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Date: September 25, 2023
To: Electrical Inspectors and Licensed Trades
From: Division of Fire Safety
Subject: Flood Update to Resource Page

Larger electrical service and distribution equipment remains in short supply and much of it is having to be ordered with delivery dates from 6 months to 2 years out. This is being taken into consideration and is allowing for the temporary re-energizing of existing electrical equipment with preventative cleaning, testing and maintenance being performed.

The effects of flood water on electrical equipment may not be immediate, however they are inevitable. Flood waters are loaded with many contaminants, from silt and sand to sewage to fuel oils. These all have negative impacts upon electrical equipment. Even after the drying and cleaning process, if proper care hasn't been taken to properly clean out these contaminants and preserve metals, rusting and corrosion will form in and on electrical equipment. Electrical contact points will weaken decreasing reliability and increasing heating. Circuit breakers will corrode internally and fail to operate properly when needed or simply fail at an inopportune time. Submerged utility power meters may stop responding to their utilities or fail to allow power to the electrical panels.

Electricians should evaluate, closely, submerged cables and conductors and determine if branch circuit wiring will need to be replaced. Cloth covered or "snakeskin" cable, or cables with reduced Equipment Grounding Conductor or no EGC will need to be replaced. If bare and insulated conductors show excessive corrosion and fail a meg-ohm-meter test, they will need to be replaced, at a minimum to the unaffected area. All flooded electrical receptacles and light fixtures will need to be replaced. These items, with their smaller thinner contact points are most likely to overheat and fail as they have proven to do so in the past.

As we start the rebuilding process a few things have become clear. Electrical equipment that has been flooded for the second and third time is reaching its expiration date if it hasn't already. Wire to lug and bolted connections have corroded to a point at which they cannot be serviced or reconditioned. Some "plated" or coated bus bars now have the plating falling off, leaving the bare aluminum to corrode even further. This will compromise contact points, increasing the potential for failure and overheating. Dissimilar metals, steel and aluminum without corrosion inhibitors are now deteriorating to a point where replacement is necessary.

Several municipalities have adopted language, this can be found in their "Flood Zoning Regulations", regarding the building and replacement of electrical infrastructure. The language adopted for non-conforming structures is derived from FEMA 200 and 312. The Vt Division of



Fire Safety will be looking at the use this guidance to prevent further damage to property and endanger people. The guidance states any new or relocated electrical equipment needs to be raised to above the Defined Flood Elevation (DFE) in the Flood Zoned Areas. Any “substantial reconstruction” may also require raising equipment to above the DFE. Any electrical equipment that can be serviced, cleaned, breakers or fuses replaced, preserved and proven safe with meg-ohm metering to remain in service may be permitted to remain so long as all governing bodies agree with this decision. This may only be a temporary situation until equipment and materials can be obtained and planning or scheduling will allow.

Green Mountain Power and several other Vt utilities have lost large numbers of “smart meters” during the flood. After 8 weeks later they are still replacing non-responding meters throughout Barre and Montpelier. These were mostly meters installed in basements, which once was common practice but now is being re-considered. If electrical metering equipment is being replaced, consideration should be given to relocating out of basements, in Flood Zoned Areas, and above the Determined Flood Elevation (DFE) where practical. The Authority Having Jurisdiction (AHJ) will determine or assist in determining, if metering equipment need to be replaced and where it should be relocated to, based on Municipal “Flood Zoning Regulations”, the electrical utility and feasibility.

Special consideration needs to be given to the replacement and relocation of electrical distribution equipment including electrical panels, overcurrent devices and disconnects. Where electrical panels have been flooded and are replaced, alternative locations need to be considered and planned for. If cleaning of panelboards and load centers with the replacement of breakers are offered this shall be considered a temporary re-energizing with planning to relocate in the future. This will be determined by the AHJ, if needed.

With the shortage of electricians, it is tempting to utilize the first person that returns a call. The Division of Fire Safety strongly encourages property owners to check references, generate and compare specific scopes of work. We also encourage soliciting 3 bid proposals, if possible, when work is being quoted. Plumbing and electrical work being done in a State defined “Public Building” requires licensed professionals. A list of licensed professionals can be found in this website.

Reminders:

*AFCI has been exempted for the extension of branch circuits to relocated flooded panels until 1/1/2024.

*Flood related repairs should utilize the “Flood Resource” EWN to exempt fees.

The Division of Fire Safety would like to acknowledge the Electricians and the other trade professionals for stepping up during the flood recovery process. You all have worked long days, weeks, and months now, to help friends, neighbors, and people affected by the disaster. We have seen so many of you working, in less than desirable conditions, to restore power and some sense of normalcy to our communities. Most of our trade professionals already had their summer work scheduled planned but they found a way to re-schedule and take on more than what was planned on, to help their communities. Our construction community is truly something to admire and appreciate during this time of need. We are all in this together, we still have a long way to go, we will get through it together.

Stay “Strong” everyone.

The State of Vermont and our communities all Thank You for your efforts.