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National Public Safety Telecommunications Council

The Collective Voice of Public Safety Communications

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8191 Southpark Lane, Unit 205
Littleton, CO 80120-4641
PH: 303-649-1843
FAX: 303-649-1844
Toll free: 1-866-807-4755
www.NPSTC.org
NPSTC@highlands-group.com

National Public Safety Telecommunications Council
Public Input Meeting
February 5, 2007
Orlando, Florida

Introduction, John Powell, Chair, Interoperability Committee

John Powell, Chair, Interoperability Committee, welcomed the participants to NPSTC's Common Nomenclature Working Group's Public Input Meeting.

NCC Review and Common Nomenclature Recommendation, Ralph Haller, Forestry Conservation Communications Association (FCCA), Moderator; Meeting Panel: Ron Mayworm, Chair, Common Nomenclature Working Group; Don Root, Chair, State Interoperability Executive Committee (SIEC) Working Group; Carlton Wells, State of Florida

Ralph Haller, FCCA, thanked the participants for attending this important meeting to promote interoperability, noting the presence of the many experts represented in the room and on the telephone. Over 50 public safety professionals participated in person, with seven individuals calling in to the forum. NPSTC's goal is to promote interoperability for public safety, Mr. Haller said. A key minimal element of interoperability is at the least the ability to tune radios to the same channels. How do we assure that people *know* they have the capability to talk to each other without a common nomenclature? Hurricane Katrina pointed out very graphically that when public safety does not know where the interoperability channel is on a radio or what it is called, lives and property are put at needless risk.

NPSTC has proposed adoption of a common naming scheme for the interoperability channels based on the Federal Communications Commission (FCC) Public Safety National Coordination Committee (NCC's) common nomenclature plan. Mr. Haller suggested that the group might develop consensus on some variant of that plan at this meeting. He suggested that questions to consider are the extent to which jurisdictions have invested money in equipment that does not meet the NCC nomenclature; equipment limitations such as radios with no or limited character display; and whether there should there be a mandatory date for implementation and, if so, when, suggesting the 2013 mandatory narrowbanding date below 512 as a possibility.

Background

To provide some context to the discussion of common nomenclature, Mr. Powell and Mr. Wells briefly reviewed the history of the nomenclature issue, outlining some of the past documentation and recommendations of the NCC on this issue. Mr. Powell noted that the issue of channel naming comes up again and again in incident management After Action reports because of reported problems that the channel names didn't match and first responders assumed they could not talk to one another. The first document submitted to the FCC on standardized naming was submitted on June 2, 2000, by Carlton Wells, chair of that NCC Working Group for 3 years, whose tenure was followed by Steve Devine, State of Missouri. On May 29, 2003, NCC Chair Kathy Wallman submitted a final letter from the

NCC to then FCC Chair Michael Powell, highlighting three recommendations of the NCC:

1. Standard channel identification nomenclature for all interoperability channels in all bands designated for public safety.
2. Assignment of an additional VHF low band frequency pair for interoperability use by the fire service.
3. Minimum signal levels for public safety systems in urban and rural environments.

Mr. Wells reported that, as the NCC began, he suggested a working group focused on a standard naming convention for the 700 MHz interoperability channels. Recognizing what had been done in the 800 MHz band for the tactical and calling channels, the group developed a table that broke the 700 frequencies into 7CallA and 7CallB. It was initially designated by LTAC for law enforcement tactical channels, FTAC for fire, DTAC for data, etc. The table was submitted to the NCC and on to the FCC. In its Third Report and Order, the FCC identified these channel names while not mandating adoption. The second document of this working group added two-digit identifiers so there was space allocated in the naming conventions for two digit numbers and, consequently, 7GTAC became 7GTAC55. The eighth character was reserved for D, designating direct, for those radios that did not have a switch to go to direct to identify talk around or direct mode between radios not using a repeater. The eight character name was based on the radio displays being built by the manufacturers. The proposed NCC scheme skipped every other channel to leave room for growth for local or regional or what could be additional mutual aid channels.

Mr. Powell added that when the recommendation went to the FCC, there was a complete rewrite on interoperability that included all the bands, not only 700, together in one succinct set of rules, primarily addressing the service-specific channels. Mr. Devine added that the NCC recommendations were to operate under the premise that other conditions would be met such as the SIECs operating in the states, and the standardization of some of the interoperability footnotes. When the working group developed the list, it was understood that it would be easier to get consensus on a 700 list because that band wasn't being used at that time. The working group hoped this would lead us to some consistency nationwide although it was understood that it would take time.

Mr. Devine asked for some clarification of the goals of this public forum, asking if the goal was to develop best practices or recommendations to the FCC. Mr. Root replied that in light of all ongoing events since the FCC declined to adopt the NCC recommendations, this forum should develop recommendations to the FCC. Mr. Mayworm said that it would be very likely that NPSTC would develop best practices if consensus cannot be developed. In surveying the community, the Regional Planning Committees (RPC) Committee has found that RPCs say that the NCC scheme in 700 is acceptable, that in 800 MHz, many prefer ICALL and ITAC, and that in the lower bands there is resistance to the NCC scheme.

Mr. Powell said that there are opportunities to inject common naming as a requirement, such as in grant guidance. The Department of Commerce has made $1 billion available for state and local equipment, designating $100 million for nationally deployable systems. Mr. Mayworm added that the legislation also says that for the remaining $900 million of that grant, applicants must certify that voluntary standards have been adopted regarding interoperability.

Mr. Haller said that the issues the forum needs to address today are the channels that are potentially national and programmed into every radio. It is important to come to consensus on those national channels, allowing fluctuations for regional plans.

