

In-Building Emergency Communications Study Group

Meeting Summary: January 18, 2022 9:00 a.m. to 11:09 a.m.

Virtual Meeting: <https://vadhcd.adobeconnect.com/va2021cdc/>

ATTENDEES:

VA Department of Housing and Community Development (DHCD) Staff:

Cindy Davis: *Deputy Director, Division of Building and Fire Regulations (BFR)*

Jeanette Campbell: *Administrative Assistant, BFR*

Jeff Brown: *State Building Codes Director, State Building Codes Office (SBCO)*

Richard Potts: *Code Development and Technical Support Administrator, SBCO*

Paul Messplay: *Code and Regulation Specialist, SBCO*

Florin Moldovan: *Code and Regulation Specialist, SBCO*

Travis Luter: *Code and Regulation Specialist, SBCO*

Study Group Members:

Jamie Wilks: *Madison County Building Official; VA Building Code Officials Association (VBCOA) committee member; prior Building Official in Matthews County; Retired from Norfolk fire department*

Robert (Jonah) Margarella: *Architect at Baskervill (Studio Director); 24+ years in architecture; member of State Building Code Technical Review Board (SBCTRB)*

Steve Shapiro: *Retired Building Official, City of Hampton-34 years; LLC Shapiro Associates; Apartment & Office Building Association (AOBA); prior President of International Code Council (ICC)*

Dana Buchwald: *Senior Account Manager (in-building signal for emergency responders) at Backhaul Engineering*

Joseph (Tread) Willis: *International Association of Electrical Inspectors-VA (IAEI)*

Debbie Messmer: *Virginia Department of Emergency Management (VDEM)*

Troy Knapp: *Electric Plan Reviewer with VA Department of General Services (DGS), Division of Engineering and Buildings; prior Electric Plan Review Engineer 13 years William & Mary College; 20+ years Electrical Engineer*

Andrew Milliken: *VA Fire Chiefs Association (VFCA), VA Fire Services Board (VFSB) Chairman of Fire Codes and Standards Committee, (also submitted a proposal on this issue)*

Dwayne Tuggle: *Amherst, VA Mayor; VA State Police-retired*

Jim Crozier: *Virginia Association of Counties (VACO)*

Other Interested Parties:

Todd Strang: *Spotsylvania County Fire Official*

Sean Farrell: *Prince William County*

Study Group Members not in attendance:

Patrick Green: *Virginia State Police (VSP)*

Jodi Roth: *Virginia Retail Federation*

Robert Melvin: *Restaurant, Lodging & Travel Association (VRLTA), Director of Government Affairs*

Joshua (Jay) Davis: *Virginia Department of Fire Programs (VD FP)*

Gerry Maiataco: *Virginia Fire Prevention Association (VFPA)*

Tammy Breski: *Broadband Project Manager, VA DHCD Division of Community Development; prior Verizon Construction Manager*

AGENDA AND DISCUSSION ITEMS:

Welcome

Jeff Brown: Welcomed everyone. He gave a reminder that these meetings are being recorded for the purpose of preparing meeting summaries. This meeting is scheduled to run until 3pm, but it may end early. There will be breaks every hour. Study group members are listed in the box on the left of the main meeting screen. Meetings are open to all, but discussion and chat should only be between study group members. Individuals who are not study group members are welcome to reach out to a group member or DHCD staff to ask questions or share opinions outside of the meeting. The summary from the last meeting is posted on the DHCD website, with a link in cdpVA for review. He asked for the group members to check their microphones for correct operation.

Discussion

Jeff: There were good discussions and topics raised in the last meetings. There were some assignments, and group members brought back information for discussion in this meeting. The related documents were sent out to study group members and are also available to view or download in the 'files' pod on bottom left of the Adobe Connect meeting window. The end goal for this group is to provide a summary or report of all the discussions. He asked DHCD staff to begin working on that. He hopes to cover any remaining topics today, and identify all areas of agreement and disagreement. He is hoping that the group may be able to wrap up meetings today and potentially finish up via email. He asked everyone to speak up as needed. He noted that costs are something that the group may want to discuss further.

