

In-Building Emergency Communications Study Group

December 29, 2021 9:00 a.m. to 1:40 p.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)*

Paul Messplay: *Code and Regulation Specialist, SBCO*

Florin Moldovan: *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*

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

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)*

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

Other Interested Parties:

Todd Strang: *Spotsylvania County Fire Official*

Study Group Members not in attendance:

Patrick Green: *Virginia State Police (VSP)*

Jodi Roth: *Virginia Retail Federation*

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

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

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

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

AGENDA AND DISCUSSION ITEMS:

1) Welcome

Jeff Brown: Thanked everyone for attending. Asked for members to stay muted unless they are speaking. The meeting is open to anyone, but only Study Group members should join the discussion. He noted that Patrick Green, Jodi Roth, Gerry Maiataco and Jim Crozier were not in attendance last week, and may not be on today. He allowed Tread Willis (IAEI) and Jay Davis (VDFF) to introduce themselves to the group, as they were not in last week's meeting.

The group objectives are to look at the issues surrounding in-building emergency communication systems, define areas of agreement and disagreement, look at the technical requirements in the code, discuss costs and responsibilities related to these systems and clarify this data for the Board of Housing and Community Development. All proposals made will be discussed. We currently have one draft proposal made by Andrew Milliken, which is on the table for discussion.

Notes will be taken in all meetings, including outstanding questions or issues, as well as areas of agreement. Questions will be researched by DHCD or assigned group members to provide answers. At the conclusion of the meetings, the group's findings will be summarized and reported to the Board, including the items of agreement.

2) Discussion:

Background of Virginia Requirements

Previous IBEC Feasibility Study (HJR588)

Jeff: There were some questions at the first meeting about the history of the IBEC requirements in the code. In 2003, there was a feasibility study done. There was legislation that directed DHCD to develop regulations related to IBEC systems and a joint resolution to conduct a feasibility study regarding potential IBEC regulations. The feasibility study (file attached) gives the background from 2003: discussion, issues, questions, findings, etc. Jeff thinks many of the same topics and issues will arise in this study group, so it will be important to see what was discussed in the feasibility study, and what is different since then. They discussed a broad range of the potential costs of system installation, but those have probably changed, so we will need to revisit the topic and gather updated data. He asked if there were any questions or comments about the study.

Dana Buchwald: asked if the group is only addressing new construction, and why? (Besides cost).

Jeff: Anything is open for discussion: what's required, what are options, what are pros & cons about new vs. existing buildings. In the past, the discussions did not include existing buildings. Andrew's proposal also does not address existing buildings. It is rare that there is a building code requirement for retrofit of existing buildings, though there are examples. Previous retrofit provisions have been implemented through legislation. Discussions will be noted in the final report, including talk around new vs. existing buildings, and where the group lands on that issue.

Dana: Specifically asked because she speaks with a lot of AHJs and fire marshals, who have said that they are afraid to go into some buildings, because they don't have a proper signal.

Andrew Milliken: Regarding new vs. existing buildings, he thinks it's important for the group to comment on both for the purpose of arriving at consensus. The VA code does speak specifically to new construction, so the group should prioritize that discussion. He still thinks it's beneficial to provide information on existing buildings.

Jay Davis: Regarding old vs. new buildings, in areas with some density, most localities deal with the ability to communicate in the buildings as they are constructed. When construction continues in the area, the systems can overlap and interfere with each other. Boosters may be needed to achieve clear communications. Localities may need to look at signals each time new construction is done. It isn't one and done, there is a need for constant checks and balances as growth continues. He thinks the group does need to discuss what happens after installation.

Jeff: Agrees with Jay. There is a responsibility question – who is responsible for system upgrades when needed? Currently localities are responsible for the systems and any upgrades, but the group will discuss responsibility

not only as it relates to design and installation, but also maintenance and upgrades. Additionally, the FCC may require frequency changes, so the group would want to discuss what that would look like, how often would it happen, and who would be responsible for any upgrades?

Steve Shapiro: The feasibility study mentioned that a retrofit requirement could add 10-25% to the cost of a system, which would have a big impact.