Bob Pletcher, State of Texas, said that the State of Texas has been asking serious questions as to why we don't have an interoperability naming plan after situations like Katrina. These national channel names have to be easily spoken and understood and they must be as simple as possible. Time is of the essence,

he said, adding that the delegation from Texas is going ask the Department of Homeland Security (DHS) to mandate naming. Sean O'Hara, State of New York, said it is important that a response be organized at the state level, such as with the SIECs, to pull together information and to involve stakeholders as common nomenclature is implemented. Mr. Powell noted that DHS requires all states to complete their communications plan by the end of the year. This requirement could provide an opportunity for the states to provide documentation of their current naming schemes. Patty Broderick, Orange County (Florida) Sheriff, said that naming needs to be simple to the user, but one of the most important elements is educating and developing a written plan for state trainers that is consistent for each state.

Mr. Haller asked the group to consider common nomenclature across different bands and how important it is that the nomenclature be consistent across the bands. Glen Nash, Chair, Technology Committee, said he would caution against repeating the channel number in each band because there is a danger of confusion with repeated numbers. Unless you establish a rule that says if you cross tie those bands together through a gateway that says VTAC10 can only be connected to UTAC10 or ATAC10, there's a danger that a user will go to the wrong version of the channel and be unable to communicate. Mr. Powell said that in Denver all gateway systems are color coded in addition to the normal names to avoid that issue. Mr. Nash said that is a valuable tool for local use, but noted that hundreds of gateways are going out. From a user's standpoint, it is imperative to avoid confusion and make the channel number unique.

John Penido, California Fire Chiefs, said that the state of California already uses every color name in their channel plan as does Orange County, Los Angeles Sheriffs Department, and others. He is concerned that a national plan that uses colors would require state and local agencies to rename their daily plans. He recommended that public safety adopt best practices, and a sound, usable, easy-to-train plan that has been well vetted and publicized. He also cautioned that tying common nomenclature grants from the top down through a mandated system will cause problems on the local level. There should be a national standard but how that standard is promulgated will be a long process that will take patience and needs to focus on the local user who manages the local emergency. Chief Penido said that if public safety encourages Congress to set aside money for the purpose of migrating to common nomenclature, it would be an incentive for agencies to adopt it. Mr. Powell suggested that future grant guidance include grant language to say it is permissible to reprogram radios with grant dollars.

Mr. Root noted that in California in an earthquake or wildfire, frequencies are assigned to the incident. Within the incident, users will get assigned to a channel from a pool of frequencies assigned to the incident. Chief Penido agreed that public safety needs to look carefully at how the most common interoperability incidents occur and how they grow. He also noted that big incidents have a Communications Unit Leader who should have a well-developed communications plan. Firefighters bring their radios to the Communications Unit and they program the radios to the incident.

Regarding educating the user, David Warner, Commonwealth of Virginia, reported that Virginia disseminates information on interoperability issues. While the Commonwealth cannot force adoption of issues on a local level, it tries to encourage the adoption of certain standards, accomplished through seminars throughout the year.

Mr. Devine recommended that public safety should identify and document what nomenclature is in use today. Mr. Root suggested that NPSTC could acquire the baseline information on nomenclature suggested by Mr. Devine at the March National Governors Association (NGA)/SAFECOM/NPSTC Statewide Planning conference by asking for an overview of what states are doing in a general sense.

Public Comment

To review the specific plans, recommended channel names, associated recommendations, and comments, go to http://www.npstc.org/channelNaming.jsp.

California: Tim McClelland, Assistant Fire Chief, CAL FIRE (formerly California Division of Forestry and Fire Protection), Chair, FIRESCOPE Communications Specialist Group; Fire Chief Randy Bradley, Lawrence Livermore Lab Fire, California Fire Chiefs and California SIEC; Glen Savage, CAL FIRE Telecommunications Manager, FIRESCOPE, and California SIEC; Chet Ashbaugh, Riverside County Fire Telecommunications Manager, FIRESCOPE; Brent Finster, Contra Costa County Fire Telecommunications Manager, FIRESCOPE and California SIEC; and John Penido, Fire Chief, San Marino Fire, California Fire Chiefs Association and California SIEC

Assistant Fire Chief McClelland introduced the representatives of the California fire community and said they were compelled to attend this meeting because it is such an important issue. He noted that California is responsible for 66 percent of the activity processed in the Resource Ordering and Status System (ROSS), used to exchange resources across multijurisdictional lines, and uses the interoperability channel consistently and often because of the tight integration of federal, state, and local government agencies in California.

In 1991, the state of California mandated that all public employees be trained to the same standard, the Standardized Emergency Management System (SEMS), modeled on the Incident Command System (ICS). A central element of SEMS is common terminology. The recommendations of the California fire community on naming radio interoperability channels are based on simple, practical, and user-friendly channel names, he said. The California Fire Service Proposal to use the existing, established naming convention such as ICALL, UCALL, VCALL, etc., is based on tried and true usage in a mutual aid environment. The California Fire Chiefs also noted limitations in attempting to adopt the current NCC nomenclature that they feel their proposal addresses.

- The two sets of numbers in the channel label can cause confusion and potential safety issues.
- It is not expandable if additional channels become available for interoperability in t he future.
- The use of FIR and CAL might lead to confusion.
- The existing nomenclature does not meet an eight-character display limitation.
- The federal interoperability channels are mandated by NTIA to use certain channel labels but the NCC standard does not acknowledge the existing mandate which could prohibit interoperability between federal and state/local counterparts.
- The existing NCC nomenclature did not receive adequate discussion in the public safety community prior to adoption.

The California representatives reiterated the commitment of the California fire service to the development and promulgation of a common standard for interoperability channel names, applauding the foresight of the NCC and NPSTC as pioneers seeking to bridge the communications gap between public safety agencies.

