the security of the message from one first responder's device to another.

Future discussions will involve a review of Regrouping and Rekeying for LMR and LTE. The Working Group expects to have a report completed in March.

3rd Generation Partnership Project (3GPP) Standards Update, Andy Thiessen. Release 14 is currently being closed out. Work included addressing gaps in Mission Critical Push to Talk (MC PTT) that were not resolved in Release 13. Release 14 will close as many of the high priority gaps as possible within the time remaining. Release 14 is also addressing other issues, including Mission Critical video and Mission Critical data; the need for a common core framework to standardize elements of voice, video, and data; and work on IoT/Wearables. The IoT work will repurpose some of the direct mode work done in earlier releases to assist manufacturers. This will let data from a wearable sensor or device jump from the user's smart watch to a LTE phone device and on to the commercial cellular network. It would use a small LTE radio in the watch to communicate to the cell phone. This concept was approved in Release 14. It was also recognized that a group communications capability may be needed to share video and data. This might involve the re-use of MC PTT voice standards work.

One gap that was not addressed in Release 14 was continued work on the LMR to LTE interconnect. This is being managed in working group SA6 and will roll to Release 15. 3GPP is handling 5G technology standards in Release 15 and Release 16. There are many new suggestions for features and capabilities in the 5G standards. The question is what to include in the first release (R15) and what to hold for the second/final release (R16). Commercial operators want Release 15 to be less fully featured, so it can get

to market more quickly. There is a concern that the lack of approved standards will cause some operators and vendors to implement proprietary solutions.

For public safety, multicast and broadcast capabilities will now slip to Release 16 since they are first responder centric. Dynamic policy control is another focus area for Release 16. FirstNet is focused on creation of a standard for dynamic priority control. Priority and quality of service can be managed today but requires middleware/translation software. A standardized way to do this will make it safer. Stage 2 work on this project is underway in the 3GPP Radio Access Network (RAN) and System Admin groups.

The December plenary meeting held in Vienna, Austria, focused on approving a number of change requests to further tighten the mission critical services. The March plenary meeting will be held in Dubrovnik to review and approve the work done thus far. 5G Stage 1 work on Dynamic Policy Control will be sent to the plenary for information before final approval in June.

Internet of Things (IoT) Working Group Status Update, Tom Sorley. Previously, the Governing Board authorized the creation of a new Working Group to study IoT. Preliminary work has been accomplished in the Broadband Emerging Technologies Working Group, but IoT is a very large area of study that includes the need to examine the broad range of IoT issues and then to focus on a small number of projects that are manageable. Initially Working Group members would research current activity and then identify recommended projects. The National Institute of Standards and Technology (NIST), PSCR, Smart Cities, and DHS's S&T are all heavily engaged in this area and will be invited to discuss their projects. The goal is not to duplicate any existing work.

Barry Fraser, General Manager of BAY-RICs, has volunteered to lead this Working Group. Vice Chair(s) will be selected, as needed, once the group is organized. The proposed Working Group charter was previously distributed to the Governing Board. Motion and Vote**:** Tom Roche, International Association of Chiefs of Police (IACP), moved to approve Mr. Fraser as Chair of the IoT Working Group. Paul Fitzgerald, National Sheriffs' Association (NSA), seconded the motion. Approved.

UAS and Robotics Working Group, Michael Britt, Chair. Dr. Britt reported the Working Group is nearing completion of its first report, *Public Safety Guidelines for UAS Programs.* They have been reviewing an extensive collection of reports coming from other agencies and entities, including *Community Policing and Unmanned Aircraft Systems,* DOJ COPS, and *Five Things to Know About Small Unmanned Aircraft Systems*, Police Foundation. The Working Group is preparing for an IWCE panel on UAS and Robotics. They will examine UAS as an aerial communications platform, leveraging information from the Broadband Deployable Systems final report. Initial efforts will focus on general UAS requirements from a public safety mission perspective – flight time requirements, sensors required, telecommunications equipment capabilities, and power required.