Jonah Margarella: The IFC and VCC reference maintenance, testing and proof of compliance in section 510.6. Is that enough to keep validating the system over time?

Jeff: That is a good question, and it will be important keep it in mind during discussions about inspections and maintenance testing requirements and costs.

Tread Willis: The cost of retrofit requirements can be tremendous and could be infeasible or impractical. However, he thinks the group should consider the occupancy change language in chapter 7 of the existing building code (VEBC), and the increase in square footage qualification in Andrew's proposal to determine if, under certain circumstances, retrofitting could be required. He doesn't actually like the idea of doing that, however, the current existing building code says that a change of occupancy could actually require a new sprinkler system to be installed. Could the same apply for IBEC systems?

Jeff: Agrees that the VEBC would be the right place for any requirements related to existing buildings.

Development of Initial Virginia Code Requirements

Jeff: Drafts and the final code change proposal that was submitted to the BHCD:

Between the years of 2003-2007, there were many discussions and attempts to reach consensus. In 2007, a proposal from Cheri Hainer titled "IBEC proposal 2007.10.10" (attached) finally had an acceptable compromise. That document and the feasibility study together are good background information regarding how the existing IBEC code requirements were developed. He advised the group to look at these and all of the related documents sent out on Dec 17th for more background.

Dana: Was looking at the NFPA 1225 2022 (newest) edition considered (to see where the technology is heading)? For example, in the 2018 version, conduit wouldn't be required in every building and would save a tremendous amount of money. Was this addressed: looking at newer codes?

Jeff: It would be good to look at it and discuss. He asked Dana to captain that. Someone has submitted a draft proposal in cdpVA to incorporate 1225 into the 2021 USBC, but it's not fully processed yet. The group will start to look at the codes and standards more in the "system requirements" section (below).

Andrew Milliken Draft Proposal

Jeff: Andrew Milliken, representing the VFCA, drafted a proposal that is not officially in cdpVA yet. It is a good starting point, to see what a proposal for this cycle might look like (attached).

Andrew: Wanted to get something out to start discussions, and to bring section 918 in the new construction code back in line with the charge in Title 36. The main idea is to remove requirements for building owners to provide conduit, which serves no purpose, and to provide direction to code officials, in section 918.1.1, for what standards would apply to installation, and also meet the IFC standards. The proposal references NFPA 1221, not 1225, but the group can discuss further. He's trying to keep it concise and simple to get back in line with the charge in Title 36 and provide a new starting point for this section by removing excess requirements.

Steve: Who is responsible to provide the system in the building?

Andrew: The proposal keeps the same language that was found prior to 2018, requiring the building owner, where a system is necessary, to provide the system. This is similar to standpipe systems, where the building owner is responsible for installation.

Steve: What exactly would the owner have to provide?

Andrew: If the owner didn't meet the minimum signal requirements, or have attestation to prove that they could provide good communications coverage throughout the building, they would have to provide a 2-way IBEC system (DAS or bi-directional antenna system connected to the fire alarms). This is the same as the requirements in a number of states.

Troy Knapp: The difference he sees is that the Virginia code states 'providing radiating cable or equal' and then the locality would provide other equipment: basically amplifiers battery backup, together with acceptance testing. He thinks it's analogous to providing fire alarm horns and strobes in the building, but not providing the active equipment to make it work. The way it's setup - for the building owner to provide radiating cable or antennas, and for localities to provide amplifiers or other equipment to make it work - nothing else in the code is setup to work that way. It's not practical, not efficient, and it's no way to install a life-saving system in a building. It makes it hard to review plans, enforce the code and give guidance to engineers. It would be like putting emergency lights in and requiring the locality to put in a generator.

Dana: She agrees with Troy. It's nonsensical. To put the responsibility only on the building owner or only on the locality would be better. Most of the people she speaks to in localities do not have the money to do it all. Some other areas in the country provide tax breaks for existing buildings and new construction. Separation doesn't make sense.