Missouri: Steve Devine

Mr. Devine said he appreciates the thorough work that California has done. Missouri has no requirements for the federal law enforcement and incident response channels or recommendations for the low band channels. The Missouri SIEC has developed a Memorandum of Understanding (MOU) for the

coordinated use of VTAC and UTAC with which almost 500 agencies in the state have complied. Some agencies are using UCALL A for talk around and some are using D for direct. Any blank spaces in Missouri's plan imply concurrence with the NCC plan.

National Capital Region (NCR): Jim Sobecke

Mr. Sobecke said that what NPSTC has proposed is very simple and clear and congratulated this effort. He suggested a small change, noting that changing the prefix of the federal channels, beginning the name with the F, would allow the user to immediately identify a federal user. Similarly he suggested that the prefix in the 700 MHz band, 7W, could be changed to W7, providing immediate recognition that the name refers to a wideband channel, and adding an M to identify military channels such as the National Guard. He also said that expanding the two digit channel sequential numbering to three in NPSTC's plan is well conceived.

Tennessee: John Johnson

Mr. Johnson said that Tennessee held many discussions on adopting the NCC recommendations. Questions considered included considerations about whether or not the radio has a display, if it is only two to three digits, or not alphanumeric, and in the future, whether there should be a minimal standard for an interoperable radio, such as a radio that has an eight-character alphanumeric display, 32 channels, is narrowband and P25 compliant, and uses common CTCSS/DCS tones. The standard plan will have to be expandable to include local, regional, and statewide channels. Mr. Johnson said somewhere there needs to be a database repository of channel names for mutual aid events.

Texas: Robert Pletcher

Texas comprises 254 counties, 24 regional councils of governments, each one with the authority to set policy and receive federal funds, Mr. Pletcher said. The Texas Interoperability Channel Plan requires compliance with its channel plan to receive Homeland Security funds and a signed MOU. Currently there are 2,500 signed MOUs. Texas does not want an unfunded mandate coming from Congress. It would cost $7 million to reprogram radios in Texas, not counting 50,000 officer hours. Mr. Pletcher said that while the NCC plan is a well-conceived document, it may not reflect the marketplace or the state of the industry currently. Texas is slowly moving from analog to digital, and, as public safety is in this transition phase, there is the need to differentiate between the two modes. The National Telecommunications and Information Administration (NTIA) is digital by mandate which further hastens the transition.

Wisconsin: Carl Guse

Mr. Guse said he made his recommendations simple to create the least amount of change to what has been offered by the FCC and other organizations. He said that staying with the ICALL, VTAC, etc. names would provide the best chance of compliance, and strongly echoed Mr. Johnson's comments about the need for designated CTCSS/DCS tones.

3:00 pm – 4:00 pm
Consensus Decision and DRAFT Agreement, Ron Mayworm and Don Root

- Charlie Hoffman, NTIA, was asked to provide the federal perspective, but said it would be more appropriate for the federal users group to discuss how they would feel about commonality. He personally feels it is wise for the federal channels to adopt a common nomenclature and this is an appropriate time to accomplish the task. He will share any recommendations from this meeting with

the federal users group for further discussion. Mr. Powell, who is working with the 25 Cities project, many of which involve gateways, says the recommendation has been to use NCC channel names for federal channels.

- Mr. Root asked the California delegation why the channel name in 700 MHz was changed from the prefix 7 to X. California wanted an alphanumeric that would designate band as 700 to avoid confusion by using a number. Mr. Johnson said the letter X is difficult for him to say. [The letter I was adopted for 800 and stands for International.]

- Mr. Pletcher noted that fire is representing California and asked how much interaction occurred with law enforcement and others. Mr. McClelland said this group strictly represents the fire side of the house. Mr. Powell said as chair of the California SIEC, law enforcement is ready to adopt the NCC plan.

- Mr. Root asked Mr. Sobecke for clarification of his discussion regarding the military designations, saying that the .military does not provide a front line public safety role although he understands it may be a little different in the NCR, and noting that the military operates on its own spectrum. Mr. Sobecke said he'd raised the issue in response to a question raised by a National Guard representative. Doug Aiken, Vice Chair, NPSTC, said each state is receiving a minimum of one communications package for the National Guard to assist local authorities and to provide reach back for infrastructure and that they will be equipped by October 2007. Mr. Root said that the National Guard needs a state or local host to use Part 90 frequencies and suggested that NPSTC discuss the issue with the SAFECOM program Mr. Aiken said he had discussed this issue with a representative of the Guard and that they would like to attend a NPSTC meeting.

- Mr. Root asked Mr. Johnson about the marine channels in Tennessee, noting that it's very difficult to put a marine frequency in a Part 90 radio because of type acceptance issues and certification issues. Marine channels are the ones set aside for public safety under 90 20 G.

Following a discussion of the numbering, number of characters, alphanumeric identifiers, and name suggestions for the standard channel naming, the group developed consensus on a basic scheme. The discussion began with a debate of the merits of using a single number for a channel, 1-99, versus reusing those numbers in the different frequency bands.

Mr. Finster noted that if the sequential NCC numbering sequence is used, the way the numbers have been assigned sequentially from the lowest frequency up might cause confusion; for example, nationwide 154.280 is a mutual aid fire channel used in every state consistently. If you use the NCC sequential 1FIR9 as the channel label and 1FIR7, the frequency 15 kHz lower, by just looking at channel label, there's no indication of use. There should be a way to indicate that that particular channel is the first one or the main one. Mr. Root asked if a compromise that used sequential numbering but started the numbering to accommodate Mr. Finster's concern would be acceptable. Mr. Devine agreed that the identity and characteristics and historic use of the channel are important to incorporate into the nomenclature. Mr. Powell suggested that the calling channel could be given the lowest number and would always be the main channel.

