

Residential Dock Electrical Safety Sub-Workgroup

January 28, 2020

Virginia Housing Center – 4224 Cox Road, Glen Allen, VA 23060

Attendees:

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|---------------------------|--------------------------------|
| Haywood Kines | I.A.E.I. |
| Allen Turner | I.A.E.I. |
| David Humphrey | I.A.E.I. |
| Neil Harrington | SML Marine Fire Rescue |
| David Trimble | Smith Mountain Lake |
| Randy Holloway (remote) | Smith Mountain Lake |
| John Lane | Smith Mountain Lake |
| Florin Moldovan | VBCOA - Spotsylvania County |
| Jim Erler | Stakeholder - Bedford County |
| Casey Littlefield | Goochland County |
| Guy Tomberlin | Underwriters Laboratory |
| Greg Cade | NFPA |
| Robby Dawson | NFPA |
| Jeff Sargent | NFPA |
| Fred Reyes (remote) | NFPA |
| Bryan Holland | NEMA |
| Kevin Arnold (remote) | EATON |
| Gary Loftis (remote) | Loftis Engineering |
| Larry Jackson | APCO |
| George Felts | Southside Electric Cooperative |
| Cindy Davis | DHCD |
| Jeff Brown | DHCD |
| Richard Potts | DHCD |
| Thomas King | DHCD |
| Paul Messplay | DHCD |
| Brian Hildebrand (remote) | DHCD |

Welcome/Introductions

Ms. Davis opened the floor for introductions and for everyone in attendance to identify their representations. She summarized the issues discussed previous: stray voltage, provisions for grounding and alternative systems that could address this issue.

Presentation from Bryan Holland, NEMA:

Mr. Holland gave a presentation and summarized some information available about addressing concerns that arise from various grounding systems. One such document balances the costs and benefits of grounding and bonding, but that it increases risks from stray voltage and electric shock.

Mr. Holland did research with several national code representatives, including studies and standards from UL 943, and officials with Florida Power and Light. He emphasized from his conversations with various national and state-level officials that whatever result we produce from this sub-workgroup should be a wholesale improvement of the aspects of the code and not include weakening or trade off measures.

Mr. Holland recommended several provisions from the 2020 NEC to improve the protections around grounding and stray voltage. He recommended ground detection devices on the neutral and surge protection devices. Further, he recommended bringing Articles 555 and from the 2020 NEC forward to increase protection at residential docks. He also had some other items that could be part of an alternate proposal to improve safety in the water around docks.

Mr. Harrington summarized the goal of the proposal and the limited scope of the dock proposal and the residents of Smith Mountain Lake not seeking to expand the proposal to everything Mr. Holland brought up.

Mr. Kines summarized an issue with the proposal and how a fault could still travel to the dock if the equipment feeder was removed. Mr. Erler stated that the GFCI would resolve that issue. Mr. Holland explained the path the fault would take to electrify all magnetic parts of the equipment if that feeder ground was removed.

Mr. Kines asked how far the house panel is from the dock panel. Mr. Erler estimated about 100 feet. Mr. Kines speculated that they are trying to use 100 feet of earth to block the path of the current. Mr. Felts summarized the current practice that Southside Electric has been conducting to investigating the concerns of residents at Smith Mountain Lake. Mr. Jackson agreed and further commented that due to the amount of mica in the soil, the best ground path is always going to be around lakes or bodies of water.

Presentation from Mr. Erler:

Mr. Erler began his presentation. He summarized the various problems with the NEMA presentation and recommendations and identified what other best practices there are around the world to address electric shock drowning. Mr. Humphrey pointed out again that the whole scope of different equipment that is utilized internationally makes it completely impossible to compare our system to theirs. Also, that this proposal only seeks to address a single source of stray voltage, that it still comes from other residences, boats and the utility.

Discussion:

Mr. Holland emphasized the need for this to be moved to the national code making process where more expertise, researching and testing is available.

Mr. Arnold offered his role on the national code making panel with jurisdiction over the relevant sections of the NEC to bring forth this proposal and all the research from the residents of Smith Mountain Lake to the 2023 discussion. Mr. Holland pointed out how the NEC code operates and that what is common practice at residential docks at Smith Mountain Lake exceeds the code and proposals to codify and modify those practices create conflicts in what is supposed to be a minimum code.

Mr. Moldovan brought up the possibility that the experts in the room instead of picking holes in the proposal could come together to craft a passable code change that meets code.

Ms. Davis closed out the first half of the meeting by inviting the participants to help craft a proposal that can be submitted as a consensus item and that no matter what happens, the proposals developed here will go through the rest of the workgroup process. Mr. Humphrey offered to contact colleagues in Canada who work on the Electrical Safety Authority in that country and if they have established protocols for residential docks.

Mr. Holloway brought up a list of best practices he has posted on his website (Smith Mountain Lake Fire and Marine Rescue) and offered it up for discussion and critique. Several people reacted favorably including representatives from NFPA/NEMA. Mr. Holland offered that the list be modified to state that “work being conducted to improve the electrical safety should be performed by a licensed and insured electrician.” Mr. Humphrey offered the aid of IAEI in education to the public and professionals in this area.

Mr. Holland brought up the ESFi.org website and the Boat and Marina Safety section which has numerous resources for educational purposes and best practices. Mr. Holland indicated that Jeff Sargent, on the conference line, is a staff liaison for submittal from the public to NFPA.

Mr. Holland drew a simple diagram of the issue with the proposal to remove the green wire for residential docks. He explained the various paths that the electric current could take to return to the source and that removing the one path Mr. Erler is proposing, it still leaves infinite other paths which could cause the lowest impedance shock path leading to shock drowning.

Mr. Tomberlin spoke to the differences between legislative action and regulation and the fears that this conversation is getting a bit off topic. He argued in favor of this code making process and the expertise in the room.

Mr. Harrington asked how the residents can engage a testing organization to provide information and a report that would be acceptable to NFPA/NEC. Mr. Dawson said that the NFPA research foundation has that ability and stated that it would not be quick but could be done. Mr. Humphrey asked the group if they could at least agree that the 2020 NEC provided improvements in safety for residential docks and marinas for ground fault protections.

Ms. Davis summarized Mr. Kines proposal and the suggestions Mr. Holland made in his presentation. She asked if any kind of consensus proposal could be crafted to bring this discussion to a head. Mr. Erler indicated that none of those proposals would address stray current in the water and that the only solution that's acceptable to them is to permit removing the equipment grounding conductor.

Mr. Sargent explained the code submission process for changes to the NEC and how codes are correlated and judged to be acceptable submissions and who will review the submissions for integration into the code.

Closing:

Ms. Davis summarized the next steps. The April 15th meeting will be the next meeting where the proposals are discussed. This meeting is a full workgroup meeting. If it still needs more time, there will be an additional full workgroup meeting in May. We will continue to keep our eyes out for further information and anything that could potentially shed more light on this discussion from research into what works in Europe to recommendations from the NFPA to get the proposal through.