Jeff: Yes. It's on our list to discuss what other states and localities are doing, and what their requirements are. Which ones don't require systems and which ones do, and how do they do it (who's responsible, and how do they offset the costs)? He sked for anyone to provide that type of information, and said it may be assigned at the end of this discussion or between now and the next meeting.

Troy: He recently (last year) joined the Safer Buildings Coalition. They are a group of manufacturers, engineers and AHJ's working through these types of issues, and trying to get consistency across the nation. They troubleshoot problems and interference with existing systems. He'll ask for information on what others are doing. One person in that group says VA is only one of a few states that require localities to provide anything. He said the IBEC systems are like fire alarm or sprinkler systems; the owners' cost of doing business and providing safe buildings. He hasn't looked at any cost documentation, but a particular owner said their cost was 50 to 75 cents per square foot. Troy will get more information as he can.

Jeff: Any information would be good. He is looking for a few sources to compare data. Anything on cost and what others are doing would be helpful to the group.

Steve: One question for Andrew regarding his draft proposal: why is the exception #6 (VCC Section 918.1) stricken - wasn't that exception just added in the 2018 edition of the VCC?

Andrew: Localities already aren't providing additional equipment and there is no additional equipment to provide in this proposal. He's proposing an all-in-one owner-provided life-safety system, like fire alarms, standpipes and sprinklers.

Dana: Agreed and asked if anyone is familiar with Fairfax. They have requirements that are well-done and are somehow being enforced. They say it's "highly encouraged and recommended" that all commercial, multi-unit residential, governmental and educational occupancies reliable on building code and safety...' similar to most jurisdictions in Florida. Fairfax put down the requirements in about 8 pages, although Tampa has like 40 pages. She spoke with the AHJ in Fairfax, who says everyone is on board, and it works fine for them. She has a stack of requirements from various jurisdictions. She knows of only 3 jurisdictions in VA that have written down their requirements (Arlington may be one).

Jeff: Some localities do have policies. He said he hasn't looked at them, but if they are not in line with code, it would be problematic. He thinks the best starting point for specific IBEC system design or installation requirements would be the existing model code requirements. Some Virginia localities currently have their own local policies to identify minimum system requirements or point to IFC or NFPA for specific requirements since the current VCC requirements are somewhat vague and do not reference the IFC. He asked that if Dana or anyone else has any information to share, she should get it to DHCD to share with group.

Troy: Has documents from Stafford, Loudoun and Arlington. Stafford's is published by the fire and rescue department, office of the fire marshal. It does have code references. He'll forward. He agrees with Jeff that they don't need to rewrite code if there's already code to reference regarding requirements.

Andrew: Is from Stafford. They have standards for when these systems are provided. They see developers come in and ask for the IBEC requirements, which is evidence that the industry requirement for infrastructure is usually on owner, and that VA is behind on this code issue.

Jeff: It would be helpful to see what other states require and to compare that information.

Jay: He retired from the city of Charlottesville in 2020. He worked on this type of project before he left. There, the construction process was part of the design features of a building. A document was handed to developers stating that the building could achieve communications, with specific language showing what the city uses, and that they expect builders to provide compatible 95% in-building communications without interference. The responsibility was on the developer and designer. They specifically referenced NFPA 72 and the fire code, but the building code didn't require it. When a building has already been built somewhere else, the developer would know how it interacted there/then. It was more complicated when a new building was proposed that had never been constructed before. They would then discuss at least providing space and conduit for equipment, so they could add after the building was constructed. He says they want to do the right thing, but what do they have to provide? He can provide the document from Charlottesville. The big thing is really giving clear guidance no matter what.

Jeff: The code is minimum now. He thinks the challenge is the missing link of design & installation standards. Even if nothing else changes, looking at IFC and NFPA and referencing it or somehow adding a little more guidance in the code regarding system requirements would be helpful. If there are at least design and installation requirements, it would give more clear guidance to designers, owners and localities to work with.

Steve: He assumes that the VA localities mentioned: Fairfax, Arlington, Stafford, Loudoun and Charlottesville are still in compliance with 2018 IBC section 918.1.1. He's hoping that they don't require more than what the current building code requires.