In discussion of aligning frequency by service, Mr. Nash noted that there is a need to recognize that different events become very large rapidly causing a need to respond beyond initial response channels. If a channel is named LAW, it no longer becomes a mutual aid channel because a fire responder thinks the channel is not for their use. Mr. Nash suggested that instead the names should be TAC first response channels.

In discussion, the issue of the .number of characters available on a display and the way a name is pronounced on the air was debated. There was a suggestion to begin with an alpha designation for the first three or four characters, followed by three numeric characters [including structure or region names], the eighth position would indicates D for Digital or T for Talkaround. There was discussion about removing the federal channels from the scheme. Also noted from a number of forum participants is the importance of training and the role of the communications unit leader.

In discussion, the issue of the use of a common Continuous Tone Controlled Squelch System (CTCSS) tone or P-25 Network Access Code (NAC) was debated. The original NCC recommendation was that the FCC required (for the five 800 MHz interoperability channels) CTCSS tone of 156.7 Hz be used for all interoperability channels. There was general agreement that transmitters on the Interoperability channels use 156.7 Hz, and that receivers be configured for Carrier Squelch, with the recognition that receivers may need to use 156.7 Hz tone protection to minimize interference from intermodulation products or adjacent channel signals. With regards to NACs, it was noted by a number of the participants that initially the NCC Interoperability Committee recommended the NAC equivalent of 156.7 Hz ($61F); during further debate within the NCC processes, in 2001 the recommendation was changed to use the default ("carrier squelch equivalent") NAC of $293. There was agreement to continue to recommend the use of NAC $293 on the Interoperability Channels. It was noted that the NCC-developed guidebook for Regional Planning Committees still contains the reference to NAC $61F. It was agreed that the group should recommend updating the guidebook.

Following these discussions, Chief Bradley moved to develop a draft plan that would incorporate the following consensus decisions. Mr. Pletcher seconded the motion and it passed, with the State of Wisconsin objecting, noting that this plan did not differ greatly from the NCC scheme.

The channel numbers were grouped by band. The NTIA interoperability channels were removed from the numbering sequence. The existing NTIA "Red Book" designations were modified to add "FED" to designation. NPSTC will work with NTIA member agencies to agree on that format.

Channel numbers are grouped by band:

- Low Band 1-9
- High Band 10-39
- UHF 40-49
- 700 "A" (63 / 68) 50-69
- 700 "B" (64 / 69) 70-89
- 800 remains 90-99

The use of a 10 multiplier indicates a calling channel, for example, UCALL 40, etc., "Call" and "Fire" will be spelled out, and "EMS" is renamed "MED." The group wishes to avoid conflict in numbers with the legacy MED channels. The group recommended the deletion of 152.0075 (paging channel) from the list.

Closing Remarks

The task group recommended that this Report be submitted to NPSTC's Governing Board for acceptance, and, pending acceptance, be placed on Public Notice for a 90-day comment period. Following editing and the addition of footnotes, the Final Report would be placed on the agenda for adoption at NPSTC's June meetings. The Task Group will add recommendations for an implementation schedule. It is suggested that for spectrum below 512 MHz, as agencies narrowband, they adopt the new nomenclature;

in 800 MHz as agencies reband; and, in 700 MHz as systems come on, at their earliest convenience. The task group is also suggesting that grant guidance include changes in nomenclature as a funded item.

Mr. Haller thanked everyone for their work on developing consensus on this complex issue and adjourned the meeting.

Attachments:

Attachment 1: Attendees

Attachment 2: Preliminary Draft Consensus Spreadsheet reported out to the Interoperability Committee on February 6, 2007 and the NPSTC Governing Board on February 7, 2007

Attachment 1
Common Nomenclature Public Forum Attendees

Tom Abernethy
ARRL
P.O. Box 73
Accokeek, VA 20706
301-292-6263
w3tom@arrl.org

Douglas Aiken
Lake Regions Mutual Fire Aid
Chief
62 Communications Drive
Laconia, NH 03246
603-253-9111
daiken@IMSASAFETY.ORG

Chet Ashbaugh
FIRESCOPE
210 W. San Jacinto
Perris, CA 92570
951-453-6504
Chet.Ashbaugh@fire.ca.gov

Jeannie Benfaida
FCC
445 12th Street, SW
Washington, DC 20554
202 418-2313
Jeannie.Benfaida@fcc.gov

Sandra Betts
Collier County Sheriff's Office
3301 Tamiami Trail E
Naples, FL 34112
239-793-9175
911mgr@colliersheriff.net

Randy Bradley
California Fire Chiefs (Cal-Chiefs)
Fire Chiefs
PO Box 808, L-388
Livermore, CA 94551
925-423-1800
bradley7@llnl.gov

William Brownlow
AASHTO
Telecommunications Manager
444 N Capitol St NW Suite 249
Washington, DC 20001
202-624-5817
wbrownlow@aashto.org

Alan Bull
Region 39

Dave Byrum
P.C.S.O.
10750 Ulmerton Rd,
Largo, FL 33778
727-582-6310
dbyrum@pcsonet.com

Alan Caldwell
IAFC
Senior Advisor, Government Relations
4025 Fair Ridge Drive
Fairfax, VA 22033
703-273-9815 x 309
acaldwell@ichiefs.org

George Carbonell
State of Connecticut DOT/AASHTO
Transportation Radio Supervisor
280 West Street
Rocky Hill, CT 06067
860-258-0376
george.carbonell@po.state.ct.us

Ferdinand Cedeno
Puerto Rico
Chair
Box 41096 Minillas Station
San Juan, PR 00940
787-504-7110
fcedeno@coqui.net

John Chaney ?
Harris County, Texas

Cheryl Crate
Pegasus Communications
225 City Avenue, Suite 200
Bala Cynwd, PA 19004
202 262 6839
cheryl.crate@pgtv.com

