

Water and electricity don't mix ... right?

By Richard van Leeuwen P Eng (electrical)

I have often been asked to examine electrical equipment that has been exposed to water. Obviously, it's not a good idea to make equipment wet. All sorts of things can go wrong. Electricity will pass through water if there are impurities in it (and there usually are). So if you are standing in water and touch something electrically "hot," you'll get a shock and risk injury or even death, depending on the circumstances.

Corrosion is accelerated when water is present, and in some cases an electrical connection can be compromised. In electronic equipment, short circuits can occur which can damage some of the sensitive circuitry. In medium- or high-voltage equipment, arcing and short circuiting can cause arcing damage and trip protective devices such as circuit breakers or fuses.

If you're unlucky and in control of some electrical equipment that's wet, I would suggest disconnecting the equipment from its electrical power (or at least turning it off); if it has a battery, disconnecting or removing the battery; drying the equipment; and, when you're confident it's dry, trying the equipment to see if it works.

But what if the electrical or electronic equipment is not visibly damaged and then dried? Will it still work? It's relatively easy to find out. Just try it. But will the device fail later? Many people think so, however, I don't. It's like saying that one almost fell off a cliff, therefore, one is at an increased risk of falling off a cliff later. I'm not aware of any credible or scientific body of knowledge saying electrical equipment is at risk at a later date if it got wet and then was dried.

I have worked for an industry that used many 600-volt motors that routinely experienced condensation when they were de-energized during the annual winter shutdown. The plant electricians would test the insulation, and, if the motors were still wet, they would connect them to low-voltage electrical current to heat them up and dry them out. Once the motors were dry, the electricians would run them and they would last for their normal lives. BC Hydro distributes electricity and has thousands, perhaps millions of kilometres of electrically energized conductors outside and in the rain. They may actually depend on the rain to clean the insulators!

It's my understanding that many insurance policies state that the insurer will not accept a claim if there is no evidence of damage, so when I examine electrical equipment that may have been exposed to water, I look for and record any electrical damage. But if I can't find any, and the equipment still works, I believe it's neither damaged nor jeopardized.

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