Dana: Fairfax references 1221 and 72 but it's not specific. Companies like Publix come in with designs they already have. They have a safety plan with towers already scoped out before construction. If builders would incorporate BDA in life safety plans, it would help with cost and time. A 2-hour burn room, for example, is something to put in during construction so it's known upfront and there is no cost or time wasted to put it in later.

Jeff: The question is who are we minimizing cost for? Even if someone comes in with a plan today for a building that already has a pre-designed IBEC system, installation responsibility would still fall on the locality. The building owner is currently not required to install the system.

{BREAK - 9:57am-10:05am}

System Requirements (IFC, NFPA, etc.)

Jeff: Wants to look at system requirements, setting Andrew's proposal aside for the moment. The code says that we need to ensure that the building has continuous IBEC. What are the various types of systems? What else besides amplifiers and antennas, etc. is available? Are there other systems that don't fit the mold of NFPA 1221 or 1225, or are they all encompassed in the existing standards and code requirements? Are there newer technologies to include in discussions?

Dana: She has seen mobile units and portable units. Instead of systems being installed during construction, these units can be dispatched as needed. She doesn't think they are a good solution. Whatever the system is, it needs to be UL 2524 rated.

Jeff: What types of systems does that UL rating cover?

Dana: It seems that the various systems are all similar: they have bi-directional amplifiers (BDAs), annunciator panels, 12- to 24-hour battery backups, alarms that are part of BDA in the fire panel, a remote shutoff if needed, repeater and signal booster. All of the manufacturers have or are working on the UL 2524 rating. They all seem to be the same.

Jeff: There are minimal system requirements in the code – what you mentioned. Primary differences may be in the in-between, wiring, and equipment for signal transmission, which could vary by manufacturer.

Jay: Localities have their own systems operating on 800 MHz or other types. The systems are able to address specific brands, like Motorola. The components that go with it also have to be installed according to code and be UL certified. The locality would be the driving factor to determine which system the building owner would need to use to interact with what the locality is using.

Dana: Agreed. It depends what tower, where and what frequency the AHJ wants. The first thing to consider is what the locality offers, and then the IBEC system requirements would be installed accordingly.

Tread: IFC section 510 says that the system must be designed by an FCC licensed person or otherwise adequately trained person, so designers would have to be responsible for equipment. In his county, (Prince William), the Fire Marshal's office reviews the system designs, and the IBEC system must be integrated into the fire alarm system as well, for notification if there's a failure. The requirements of the locality will drive the system needed. Similar to a building official listing the geographic design criteria for residential applications, the fire official needs to provide local specifications for builders to follow in the system design.

Jeff: Good point. He imagines other localities have language to that effect.

Dana: That is how it's done in most places. In order to install systems, you have to be certified by the manufacturer of the system. The locality would not be that person, it would be the design and install certified person. The installer needs to know the RF specifics for the locality.

Troy: Recently learned that NICET has just initiated a certification program for installation of IBEC systems. It's possible that language should include the NICET certification, which should be up and running by the time the code is put into action.

2021 IFC

Jeff: Reviewed the IBEC provisions of the 2021 IFC. Section 510.1 lays out requirements for where systems are required. This is in conflict with existing requirements in VCC chapter 9. If the VCC is updated to reference the IFC, it should not reference 510 in general, but only certain parts of 510 (i.e. design & installation 510.2, etc.) in order to not interfere with VCC.

Steve: Noted that Andrew's draft proposal only references sections 510.4 and 510.5.

Jeff: IFC section 510.2 covers existing buildings. 510.3 is about permits required, which is already covered by the VCC. Sections 510.4 and 510.5 are the ones that apply to this discussion. IFC 2021 Section 510.4 references the new UL 2524 listing requirement. 510.4.1 addresses the need for 95% adequate signal strength for 95% of the areas in the building. Does anyone have details about 95% signal strength and DAQ of 3? Also, when is this determined – can it be determined before the system is installed or before construction starts?