NFPA 1221 and 1225

Jeff: The 2021 IFC references NFPA 1221. NFPA 1225 is being considered for reference in later editions of the IFC. Dana looked into these further and provided document #6 in the 'files' box to the left on the screen. The document "NFPA 1225 vs NFPA 1221 – Dana" explains how the NFPA standards work with the IFC, the differences between the two standards and what it would look like moving from the 1221 to the 1225 as the newer standard.

Dana Buchwald: In 1225, the information is compiled in one place and is more user friendly than 1221. They changed some verbiage from ERCES to different terminology, opening up the type of communication to other types of technology. Cell technology has come up a lot, but there would still be a need for DAS infrastructure. Also, cell can't run too close to RF; they have to be a certain distance apart. The cost is significantly more (cell) under the guise of a third party, so there's not as much control as in a P25 system. They have lightened up on the cable requirements. Conduit is so expensive and is needed for the donor antenna. However, the requirements have lightened up on horizontal runs. The DAQ up to 3.0 is required, but that is subjective.

Jeff: The 2021 IFC requires a DAQ of 3.0. Is 1225 requiring the same thing?

Dana: It may be 3.4 in 1225. Critical area coverage (like under stairs) has gone to 99% in 1225, as opposed to 95% in 1221.

From Chat Box:

Paul Messplay-DHCD: 18.9.1 in NFPA 1225 requires DAQ of at least 3.0 09:12AM

Paul Messplay-DHCD: 510.4.1.2 in 2021 IFC also requires minimum 3.0 DAQ 09:15AM

Jeff: The 2021 IFC requires 95% in all areas and 99% in critical areas. It sounds like the 1225 has a lot of the same requirements. Any conflicting requirements of referenced standards would have to be handled through the USBC order of precedence. If the IFC matches the 1221 or 1225, there would not be a problem. However, if 1221 or 1225 have a different requirement than the IFC, the IFC requirement would take precedence. The IFC says that the system has to be designed in accordance with section 510 and the NFPA. They do not appear to conflict so far.

Dana: A 2-hour burn cable is not required in 1-hour building. For buildings with sprinklers, they back off on the cabling aspect.

Jeff: Asked if there were any other comments about the subject? He would like to have input from other members about how the standards work together with the IFC. If the group recommends that the 2021 VCC reference the IFC, and the IFC references NFPA 1221, as long as there are no conflicts, that should work.

Steve Shapiro: Should IFC sections 510.4 and 510.5 be directly referenced? They seem to capture all the requirements.

Jeff: If the group agrees on that, we could draft a code change proposal.

Dana: The IFC covers new and existing buildings.

Jeff: The focus of this group is only on new buildings. This is why there should only be a reference to technical requirements in new buildings, such as the requirements in sections 510.4 and 510.5.

Jonah Margarella: As an architect reviewing plans, referencing either the IFC or NFPA would be helpful as guidance to design a system.

Andrew Milliken: Making an amendment to the IFC to reference 1225 would not be preferable. It would be better to let 1225 come in to later IFC editions as planned.

Jeff: Agrees. It is better to not amend the IFC, as it would cause some confusion since it is not usually done.

UL2524

Jeff: The UL listing is required in 2021 IFC section 510.4. DHCD found a training document from UL explaining the requirements of the UL standard. It was sent to the group and is available to download from files box in the meeting room. He asked the group to review and consider the requirements.

FCC 47 CFR part 90.219

Jeff: Systems must comply with FCC 47 CFR part 90.219. Dana provided that document. Jeff asked if there were any questions or comments.

Steve: Heard that the federal regulation stipulates who can license the systems. He thought it had to be the locality as per the CFR.

Dana: The only licensing is the FCC licensee. Permits for in-signal boosters are needed in some jurisdictions, but not others. Licensing the system also varies by jurisdiction, but she doesn't think it's mandated anywhere.

Troy Knapp: System licensing is taken care of under the FCC license holder agreement. The FCC license holder has to approve the installation of the particular system. That's the only licensing he's aware of.