Video Technology Advisory Group, John Contestabile, Chair. Mr. Contestabile said the VTAG has participated with Underwriters Laboratory (UL) on a survey to capture requirements for tactical video cameras. The VTAG also participated in a review of the final report created by the NIST Video Analytics in Public Safety (VAPS) program office and assisted with the review of the *Video Quality in Public Safety (VQiPS) Video Handbook, Volume 2.*

DHS supports the Video Quality in Public Safety (VQiPS), which published "Policy Considerations for the use of Video in Public Safety" on June 24, 2016. The cover article published in the *Mission Critical Communications*, October issue was based on this report. The VQiPS Annual Meeting was held in August in Seattle, WA. The VQiPS program presentation was also given at the Secured Cities conference in November in Houston, TX. Membership rotation of the VQiPS will occur in spring 2017 as well as a formalization of VQiPS guidance documents.

Radio PCR Working Group Update, Dan Robinson. Mr. Robinson reported on current work on the PAM Tool. The Working Group held a face-to-face meeting in Houston, TX, in September, where the group recommended the addition of Channel Names and a full NIFOG channels list to each vendor tab to make use of the PAM tool easier. The Working Group is in the process of delivering the PAM tool to DHS for future operation and maintenance, to be posted on a new Internet site, either on DHS Public Safety Tools or a similar site.

The group has developed a request for a Technical Bulletin to be submitted to the Telecommunications Industry Association (TIA), asking to make mandatory PAM fields into common interchange format. The presentation will include a visual aid that describes the Pre-PAM tool, the PAM tool now, and its future state. Working Group representatives will attend the January TIA meeting armed with support letters to promote the Technical Bulletin request. Motion and Vote: Charlie Sasser, Vice Chair, Spectrum Management Committee, moved to approve a letter of NPSTC support, asking TIA to create a Technical Bulletin on the radio programming common interchange format. Sheriff Fitzgerald seconded. Approved.

Interoperability Committee Discussion, John Lenihan, Interoperability Committee Chair; Jason Matthews, Vice Chair
Emergency Medical Services, Paul Patrick, Chair. Mr. Patrick reported the Working Group finalized "10 Reasons EMS Should Be Engaged with FirstNet" that was approved by the Governing Board in October 2016, which was distributed broadly, including at the EMS World Conference. Recently, the Working Group learned about Mobile Personal Emergency Response Systems (mPERS), which uses GPS incorporated with cellular network services that allows users to travel anywhere and press the help button. There may be a follow-up mPERS presentation in March. February's meeting will focus on rural EMS and the role of FirstNet. Future topics include plans to review and refresh the list of EMS-centric public safety broadband applications.

Cross Border Working Group, Steve Mallory, Chair. Mr. Mallory said the Working Group has been working with OEC to encourage states to adopt best practices and recommendations coming from the completion of the Border Interoperability Demonstration (BIDP) grants. The State of Washington is examining options for improved coordination with Canada. North Dakota has filed for a waiver of FCC rules to implement the Montana cross border solution using VLAW31. The Working Group is also finalizing a report on cross border data sharing involving access to cellular company network and account data. It is monitoring the work of the Broadband Deployable Systems Working Group, regarding how users of FirstNet may interact with Canadian first responders and working with the FCC to host another webinar on cross border base station licensing.

Encryption on Interoperability Channels, Jason Matthews. Mr. Matthews reviewed the current recommendations of the Encryption Task Force. A poll was distributed to public safety agencies in May 2016 to assess how and if public safety agencies use encryption. The Task Force also reviewed the recent FCC decision regarding analog and digital operations on designated nationwide interoperability channels and has finalized an outreach document to educate public safety agencies on this issue and developed the following findings:

- Encryption is not allowed on nationwide interoperability calling channels and tactical channels in VHF, UHF, and 800 MHz.
- Encryption is not allowed on 700 MHz calling channels but is allowed on 700 MHz tactical channels.
- Some frequencies are allocated as Mutual Aid channels (e.g., VLAW and VFIRE), and encryption is allowed.
- Encryption is allowed on local, regional, and statewide interoperability channels (if allowed by the local authority).

Discussion: John Powell suggested these findings need to be distributed to those who are actually using encryption operationally such as tactical officers, gang task groups, and highway patrol, not just the chiefs and communications personnel. Motion and Vote: Anton Damm, National Association of State Foresters (NASF), moved that the Governing Board approve the *Encryption on Interoperability Channels* report. Lloyd Mitchell, Forestry Conversation Communications Association (FCCA), seconded. Approved.