Dana: Typically, the building should be substantially constructed before testing because the building materials matter a great deal in signal testing. DAQ (delivered audio quality) is done with handheld radios, which is very subjective – how clear the communication is between 2 people. Additionally, the state requirements can be increased, but not decreased.

Jeff: Is the system testing in Andrew's proposal, or even in the existing VCC exception (owner provides technical documentation from a qualified individual that the structure doesn't impede signals) able to be done only after the building is substantially complete?

Dana: This is where a survey would come in. It's a heat map of the building showing what parts of the building have signal and what parts don't. Some say they want 99% in 'critical' areas and then 90-95 in other general areas. Jurisdictions can increase but not decrease these requirements. This testing only works when buildings are substantially built.

Jeff: In the design phase, if the builder doesn't think anything will impede, they would still need to prove it before they move on with construction, (unless they have exception 6 stating that they don't need an IBEC system in the building). Is that accurate?

Dana: Some signal information can be obtained in a green field. If it fails at that point, you will know that a system enhancement is needed. Typically, after substantial construction, a survey is done, which is a grid walk of the building or each floor in 20 sections, showing what the signal is. Sometimes, owners even include extra antennas throughout the building, which is overkill. However, if boosters are needed somewhere, they have to be there. Even in a huge building, it would only cost about \$5k or less for boosters everywhere to be super safe.

Troy: There are software packages available to analyze buildings in the planning phase (like the heat maps Dana mentioned). Those would help for cost and time management before ground is even broken. Walk through grid testing is used after buildings are mostly constructed. Some engineers put verbiage into the contract so that builders will include something that will pass the test.

Dana: What's used pre-construction is called a Rough Order of Magnitude (ROM) for building construction costs / budget purposes. It's usually overestimated.

Jeff: What percentage of buildings would require a system when tested? Most or few? Is it by area? Location?

Andrew: As an AHJ, he has seen a lot of times when a ROM is included, or another evaluation tool that is used before construction.

Dana: Yes, a ROM would be used before construction. The designer would get wave specs and tower locations together with a life-saving or electrical plan. This would be the time and place to determine if a system will be needed. It is usually done in coordination with electricians. Tread confirmed.

Tread: System monitoring will be done by a fire alarm contractor. It's not technically difficult, but practically, it would make sense to have fire alarm panel or command center centrally located in physical proximity for monitoring purposes. Distribution of cables is simple. Varied electric materials are acceptable. The problem is when the building has a fire alarm control panel in a dedicated space and the radio equipment is not.

Jay: What percentage of buildings would need an IBEC system? This is a crucial point, because in Virginia, there are lots of different terrain that could encourage or inhibit transmission (beach, mountain, valley, etc.). Locality is also important in this discussion. A Locality may have a good tower grid and good boosting system, whereas other areas may not. At other times, the building itself could be a crucial component. If, for example, a hospital has great coverage, but installs an MRI and has signal interference – what then? The group would want to address the need for enhancement in that case. So, it depends on where (terrain & locality signal strength provisions), building type and modifications.

Jeff: Yes, this was looked at heavily in the feasibility study. Part of the issue is that if you require certain coverage in building, how can that happen if locality doesn't provide the signal at the site to begin with? Per 510.4.1.1, if you need a minimum of 95% and DAQ of 3, what if the signal available at the exterior of the building is inadequate? Is there a baseline for a locality to provide a certain signal strength?

Steve: Wanted to clarify a point. A ROM test would tell you how to design a system, but wouldn't say if you need one or not. Is it correct that the building would still have to be substantially complete to definitively say if a system is needed or not?

Dana: Yes. The ROM would really be used for budget purposes. A building with 5 stories is more likely to need a system than a one-story building (in general, but it could be different based on location). She hasn't seen a large building yet that doesn't need one. RF is cut by concrete, steel, other buildings, water, low E glass, etc...

Andrew: The locality signal is discussed in 510.1, but his proposal doesn't address this. The IBEC 2-way system is based on the existing signal measured at exterior of building.