Dana: She agrees with Troy. The only other licensing she has heard of is by jurisdiction for whatever they may want. They may refer to it as a license or a permit. The FCC licensee ensures that the radio signal is owned and that the frequencies are approved so that there's no interference. That's the only actual licensing she's aware of. Whomever is in control of the system in that area is to make sure that there's no interference to the frequencies of other owners.

National Data

Jeff: Andrew and Jay provided information in documents sent to the group, and available in the file box.

Andrew: Provided a document, and since then, he looked at all of the states. 47 of 50 states required new buildings to have in-building communication systems. Indiana and Minnesota allow the localities to decide and dictate what is required. Virginia is the only state now that has a combination of owner and locality requirements. The vast majority of states simply reference the IFC and enforce without amendment.

Jeff: Asked Andrew to send the remainder of that information he just shared, and it will be sent out to the group.

Steve: Just to clarify, 47 of 50 states require system installation and the owner is responsible?

Andrew: Yes, that's correct. The other 2 states (besides VA) allow the localities to make those decisions.

Jeff: Jay Davis provided a document from North Carolina, showing their Fire Code requirements in section 510. Jay was not on the call to discuss. Jeff showed the document to the group, noted that it's available in the files box and asked the group to review it.

NIST Public Safety Communications Research

Jeff: There was some discussion about this in past meetings. What is the future of these systems? Are there changes coming? What is the potential for cellular or LTE? The biggest concern is that whatever is put forward by the group should encompass discussion of the newest technology. Remembering that care must be taken

when mixing cell and RF, that they cannot be located too closely together. If a locality switches to cell or LTE, what would happen with the existing systems? Does every system have to be upgraded? What about wiring infrastructure?

Dana: Separation needs are true for straight cell. Public safety cell has to be separate from regular cell. It also has to be away from RF. Nothing should interfere with public safety. All over the country, P25 has been upgraded for emergency handheld devices. It doesn't seem likely that only cell would work.

Troy: He spoke with a systems integrator at RF Connect, which does both cell and public safety systems. A lot of cell systems are replacing hard-wired phones in buildings. Washington DC was first to go ahead with that with AT&T, but Verizon filed a lawsuit and won. There are problems with vendors and public safety liability. LTE or cell needs lots of data broadband connection. With handheld, there's not a lot needed and it's less expensive.

Jeff: It sounds like the technology is there, but it sounds like there are some challenges with implementation. Cell is being discussed, but not being used yet. He asked for the group to check and see if there's any other published information to say that it's going in that direction.

Troy: Reviewed a plan recently and got news that the City of Richmond fire department may be using cell phones, but he needs to confirm that.

Andrew: Could it be because there's no radio coverage?

Troy: No, it's new construction where there's no system installed yet.

Jeff: It sounds like currently most localities use handheld radios. On a national level, people are looking at new technology, but it doesn't sound like it's coming soon. We can provide commentary that some technology is being explored, but not being implemented in Virginia yet. Everyone is still using handheld with RF.

From Chat Box:

Paul Messplay-DHCD: Just spoke with Jim on the phone. He wanted me to relay that Orange county's P25 system is a combination system that uses cellular and RF. The units on their handhelds automatically switch between the two and dispatch can switch between them. If one of the signals drops, it automatically switches to the other 09:48AM

Other Fees (FCC, local radio authority, etc.)

Jeff: It seems like fees may be administered by local authorities, if there are any at all. This has already been discussed and it seems like there's nothing new to add.

From Chat Box:

Paul Messplay-DHCD: From Dana with regard to "Other fees": "There is nothing much to say in terms of permitting costs, it's across the board from 0 to whatever the locality decides, the joke is 0 to a million. There is no formula or standard and there's no charge from the FCC. Typically the electricians or Fire Alarm folks will be pulling permits." 09:51AM

System Costs

Jeff: This will be a question and concern for some stakeholders, especially if there's consideration for some proposals like the one Andrew submitted, which would switch responsibility to the building owner. He asked the group to look for representative examples of real life applications.