Common Channel Naming ANSI Standards Update, Don Root. Mr. Root announced the revised Association of Public-Safety Communications Officials (APCO) International—NPSTC ANSI standard on common channel nomenclature has been approved. This revision will be a 2017 American National Standards Institute (ANSI) standard. The 2016 National Interoperability Field Operations Guide (NIFOG) Manual is now in sync with the ANSI standard. The Governing Board previously voted to submit this to APCO, which manages the ANSI standards approval process.

Radio Interoperability Best Practices, Mark Schroeder, Chair. Mr. Schroeder reported the following reports have been completed and were provided to the Governing Board prior to the meeting. The Best Practices Master Report is an overview of the Best Practices project and is a companion document to any individual best practice report. Also complete are: Best Practice 1: Channel Naming; Best Practice 2: Change Management; and Best Practice 3: Training. Additional best practice reports are in the pipeline. The group continues to review after action reports and work on new best practice documents. Motion and Vote: Doug Aiken, NPSTC Vice Chair, moved the Governing Board approve the Radio Interoperability Best Practices Master Report and Best Practice documents 1, 2, and 3. Mr. Mitchell seconded. Approved.

Spectrum Management Committee, Don Root, Chair; Charlie Sasser, Vice Chair
2016 Accomplishments, Don Root. Mr. Root reviewed recent FCC decisions.
- Opened public safety interoperability channels to Railroad Police.
- Set analog FM as mode for interoperability channels at VHF, UHF, and 800 MHz bands.
- Set P25 CAP compliance as requirement to market or sell equipment (testing details under discussion).

- Clarified emission mask on 800 MHz NPSPAC channels to minimize adjacent channel interference.
- With FirstNet, decided process, funding, and deadline for 700 MHz narrowband incumbents to vacate 700 MHz broadband spectrum.

NPSTC documents in 2016 include the T-Band Update Report, published May 2016, and the 700 MHz Reliability and Interoperability Position Paper, published in October 2016.

Anticipated Issues for 2017
- 4.9 GHz—Expect comprehensive FCC NPRM. Anticipate extensive work to address issues. The band may include multiple tiers/prioritization and a shift from jurisdictional to site-based licensing. Frequency coordination: traditional and dynamic. Band plan adjustments and technical requirements. Grandfathering of existing systems.
- T-Band—will serve as SME to support NPSTC members.
- Follow-up on P25 CAP, GPS protection, and 5.9 GHz.
- Assist UAS Working Group on spectrum.
- Other issues as they arise, e.g., cybersecurity NOI.

The FCC issued a Notice of Inquiry (NOI) on Cybersecurity for 5G on December 16, 2016. Comments are due 90 days after Federal Register publication. Paragraphs 43 and 44 are specific to public safety usage (e.g., sensors, IOT) for 5G, including security implications of linking/integrating 5G networks and public safety systems; Identity, Credential and Access Management (ICAM) issues; and the need for standards development regarding any public safety 5G technologies and services. Motion and Vote: Kevin McGinnis, National Association of State Emergency Medical Services Officials (NASEMSO), moved that the Governing Board approve a Task Force to assist the Committee with the NOI. Mr. Sasser has volunteered to chair the Task Force. Mr. Damm seconded. Approved.

FirstNet NPSBN Development
FirstNet, Kevin McGinnis, FirstNet Public Safety Board Member. Mr. McGinnis said since the last meeting, FirstNet has launched its Innovation and Test Lab in Boulder, CO. This will be a plug and play platform for FirstNet and its future partner to test various parts of the network, including QoS, priority and preemption, and other features of the network. Public safety users will be able to come onto this network as well. FirstNet will add a training experience center for users to plug and play apps. FirstNet is involved in active procurement now.

Governing Board's Appointed Delegates
FCC Task Force on Optimal PSAP Architecture, Bob Brown, IT Manager, State of New Hampshire. The FCC Task Force on Optimal PSAP Architecture is a 2-year task force organized by the FCC that completed its work this year. The goal was to examine the optimal PSAP system and network configurations in terms of emergency communications efficiency, performance, and operations functionality. The emphasis in the original charter was to report on consolidation options for the 6,800 PSAPs nationwide. Membership included: Robert Brown, State of New Hampshire (NPSTC), Jay English, APCO, and Brian Fontes, NENA. Three Working Groups were formed: WG #1: Cyber Security: WG #2: NG911 Architecture; and WG #3: Governance and Funding. Reports were released in 2015 and 2016.