Jeff: IFC Section 510.4.2 says the system has to comply with sub-sections 2.1-2.8 and with NFPA 1221. In Section 510.4.2.1, structures need enhancement when required as per specifications in 510.4.1-510.4.3. Systems with RF emitting devices have to be approved by the fire official before installation. They also have to be certified by the radio licensing authority and be suitable for public safety use. Can someone explain this approval process?

Jay: Localities have a communication system center and whomever oversees it would know the system and signal strength. He noted that if many others start building around that area, existing buildings might need to adjust their amplification, due to potential signal interference. This should be left to the local communications system personnel to determine.

Jeff: So, a fire official has to review and approve, but also the local system person whom Jay referenced.

Troy: There's a document that also has to be signed by the FCC license-holder to ensure that the system isn't interfering with other signals. Reference section 510.5.2

Jeff: Section 510.5.5 also refers to compliance with FCC regulations.

Dana: agrees. The FCC licensee has to sign off together with the AHJ after the system is installed. Also an annual test and a 5 year test is needed, using a retransmission authorization document.

Jeff: Section 510.4.2.2 technical criteria – a fire official keeps a document giving designers specific (local) technical criteria.

{BREAK - 11:02am-11:07am}

Jeff: Reviewed standby power 510.4.2.3, signal booster 510.4.2.4 and system monitoring requirements 510.4.2.5.

Andrew: Most of these requirements are the same as the UL requirements, so this is good – they match.

Jeff: 501.4.2.6, 7, 8 – read off requirements for additional frequencies and change of frequencies, design documents and other technical design requirements.

Jeff: Section 510.5 says that installation requirements need to be in accordance with NFPA 1221, 510.5.2 and 510.5.5. Jeff asked what exactly does NFPA 1221 say – is it in agreement with everything else in section 510? If anyone can supply, it would be helpful. However, he asked group members to be careful - don't supply copyrighted documents - summaries of the requirements for discussion would be best.

Jeff: went over 510.5.1, .2, .3, .4, .5 installation requirements. 510.5.1 discusses mounting of donor antenna, signage and approval. Sections 510.5.2 and 510.5.3 discusses installation of amplification system, licensing and approval. Section 510.5.1.4 outlines the acceptance testing procedure. Section 510.5.1.5 mentions FCC compliance, and references FCC 47 CFR part 90.219, which the group will need to review further.

Jeff: Another situation to consider is when different jurisdictions (1st responders) come together in a single location; how does that work with an IBEC system?

Jay: In mutual aid agreements, the local jurisdiction is the unified command for all. They will give out their handsets or have other localities adjust their handsets to what the command center dictates. This is accomplished with an 'Incident Management System'.

Jay: Regarding certification and licensing. Will this be added into the proposal, or just referencing IFC?

Jeff: Good point. If Andrew's proposal is used, it specifically references section 510.5, which lists specific minimum qualifications. A question to consider is should section 510.5 be referenced, or should it be deferred to the fire official to determine? Either way, this is separate from licensing requirements – If a contractor's license is required, that would be through DPOR and would be separate from and in addition to any minimum qualification requirements of the code.

Dana: Whomever installs the system has to be certified by the manufacturer (ex: Honeywell), and whomever performs the annual and 5 year inspections has to be certified to cover that manufacturer's system. The certification requirement therefore, kind of handles itself, since it will void the warranty if not adhered to.

Jeff: summarized section 510.6: maintenance. 510.6.1-testing; 510.6.2-additional frequencies (cost on the building owner); 510.6.3-nonpublic; 510.6.4-field testing. All of this is maintenance and could have costs associated. These costs should be addressed by the group, or see if it is already addressed elsewhere.

Andrew: It is already in addressed in (2018 SFPC) section 510.3

Cindy: In Virginia now, when a building is approved as code compliant, you don't have to keep upgrading things to bring them up to current codes. Whose problem is it when another building is built next-door, or something else happens to impede the signal after a system is approved? She asked if anyone in the group is familiar with the NIST research happening now around first responder communications, or if anyone is involved in any other work that may affect future codes in this area, which could be incorporated now?