Steve: Spoke with an engineer yesterday, who will get him prices on various actual new projects:

1. High-rise commercial office building with 25 stories, about 560k square feet, courtyard, fitness center, food service restaurants and an underground parking deck
2. Low-rise commercial office building with 4 stories, about 40k square feet
3. High-rise multi-family building with 16 stories, about 178k square feet, 154 units, underground parking and fitness center

He hopes to have the data by the end of the week and he will provide it to the group as soon as he gets it.

Troy: The system integrator he knows says that cost is based on size. About \$1k to \$5k for small to large systems. Most typically sign up for maintenance and monitoring which costs about \$1k to \$2k per year. Another individual he spoke with said it would cost about 50–75 cents per square foot for installation.

Jeff: Just to clarify, the \$1k to \$5k you spoke of was for the annual testing and recertification of the system?

Troy: Yes.

FEMA P25

Jeff: Jamie Wilks submitted a document in the file box.

Jamie Wilks: The FEMA P25 is an initiative at the federal level to ensure that whatever systems are installed work in mutual aid situations. Most states have mutual aid programs. This would ensure systems can talk to each other between localities.

Jeff: Thanked Jamie for providing the document. There have been questions in previous discussions about how to address how systems work in mutual aid response situations.

2021 IBC Section 2702.2.3

Jeff: DHCD staff discovered another section in the IBC that discusses emergency responder communication systems. Most of the IBEC requirements are found in chapter 9, but this one is related to providing back up emergency power to these systems. It says that standby power at 100% for 12 hours is required. The group should consider and decide if this should be referenced, and if the owner or locality should be responsible to provide. It should also be compared with chapter 9 to see if there is any conflict.

{BREAK 10:00 to 10:07}

Jeff: Does anyone have thoughts or comments on the section 2702.2.3 requirements?

Tread Willis: The National Electric code is for legally required emergency stand by systems. Their standard is 1.5 hours for battery backups. 12 hours would need a generator and who would provide one? It could be a big cost. Multiple inverter systems could provide the 12 hours, but it could be problematic if owners or localities were forced to supply a generator.

Jeff: It does sound substantial. The biggest question now is if chapter 9 says that the owner provides the infrastructure and the locality provides communication equipment, who would provide the standby power? This will probably come up at some point and have to be addressed.

Troy: VCC 1008 specifies 90 minutes for emergency lighting only. 12 hours is not dictated by the National Electric code.

Jeff: This is a current section in building code, so it needs to be addressed. The NEC is a referenced standard, but the IBC still requires the 12 hour backup.

Steve: He looked at the 2015 IBC, and backup required was 24 hours and in 2018 it changed to 12 hours.

Andrew: The discussion is about standby power, not emergency power. The 90 minutes refers to getting people out of a building in an emergency situation. He recalls that the 24 hours was reduced to 12 hours because it pushed some buildings into tying it into the generator. The intent of the 12 hours in this section (he thinks the listing of the system requires 12 hours of battery backup) is similar to providing batteries for the actual components of the system, which wouldn't necessarily require a generator. Moving from the model code language, it is a point of confusion and conflict.

Jeff: If the 12 hours is typically something that's handled through batteries in the system, the issue would be taken care of. The problem would occur if there were a generator needed.

Dana: Agrees with Andrew. She's looking at a battery backup system now. It is for the system itself. She has never run into a generator issue. The 12 hour backup is for the system, and it is normal.

Jeff: If the 12 hours is specified in UL or in IFC 510, why is this section needed at all? Having this requirement in chapter 27 seems to complicate things. This may have been overlooked or come into effect after the original IBEC state amendments.

Steve: The 2021 IFC section 510.4.2.3 says that dedicated stand by batteries or 2 hour standby batteries connected to the generator in accordance with section 1203 are required. It also says that 12 hours stand by is required. He thinks it would work to reference that section of the IFC, which also agrees with the IBC section 2702.2.3.