Steve Devine
State of Missouri

Todd Early
Highway State Patrol - Texas DPS
Communications Coordinator
5805 North Lamar Blvd., Box 40
Austin, TX 78773
512-424-2121
todd.early@txdps.st.tx.us

David Eierman
Motorola
Principal Staff Engineer
7031 Columbia Gateway Drive
Columbia, MD 21046
410-712-6242
david.eierman@MOTOROLA.COM

Jeanne Elder
NPSTC Support Office
Program Manager
8191 Southpark Lane #205
Littleton, CO 80129
303-643-1842
jelder@highlands-group.com

Attachment 1
Common Nomenclature Public Forum Attendees

Bob Epper
Highlands Consulting Group
Director
8191 Southpark Lane #205
Littleton, CO 80129
303-643-1842
jelder@highlands-group.com

Bob Finney
Collier County Sheriff's Office
Technical Manager
3301 Tamiami Trail E
Naples, FL 34112
239-793-9498
commtech@colliersheriff.net

Brent Finster
FIRESCOPE
2010 Geary Rd.,
Pleasant Hill, CA 94523
925-941-3550
bfinster@cccfpd.org

Jesse Griggs
State of Tennessee Corrections

Carl Guse
State of Wisconsin

Ralph Haller
FCCA, NASF
Executive Manager
122 Baltimore Street
Gettysburg, PA 17325
717-334-7991
rhaller@FRCI.COM

Joe Hanna
Directions
President
8633 Southwestern Blvd. #337
Dallas, TX 75206
214-673-5478
locatejoeh@AOL.COM

Bill Hare?

Ron Haraseth
APCO Intl.
Director APCO-AFC, Inc.
351 N Williamson Blvd.
Dayton Beach, FL 32114
386-322-2500
harasethr@APCO911.ORG

Charlie Hoffman
NTIA EPPSD
Telecommunications Specialist
1212 New York Ave., NW, Ste 600 B
Washington, DC 20005
202-482-3456
choffman@NTIA.DOC.GOV

Ernie Hofmeister
Tyco - M/A-COM
Technology Fellow
221 Jefferson Ridge Parkway
Lynchburg, VA 24501
434-455-9555
hofmeiser@TYCOELECTRONICS.COM

Arnold Hooper
Public Safety
PO Box 5234
Chattanooga, TN 37406
423-593-8179
hooper_a@mail.chattanooga.gov

John Johnson
TEMA / APCO
TN Local Frequency Advisor
4130 Azalea Ct.
Murfreesboro, TN 37128
615-741-3826
tnadvisor@HEARTOFTN.NET

Paul Leary
NASF
709 Central Street
Franklin, NH 03235
603-934-0055
paulmaggie@verizon.net

Laura Lippman
NPSTC Support Office
Logistician
8191 Southpark Lane #205
Littleton, CO 80129
303-643-1842
llippman@highlands-group.com

Maribel Martinez-Bradwell
NPSTC Support Office
Assoc Director, Eng and Technology
74 North Pearl Street
Albany, NY 12207
518-443-2053
Maribel.Martinez@OFT.STATE.NY.US

Ron Mayworm
City of Bryan, TX
Radio System Engineer
PO Box 1585
Bryan, TX 77806
979-209-5475
Ron@KTSIGNALS.COM

Tim McClelland
FIRESCOPE
3800 N. Sierra Way
San Bernardino, CA 92405
909-881-6900
Tim.McClelland@fire.ca.gov

Attachment 1
Common Nomenclature Public Forum Attendees

Matt McCreary
NPSTC Support Office
Outreach Coordinator
8191 Southpark Lane #205
Littleton, CO 80129
303-643-1842
mmccreary@highlands-group.com

Kevin McGinnis
NASEMSO
Program Advisor
57 Central Street
Hallowell, ME 04347
207-622-7203
mcginnis@NASEMSD.ORG

Ross Merlin
DHS

Pam Montanari
Pinellas County Emergency Communications
Radio Systems Manager
12490 Ulmerton Rd.
Largo, FL 33774
727-582-2509
pmontana@co.pinellas.fl.us

Glen Nash
State of California
Senior Engineer
601 Sequoia Pacific Boulevard
Sacramento, CA 95814
916-657-9454
glen.nash@DGS.CA.GOV

Sean O'Hara
NPSTC Support Office
6225 Running Ridge Road
North Syracuse, NY 13212
315-452-8152
ohara@SYRRES.COM

John Penido
California Fire Chiefs and California SIEC

Robert Pletcher
Texas Department of Public Safety
Region 52
5805 North Lamar Blvd., Box 40
Austin, TX 78773
512-424-5307
robert.pletcher@txdps.state.tx.us

John Powell
Interoperability Committee Chair
Sr Consulting Engineer
790 Washington St, Ste 909
Denver, CO 80203
510-410-2858
jpowell@BERKELEY.EDU

Richard Reynolds
State of Delaware
Telecommunications Technologist
801 Silver Lake Blvd.
Dover, DE 19904
302-739-9648
Richard.Reynolds@state.de.us

Rob Richardson
Lake County, Florida
315 West Main St, Suite 411
Tavares, FL 32778
352-343-9458
rrichardson@lakecountyfl.gov

Paul Rinaldo
ARRL
444 Capitol NW
Washington, DC 20005
703 934 2077
prinaldo@mindspring.com

Bette Rinehart
Motorola
Regulatory Affairs Manager
28 Twin Lakes Dr.
Gettysburg, PA 17325
717-334-0654
c18923@email.mot.com

Don Root
San Diego County Sheriff's Department
Assistant Manager, Wireless Services
5555 Overland Ave Ste 5105
San Diego, CA 92123
858-694-3903
don.root@sdsheriff.org