Jay: On existing buildings, if construction is completed and C.O.s have been issued, then yes – who is responsible, especially if a neighbor builds something that interferes? If localities change signal strength, the localities would have to adjust everyone's system accordingly (not a cost to building owners).

Cindy: If a locality adjusts signal at no cost, it is a non-issue for this group. However, all costs and any kind of retrofit is an important question to discuss. If systems are required, who, how, when, cost, etc...for updating? In the past, retrofit has only been done by legislation.

Installation Responsibility

Jeff: Another thing to consider – what if you're putting the new building in an established area and others have their signals set until you come in? Would the new building owner carry the cost to adjust all the other building signals or systems? Is there any example today that anyone can share on this? Who is responsible?

Dana: In Florida, there are class 'a' and class 'b' systems, depending on area density. If an established building owner has an annual inspection, and changes are needed, the building owner is responsible to adjust. It also depends on tower location, so it's difficult to give a blanket answer to anything. For the most part, it's understood that owners just have to live with what's there, what they have, what happens after... The main

thing is the main system (infrastructure). If that's as it should be, you can always add, remove or adjust antennas / boosters at an unsubstantial cost.

Andrew: If a locality determines a lack of coverage, they should be in the mix of fixing it. In the past, it was like throwing the baby out with the bathwater by saying that there wasn't an easy solution to existing buildings, so drop the whole issue. Now, it's pretty important to discuss primarily new buildings, so that there can be a focus on the system issues across the board, as charged in Title 36. Existing buildings should be a separate issue and discussed separately.

Steve: has the same question as Cindy. AOBA isn't in favor of building owners taking any additional responsibility. It isn't right for existing owners to take on the cost for a neighbor putting up new building and impeding the signal in their building. It doesn't make any sense at all.

Jamie: It goes back to the current code language for installation – the owner will install and the locality is also responsible. It's not like other issues, where there are details about who is responsible for what, and a clear delineation. Installation is also not clearly described – no guidelines or reference to standards.

Jeff: Even if no changes are made to responsibility, should there be more specifics about installation requirements? Localities are handling this now through local policies (as discussed earlier), since there aren't specifics. What is the current consensus in the group? (Is everyone in agreement that the current VCC requirements should be amended to include more specific design and installation information?)

Jay: He doesn't have a problem with leaving the code as it is now regarding installation requirements. Localities are handling that now. For existing buildings, he agrees with Andrew that it's better to not discuss existing structures now, because there won't be any progress on new construction.

Jeff: With other systems, the owner maintains them as approved, and doesn't need to pay to upgrade. The existing building discussion can be had later, but it won't hold up the new construction discussion now.

Steve: As far as agreeing to update the VCC to reference IFC sections 510.4 and 510.5, he wants to consult with his association for additional guidance.

Andrew: Also agreed that it's a valuable discussion, but to keep in mind the Title 36 mandate for IBEC systems in new construction.

Dana: There is discussion happening regarding K-12 schools now, as far as upgrading existing structures, however implementation keeps getting kicked down the road. The Safer Buildings Coalition is lobbying for this presently. Perhaps discussion around IBEC systems in existing buildings could be something that would require implementation in a future date?

Jeff: Summarized things that were discussed in this section, and asked if there were any other things to consider.

{LUNCH BREAK 11:57am – 1:00pm}

System Costs

Jeff: wanted to start identifying what the costs may be for the locality and/or building owner – for the current code, proposal(s) and any other discussion.

Jeff: Permit fees: does anyone know about or have experience with this?

Andrew: Yes. His experience is that permit fees requirements are similar to fees for fire alarm systems.

Troy: Currently updating the DEB permitting policy. Going by the exception in the building code for systems 30v or less. They don't need a permit unless they penetrate fire-rated construction, or are being run in plenums.

Tread: Since the IBEC system will be tied into the fire alarm system, he thinks a permit should be required.

Jeff: ROM study or other pre-construction estimate analysis?

Dana: ROM studies cost a few thousand or less.