From Chat Box:

Paul Messplay-DHCD: IFC section link: https://codes.iccsafe.org/content/IFC2021P1/chapter-5-fire-service-features#IFC2021P1_Pt03_Ch05_Sec510.4.2.3 10:19AM

Paul Messplay-DHCD: In-building, two-way emergency responder communication radio coverage systems shall be provided with dedicated standby batteries or provided with 2-hour standby batteries and connected to the facility generator power system in accordance with Section 1203. The standby power supply shall be capable of operating the in-building, two-way emergency responder communication coverage system at 100-percent system capacity for a duration of not less than 12 hours." 10:19AM

Jeff: If this group puts together a proposal and references 510.4 and 510.5, it should also be clear who is responsible to provide the battery backup. It should also cover the IBC requirements.

Andrew: The UL listing also requires 12 hours of battery backup at 100% capacity (slide 13 in the presentation provided).

Jeff: If we reference the IFC for design of these systems, it would be best to delete this section in Chapter 27 to avoid confusion, since it's covered already in the IFC and NFPA.

From Chat Box:

Paul Messplay-DHCD: FYI: The national data summary provided by Andrew has been updated in the files pod. Please download the most recent version 10:25AM

ERCES Standard Proposal

Jeff: There's one proposal in cdpVA that has already been submitted. We will likely get more. Proposals are due February 1st as a deadline to get to the first Workgroup meetings in March. The proposal is to amend section 918 to reference NFPA 1225 and require UL2524 listing (there are no changes to general, installation, or responsibility sections). He asked the group members to read the proposal. He noted that the group is not required to take any action on this proposal, unless there is unanimous agreement to support or not support the proposal. There will still be opportunity to comment on cdpVA or at the Workgroup meeting in the first week of March. Andrew mentioned that it may be too soon to reference 1225, since 1221 is already in the IFC.

Steve: What does "minimizing noise" mean in the reason statement, item 3, second bullet? In accordance with the CFR standard, the license holder is responsible for retransmission of the frequencies to which the licensee is licensed and is required to review and approve every IBEC enhancement system prior to installation.

Dana: In the exceptions, looking at number 3 - just because a building is one story, it doesn't mean it would qualify for an exception. At first, I thought 20k square feet would be too large, but it is probably ok, depending on what the building is made of. In exception 6 - buildings in localities that do not provide additional communication equipment required to operate the system - is that up for debate?

Jeff: The code change proposal is showing the existing code sections that are being amended, and only the underlined text is new (all other text is existing regulation). The change is proposing to add a new section to the 2021 VCC Section 918 referencing NFPA 1225 and requiring UL2524 listing

Jeff: Whatever this group puts forward, there will be a summary about what is agreed on and what is not agreed on.

Other

Jeff: Explained how to move forward with proposals. This group may provide a proposal, but will definitely provide background information and the group discussions, including areas of agreement and disagreement.

Steve: Comments to proponents of the ERCES standard proposal – what does the bullet about minimizing noise mean, and how would it be implemented?

Jeff: Will send along that question to the proponents.

Dana: Gave her understanding of what the "minimizing noise" bullet means. If someone is putting in a BDA for a building, they provide the antenna and call sign. The licensee has to sign off with their approval and give provisional transmission authorization. It lets the licensee know that whatever is used doesn't interfere with what is existing. It's just an approval from the licensee before installation.

Jeff: He has a question for the proponents similar to Steve's. They make a statement and reference 1225. Are they trying to say that this is something new that 1225 brings, or are they saying that by not referencing the IFC or any NFPA standards, they are missing out on that piece?

Jeff: Does everyone support DHCD or someone in the group drafting a proposal taking section 918 in the VCC, and incorporating references to IFC Sections 510.4 and 510.5 for the design and installation of IBEC systems? This would also incorporate the references to NFPA 1221 and UL2524 requirements. He asked for the group to vote with thumbs up or down. All group members voted thumbs up. Dana, Debbie, Dwayne, Jamie, Tread, Jonah, Steve, Troy and Andrew agreed. DHCD will draft the proposal and anyone else who volunteers can help.

Steve: Is there a consensus to delete IBC standby power, since it's covered by IFC?

Jeff: Asked the group to vote on that – deleting IBC standby power requirement from the VCC (since IFC and 1221 will be referenced)? All in favor. Everyone in the group voted yes. Jeff will include that change in the draft proposal as well.