Glen Savage
CDF
P.O. Box 944246
Sacramento, CA 94244
916-653-6622
glen.savage@fire.ca.gov

Jackie Siegel
NPSTC Support Office
Editor/Writer/Smiley Person
15 St Raphael
Laguna Niguel, CA 92677
949-715-0522
jackiesiegel@cox.net

McRae Smith
Raytheon JPS Communications
Business Development
43341 Royal Burkedale Street
South Riding, VA 20152
703-542-5573
mcrae.smith@JPS.com

Attachment 1
Common Nomenclature Public Forum Attendees

Jim Sobecke
National Capital Region (NCR)

Don Speights
FPIC

Vincent Stile
NPSTC
Chair
74 Pearl St
Albany, NY 12207
631-846-3686
stilev@APCO911.ORG

Marilyn Ward
NPSTC
Executive Director
318 Palmer Dr
Lexington, SC 29072
803-960-4339
mward@highlands-group.com

David Warner
Commonwealth of Virginia
Telecommunications Engineer
110 S 7th Street, 3rd Flr
Richmond, VA 23219
804-371-5212
david.warner@dit.state.va.us

William Waugaman
Kimball & Associates
200 Harbor City Blvd., Ste 202
Melbourne, FL 32901
waugaw01@lrkimball.com

Carlton Wells
State of Florida
4030 Esplanade Way
Tallahassee, FL 32399
850-922-7426
carlton.wells@dms.myflorida.com

Kenneth Yoder
Texas APCO
2504 Piping Rock Trail
Austin, TX 78748
512-280-9226
kyoder3@austin.rr.com

Attachment 2
Preliminary Draft Consensus Spreadsheet

FREQUENCY	BASE OR MOBILE	RADIO SERVICE	ORIGINAL NCC LABEL	CONSENSUS RECOMMENDATION	90.20(c) (3) LIMITATIONS	NOTES
		FCC 30 MHz Public Safety Band				
39.46	Base / Mobile	Police	**3LAW1**	**LLAW1**	15	
39.48	*Base / Mobile*	*Fire Proposed*	***3FIR2***	***LFIRE2***	*Proposed 19*	***Proposed***
45.86	Base / Mobile	Police	**3LAW3**	**LLAW3**	15	
45.88	Base / Mobile	Fire	**3FIR4**	**LFIRE4**	19	
		FCC 150 - 162 MHz Public Safety Band				
151.1375	Base / Mobile	Any Public Safety Eligible	**1TAC5**	**VTAC11**	27, 28, 80	
~~152.0075~~	~~Base / Mobile~~	~~Special Emergency~~	~~**1EMS6**~~		~~13, 30~~	***Recommend Deletion***
154.265	Mobile	Fire	**1FIR7**	**VFIRE22**	19, 28	
154.2725	Base / Mobile	Fire	**1FIR8**	**VFIRE24**	19, 27, 28	
154.28	Base / Mobile	Fire	**1FIR9**	**VFIRE21**	19, 28	
154.2875	Base / Mobile	Fire	**1FIR10**	**VFIRE25**	19, 27, 28	
154.295	Mobile	Fire	**1FIR11**	**VFIRE23**	19, 28	
154.3025	Base / Mobile	Fire	**1FIR12**	**VFIRE26**	19, 27, 28	
154.4525	Base / Mobile	Any Public Safety Eligible	**1TAC13**	**VTAC12**	27, 28, 80	
155.34	Base / Mobile	EMS	**1EMS14**	**VMED28**		
155.3475	Base / Mobile	EMS	**1EMS15**	**VMED29**		
155.475	Base / Mobile	Police	**1LAW16**	**VLAW31**		
155.4825	Base / Mobile	Police	**1LAW17**	**VLAW32**		
155.7525	Base / Mobile	Any Public Safety Eligible	**1CAL18**	**VCALL10**	27, 80, 83	
157.25	Mobile	Allocated for Public Safety Use in 33 Inland VPCAs/EAs	**1TAC19D**	**VTAC17**		
157.275	Mobile	Allocated for Public Safety Use in 33 Inland VPCAs/EAs	**1TAC20D**	**VTAC18**		
157.225	Mobile	Allocated for Public Safety Use in 33 Inland VPCAs/EAs	**1TAC21D**	**VTAC19**		
158.7375	Base / Mobile	Any Public Safety Eligible	**1TAC22**	**VTAC13**	27, 80	
159.4725	Base / Mobile	Any Public Safety Eligible	**1TAC23**	**VTAC14**	80	
161.85	Base / Mobile	Allocated for Public Safety Use in 33 Inland VPCAs/EAs	**1TAC24**	**VTAC17D**		
161.825	Base / Mobile	Allocated for Public Safety Use in 33 Inland VPCAs/EAs	**1TAC25**	**VTAC18D**		