Jeff: Is it a cost that is separately paid, or is it integrated in the overall design cost?

Dana: Information is all gathered first, but there still can't get be an exact cost estimate. An iBwave design system is typically used. It can be tied in with the overall design price in contract, or it can be individually priced. It can also be integrated with electricians. BDA installation can be part of the electrician's or fire alarm installer's responsibility. Later, when actual data comes in after the build, the cost can change.

Jeff: Are there any other pre-installation fees – FCC, local authority?

Dana: She doesn't think so. There's a small permitting fee from the local jurisdiction, but that's it. She will double check to make sure there are no other costs.

Jeff: There is also the cost of annual and periodic (5 yr) tests, and possible system upgrades or modification costs. Is there anything else?

Dana: There's usually a maintenance agreement with an inspector for a fee. They are usually set for 5 years and can cost up to about \$5k for larger buildings. Hospitals are typically more complicated. It can also be setup with extra costs for different things, like emergency off-hours contacts, for example.

Jeff: Could these be stand-alone, or also tied in with the fire alarm system?

Dana: They are usually included in one agreement. They can stand alone if there is not a separate fire alarm system.

Steve: How about cost of the system itself?

Jeff: Yes, design and installation is a cost that will be included in the list.

Dana: She looked at NFPA 1225 quickly, which discusses 2 hour rated vs. standard coax (there's a big cost difference). She will look at it further.

Jeff: Is this something new in NFPA 1225 that is not in 1221? Please look and share next time.

Tread: Any metal conduit, (EMT, IMC or RMC) will be a 2 hour rating. It is more expensive than a standard UL 444 coaxial cable, but much less than a 1941 cable, which is cost-prohibitive – about \$135 per foot for a 1,000 foot reel. Cost for EMT, IMC or RMC cable costs a few dollars (\$8-\$10) per foot.

Troy: Did Tread say that putting a coax in conduit would provide a 2 hour rating?

Tread: Yes. EMT, IMC or RMC will give the equivalent of a 2 hour rating. He will get the information to support it.

Troy: The 2 hour rated cable is only required for riser, but not horizontal cabling? He will double check. It could be in the 1221 or 1225. He thinks it is consistent with the building rating.

Cindy: Does conduit keep the radiating cable from working the way it's supposed to?

Andrew: If referring to "leaky cable", that is an older technology. Now, we see systems where the cable goes from an amplifier to a repeater device in the building.

3) Other

Jeff: Jamie asked earlier (in the chat box) if the SFPC covers maintenance. Yes, section 510 of the SFPC does cover maintenance. 510.2 states that the owner must provide space for and access to the system. The locality is responsible for testing and associated upgrades, at no cost to the owner (unless owner doesn't provide access).

Jeff: provided a link in the chat box to a NIST program of public safety communications, which may point to new technology that could be emerging; cellular and LTE. These should be discussed, and latest technology should be identified and included if it will be the new industry standard.

Troy: He did read an article recently from the Safer Buildings Coalition that says that the 2022 edition of NFPA 1225 discussed 'standards for emergency service communications', which used to be 'emergency communications enhancement systems'. It says that land mobile radio systems are being used less, and cellular and LTE systems are being used more. It also references the future of PS communications and FirstNet.

Jeff: Yes, any new technologies – bring to the table.

4) Assignments and Next Steps

Jeff: between now and the next meeting, collect data on:

- **Cost**: Steve & Troy
- **NFPA 1221 & 1225, UL 2524 and FCC 47 CFR part 90.219**: Dana
- **Other States/localities**: (requirements, funding, etc.)
 - Jay will find out about NC and MD and what's new.
 - Andrew will look for national data about who does what where.
- **NIST**: DHCD will contact a public service coordinator

5) Next Meeting

Jeff: Asked the group to get all data collected and remitted to DHCD in a timely fashion, so it can get on the agenda and be sent out to the group to review prior to next meeting. A Doodle poll will be sent to the group members to determine when the best date is for the next meeting. Jeff thinks maybe the week of Jan 17th (although the 17th is holiday). He wished a happy and healthy new year to all.