Andrew: Likes having consensus. He asked for a vote to see where everyone stands on the question of responsibility.

Jeff: Any discussion on who is responsible?

Steve: He's willing to have more discussion and bring back to AOBA for their opinion. Retail Federation and Restaurant, Lodging and Travel may also have concerns.

Jeff: DHCD can help by contacting members that are not present today to ensure that we have input on the outstanding topics, so Andrew can finalize his proposal for submission in cdpVA. We can also determine who supports the proposal and assist in adding them as co-proponents.

Andrew: What is the timeline? Feb 1st?

Jeff: Feb 1st is the cutoff to get proposals in for the first set of Workgroup meetings. For the second set of workgroup meetings in April, the cutoff is March 12th.

Andrew: Will work on it, It may be good to see the first proposal before he completes his to sync up.

Jeff: That sounds good. Getting everything in by Feb 1st sounds tight. If the proposal is in by March 12th, there are still 2 more rounds of meetings in April and June.

Andrew: How about the 6 existing exceptions in the VCC? It would be good to look at them, since they are specific to VA.

Steve: Will go to AOBA to discuss. Exception 6 was just added in the 2018 VCC, but is proposed to be stricken in Andrew's proposal.

Jeff: Anyone else?

Troy: The VCC states something about anyone using communication systems. Some people he speaks with think that systems are only used by fire departments. Others are using them besides the fire department, the systems are used by all first responders.

Jeff: There could be commentary language in the IFC, but the VCC is clear that it's for all emergency responders. A proposal from the group could make it very clear that it's not just for fire officials.

NOTE: Troy contacted DHCD staff after the meeting and provided the following definition from the 2018 VCC that clarifies that IBEC systems are intended to benefit all first responders:

"EMERGENCY PUBLIC SAFETY PERSONNEL. Emergency public safety personnel includes firefighters, emergency medical personnel, law-enforcement officers, and other emergency public safety personnel routinely called upon to provide emergency assistance to members of the public in a wide variety of emergency situations, including fires, medical emergencies, violent crimes, and terrorist attacks."

Assignments and Next Steps

Jeff: DHCD will draft a proposal, anyone in the group is welcome to assist. He will not schedule next meeting yet, until more information is gathered. If there's another meeting needed, DHCD will send a Doodle poll for the date.

Jeff: anything else?

Dana: FirstNet doesn't replace a system, it augments it.

Jeff: Does anyone have documentation related to handheld and RF working in conjunction with Cell and LTE? Any documentation on emerging new technologies to summarize and support what technologies are used now, when new technology might be coming, and what upgrades might be required?

Dana: It cost a fortune to upgrade to P25, and this was recently done not just throughout VA, but all over the country. She doesn't think there will be a massive change from that soon since everyone just invested in new P25 systems. They are tried and true.

Jeff: We can summarize this discussion in our report, but so far we really only have statements and no data on this topic. Are there any whitepapers or anything else published about this to support that there is no change expected in the near future?

Dana: Even if newer technology is wanted, there's still infrastructure, providers, maintenance, fees, etc. involved driving the cost up. She doesn't think that will be easy to pass.

Jeff: He knows the question will come up, so the group will include in their summary. He thanked everyone for their time and closed the meeting.

Additional Information needed:

- Jeff asked Andrew to send over documentation to support that 47 of the 50 states required new buildings to have in-building communication systems, with Indiana and Minnesota allowing localities to decide.

- DHCD staff will ask proponents of the ERCES standard proposal:
 - What does the bullet about minimizing noise mean, and how would it be implemented?
 - Also, they make a statement and reference 1225. Are they trying to say that this is something new that 1225 brings, or are they saying that by not referencing the IFC or any NFPA standards, they are missing out on that piece?

- Regarding Andrew's proposal:
 - Steve will bring back to AOBA for their opinion regarding responsibility and striking exception 6. Retail Federation and Restaurant, Lodging and Travel may also have concerns.
 - DHCD will help gather input from members, especially those not in attendance today, to assist Andrew in finalizing his proposal and can also assist with adding co-proponents in cdpVA before March 12.