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161.875	Base / Mobile	Allocated for Public Safety Use in 33 Inland VPCAs/EAs	**1TAC26**	**VTAC19D**		
		FCC 450 - 470 MHz Public Safety Band				
453.2125	Base / Mobile	Any Public Safety Eligible	**4CAL27D**	**UCALL40D**	27, 80, 83	
453.4625	Base / Mobile	Any Public Safety Eligible	**4TAC28D**	**UTAC41D**	27, 80	
453.7125	Base / Mobile	Any Public Safety Eligible	**4TAC29D**	**UTAC42D**	27, 80	
453.8625	Base / Mobile	Any Public Safety Eligible	**4TAC30D**	**UTAC43D**	27, 80	
458.2125	Mobile	Any Public Safety Eligible	**4CAL27D**	**UCALL40**	27, 80, 83	
458.4625	Mobile	Any Public Safety Eligible	**4TAC28**	**UTAC41**	27, 80	
458.7125	Mobile	Any Public Safety Eligible	**4TAC29**	**UTAC42**	27, 80	
458.8625	Mobile	Any Public Safety Eligible	**4TAC30**	**UTAC43**	27, 80	
		NTIA VHF Law Enforcement Channels				
162.0875	Mobile	NTIA Law Enforcement	**1FCAL35**	***FED LE 1***		***We will work with NTIA***
167.0875	Base / Mobile	NTIA Law Enforcement	**1FCAL35D**	***FED LE A***		***to develop***
162.2625	Mobile	NTIA Law Enforcement	**1FLAW36**	***FED LE 2***		***a revised plan***
167.25	Base / Mobile	NTIA Law Enforcement	**1FLAW36D**	***FED LE 6***		
162.8375	Mobile	NTIA Law Enforcement	**1FLAW37**	***FED LE 3***		
167.75	Base / Mobile	NTIA Law Enforcement	**1FLAW37D**	***FED LE 7***		
163.2875	Mobile	NTIA Law Enforcement	**1FLAW38**	***FED LE 4***		
168.1125	Base / Mobile	NTIA Law Enforcement	**1FLAW38D**	***FED LE 8***		
163.425	Mobile	NTIA Law Enforcement	**1FLAW39**	***FED LE 5***		
168.4625	Base / Mobile	NTIA Law Enforcement	**1FLAW39D**	***FED LE 9***		
		NTIA VHF Incident Response Channels				
164.7125	Mobile	NTIA Incident Response	**1FCAL40**	***FED LE 1***		
169.5375	Base / Mobile	NTIA Incident Response	**1FCAL40D**	***FED LE A***		
165.25	Mobile	NTIA Incident Response	**1FTAC41**	***FED LE 2***		
170.0125	Base / Mobile	NTIA Incident Response	**1FTAC41D**	***FED LE 6***		
165.9625	Mobile	NTIA Incident Response	**1FTAC42**	***FED LE 3***		
170.4125	Base / Mobile	NTIA Incident Response	**1FTAC42D**	***FED LE 7***		
165.575	Mobile	NTIA Incident Response	**1FTAC43**	***FED LE 4***		
170.6875	Base / Mobile	NTIA Incident Response	**1FTAC43D**	***FED LE 8***		

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167.325	Mobile	NTIA Incident Response	**1FTAC44**	***FED LE 5***		
173.0375	Base / Mobile	NTIA Incident Response	**1FTAC44D**	***FED LE 9***		
		NTIA UHF Law Enforcement Channels				
414.0375	Base / Mobile	NTIA Law Enforcement	**4FCAL45D**	***FED LE B***		
418.9875	Mobile	NTIA Law Enforcement	**4FLAW46**	***FED LE10***		
409.9875	Base / Mobile	NTIA Law Enforcement	**4FLAW46D**	***FED LE16***		
419.41875	Mobile	NTIA Law Enforcement	**4FLAW47**	***FED LE11***		
410.1875	Base / Mobile	NTIA Law Enforcement	**4FLAW47D**	***FED LE17***		
419.6125	Mobile	NTIA Law Enforcement	**4FLAW48**	***FED LE12***		
410.6125	Base / Mobile	NTIA Law Enforcement	**4FLAW48D**	***FED LE18***		
414.0625	Base / Mobile	NTIA Law Enforcement	**4FLAW49**	***FED LE13***		
414.3125	Base / Mobile	NTIA Law Enforcement	**4FLAW50**	***FED LE14***		
414.3375	Base / Mobile	NTIA Law Enforcement	**4FLAW51**	***FED LE15***		
		NTIA UHF Incident Response Channels				
419.2375	Mobile	NTIA Incident Response	**4FCAL52**	***FED NC 2***		
410.2375	Base / Mobile	NTIA Incident Response	**4FCAL52D**	***FED IR15***		
419.4375	Mobile	NTIA Incident Response	**4FTAC53**	***FED IR10***		
410.4375	Base / Mobile	NTIA Incident Response	**4FTAC53D**	***FED IR16***		
419.6375	Mobile	NTIA Incident Response	**4FTAC54**	***FED IR11***		
410.6375	Base / Mobile	NTIA Incident Response	**4FTAC54D**	***FED IR17***		
419.8375	Mobile	NTIA Incident Response	**4FTAC55**	***FED IR12***		
410.8375	Base / Mobile	NTIA Incident Response	**4FTAC55D**	***FED IR18***		
413.1875	Base / Mobile	NTIA Incident Response	**4FTAC56**	***FED IR13***		
413.2125	Base / Mobile	NTIA Incident Response	**4FTAC57**	***FED IR14***		
		FCC 700 MHz Public Safety Band (Ch. 63 / 68)				
Channel 23 & 24	Base / Mobile	General Public Safety Service (secondary trunked)	**7TAC58**	**7TAC51D**		
Channel 983 & 984	Mobile			**7TAC51**		
Channel 103 & 104	Base / Mobile	General Public Safety Service (secondary trunked)	**7TAC62**	**7TAC52D**		
Channel 1063 & 1064	Mobile			**7TAC52**		