From the 2015 Final Report Summary, WG #1 emphasized education on cyber issues and staffing models, leveraging existing work. WG #2 emphasized "one size does not fit all" and that consolidation decisions are complex. The focus was on planning and transition from legacy to NG911. WG #3 identified the need for a sustainable funding model and noted diversion of 911 funds by states and problems with funding two systems during a transition to NG.

The results of the 2016 Final Report Summary by Working Groups found:
- WG #1: Further refined the EC3 concept (Emergency Communications Cybersecurity Center), provided cost projections, and reviewed Information Sharing Environments (ISE) for cyber coordination.
- WG #2: Leveraged the NG911 Implementation Maturity Model, created by the National 911 Program Office. Created an NG scorecard, allowing self-assessment of an agency's readiness. Reviewed early adopter case studies for NG911 ESInet implementation.
- WG #3: Identified common costs for NG911 and further defined specific examples and various models. Identified other potential revenue sources.

The Task Force has completed its work. The FCC has recommended that Congress provide necessary legislation to support a nationwide transition.

Alarm Industry Communications Committee (AICC), Doug Aiken, NPSTC Vice Chair. The AICC is a committee composed of representatives of the Central Station Alarm Association (CSAA) International, the Electronic Security Association (ESA), the Security Industry Association (SIA), and major alarm companies and manufacturers. CSAA is a recognized FCC frequency coordinator for Industrial/Business channels below 800 MHz under Section 90.35 of the Commission's Rules. AICC:

- Provides coordination in a variety of areas between the alarm industry and the FCC, other regulatory agencies, and members of Congress, when needed.
- Monitors developments at the federal level affecting the ability of the alarm industry to use telecommunications technology in providing protection services to the public.
- Retains an attorney in Washington, D.C., to represent the industry on wireline and wireless issues and to file briefs with the federal courts on behalf of the industry.
- Retains a lobbyist who works with members of Congress to attain legislation favorable to the alarm industry.

Current issues include: Communications network alternatives as copper networks are retired; wireless networks technologies; sharing of central station 450 MHz LMR channels; FirstNet opportunities; securing the Internet of Things; and legislative issues. The next quarterly meeting will be held March 9, 2017, in Washington, D.C. The AICC Chair is Louis T. Fiore. Chief Aiken is the NPSTC Representative to AICC.

Liaison Update
University of Melbourne Centre for Disaster Management and Public Safety (CDMPS), Ralph Haller Reporting. During a trip to Australia, Mr. Haller had the opportunity to visit the CDMPS at the University of Melbourne and to brief attendees on the formation, role, and organization of NPSTC. The group would like to develop a similar entity, but Australia does not have the same type of associations the U.S.

does and would have to create an organization incorporating users instead. CDMPS has requested that some portion of NPSTC meetings could be held to allow them to attend from their time zone.

Old Business
Strategic Plan Discussion, Scott Bryant, Scott Bryant and Associates. The participant questionnaire sent to 3,000 participants was completed by over 400 participants. A large majority (98%) were very satisfied or satisfied with NPSTC overall. Most participants rated NPSTC services as excellent or good. A large majority (95%) would recommend participation in NPSTC to others. A similarly large majority (95%) thinks NPSTC has been effective in addressing and resolving issues facing public safety communications, and most (90%) think NPSTC has the right composition of member organizations to be effective.

Mr. Bryant also completed interviews with 32 Governing Board members, alternates, and support staff with perspectives collected regarding key accomplishments over the past 5 years, current strengths, and key challenges. Participants were also asked about future focuses, primary challenges or barriers, and most effective strategies/key strategic initiatives. Mr. Bryant said he is developing a summary of perspectives, key strengths and challenges, and future focus areas. Task Force Chair, Mr. Mitchell, said he believed the results show NPSTC is both moving forward and accomplishing a lot.

New Business
Marilyn Ward, NPSTC Executive Director, said NPSTC will meet again in person at the IWCE Meeting on Friday, March 31, 2017, and in Washington, D.C., on Wednesday, September 6, 2017. NPSTC will celebrate its 20th anniversary this year, and Ms. Ward asked members to send her the names of early NPSTC participants. Mr. Haller encouraged attendees to book hotel rooms early as there are several other large meetings occurring in the same time period.

Adjournment. Chief Aiken moved to adjourn the meeting; Mr. Mitchell seconded. Mr. Haller adjourned the meeting at 3:19 p.m. EST.