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Channel 183 & 184	Base / Mobile	General Public Safety Service (secondary trunked)	**7TAC66**	**7TAC53D**		
Channel 1143 & 1144	Mobile			**7TAC53**		
Channel 263 & 264	Base / Mobile	General Public Safety Service (secondary trunked)	**7TAC70**	**7TAC54D**		
Channel 1223 & 1224	Mobile			**7TAC54D**		
Channel 39 & 40	Base / Mobile	Calling Channel	**7CAL59**	**7CALL50D**		
Channel 999 & 1000	Mobile			**7CALL50**		
Channel 119 & 120	Base / Mobile	General Public Safety Service	**7TAC63**	**7TAC55D**		
Channel 1079 & 1080	Mobile			**7TAC55**		
Channel 199 & 200	Base / Mobile	General Public Safety Service	**7TAC67**	**7TAC56D**		
Channel 1159 & 1160	Mobile			**7TAC56**		
Channel 279 & 280	Base / Mobile	Mobile Data	**7DAT71**	**7DATA69D**		
Channel 1239 & 1240	Mobile			**7DATA69**		
Channel 63 & 64	Base / Mobile	EMS	**7MED60**	**7MED65D**		
Channel 1023 & 1024	Mobile			**7MED65**		
Channel 143 & 144	Base / Mobile	Fire	**7FIR64**	**7FIRE63D**		
Channel 1103 & 1104	Mobile			**7FIRE63**		
Channel 223 & 224	Base / Mobile	Police	**7LAW68**	**7LAW61D**		
Channel 1183 & 1184	Mobile			**7LAW61**		
Channel 303 & 304	Base / Mobile	Mobile Repeater	**7MOB72**	**7MOB59D**		
Channel 1263 & 1264	Mobile			**7MOB59**		
Channel 79 & 80	Base / Mobile	EMS	**7EMS61**	**7MED66D**		
Channel 1039 & 1040				**7MED66**		
Channel 159 & 160	Base / Mobile	Fire	**7FIR65**	**7FIRE64D**		

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Channel 1119 & 1120	Mobile			**7FIRE64**		
Channel 239 & 240	Base / Mobile	Police	**7LAW69**	**7LAW62D**		
Channel 1199 & 1200	Mobile			**7LAW62**		
Channel 319 & 320	Base / Mobile	Other Public Service	**7TAC73**	**7TAC57D**		
Channel 1279 & 1280	Mobile			**7TAC57**		
		FCC 700 MHz Public Safety Band (Ch. 64 / 69)				
Channel 657 & 658	Base / Mobile	General Public Safety Service (secondary trunked)	**7TAC74**	**7TAC71D**		
Channel 1617 & 1618	Mobile			**7TAC71**		
Channel 737 & 738	Base / Mobile	General Public Safety Service (secondary trunked)	**7TAC78**	**7TAC72D**		
Channel 1697 &1698	Mobile			**7TAC72**		
Channel 817 & 818	Base / Mobile	General Public Safety Service (secondary trunked)	**7TAC82**	**7TAC73D**		
Channel 1177 & 1178	Mobile			**7TAC73**		
Channel 897 & 898	Base / Mobile	General Public Safety Service (secondary trunked)	**7TAC86**	**7TAC74D**		
Channel 1857 & 1858	Mobile			**7TAC74**		
Channel 681 & 682	Base / Mobile	Calling Channel	**7CAL75**	**7CALL70D**		
Channel 1641 & 1642	Mobile			**7CALL70**		
Channel 761 & 762	Base / Mobile	General Public Safety Service	**7TAC79**	**7TAC75D**		
Channel 1721 & 1722	Mobile			**7TAC75**		
Channel 841 & 842	Base / Mobile	General Public Safety Service	**7TAC83**	**7TAC76D**		
Channel 1801 & 1802	Mobile			**7TAC76**		
Channel 897 & 898	Base / Mobile	Mobile Data	**7DAT87**	**7DATA89D**		

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Channel 1857 & 1858	Mobile			**7DATA89**		
Channel 641 & 642	Base / Mobile	EMS	**7EMS76**	**7MED86D**		
Channel 1601 & 1602	Mobile			**7MED86**		
Channel 721 7 722	Base / Mobile	Fire	**7FIR80**	**7FIRE83D**		
Channel 1681 & 1682	Mobile			**7FIRE83**		
Channel 801 & 802	Base / Mobile	Police	**7LAW84**	**7LAW71D**		
Channel 1761 & 1762	Mobile			**7LAW71**		
Channel 881 & 882	Base / Mobile	Mobile Repeater	**7MOB88**	**7MOB79D**		
Channel 1841 & 1842	Mobile			**7MOB79**		
Channel 697 & 698	Base / Mobile	EMS	**7EMS77**	**7MED87D**		
Channel 1657 & 1658	Mobile			**7MED87**		
Channel 777 & 778	Base / Mobile	Fire	**7FIR81**	**7FIRE84D**		
Channel 1737 & 1738	Mobile			**7FIRE84**		
Channel 857 & 858	Base / Mobile	Police	**7LAW85**	**7LAW81D**		
Channel 1817 & 1818	Mobile			**7LAW81**		
Channel 937 & 938	Base / Mobile	Other Public Service	**7TAC89**	**7TAC77D**		
Channel 1897 & 1898	Mobile			**7TAC77**		
FCC 800 MHz NPSPAC Band						
821.0125	Mobile	Any Public Safety Eligible	**8CAL90**	**8CALL90**		
821.5125	Mobile	Any Public Safety Eligible	**8TAC91**	**8TAC91**		
822.0125	Mobile	Any Public Safety Eligible	**8TAC92**	**8TAC92**		
822.5125	Mobile	Any Public Safety Eligible	**8TAC93**	**8TAC93**		
823.0125	Mobile	Any Public Safety Eligible	**8TAC94**	**8TAC94**		
866.0125	Base / Mobile	Any Public Safety Eligible	**8CAL90D**	**8CALL90D**		
866.5125	Base / Mobile	Any Public Safety Eligible	**8TAC91D**	**8TAC91D**		
867.0125	Base / Mobile	Any Public Safety Eligible	**8TAC92D**	**8TAC92D**		

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867.5125	Base / Mobile	Any Public Safety Eligible	**8TAC93D**	**8TAC93D**		
868.0125	Base / Mobile	Any Public Safety Eligible	**8TAC94D**	**8TAC94D**		