



How

DRAINING THE SWAMP

can reduce the impact of “surges” as thunder storms approach

Over the many years of working with electric utilities and their customers, we often come across unique situations where the customer keeps experiencing transient surge damage to their business. This article is intended to provide you with additional insight and a couple of check-list items that may prove beneficial in reducing the risk of surge damage to your home or business.

So ... what do we mean by “draining the swamp”? We are talking about the area under or immediately next to your outside electric meter and ground rods.

“There are so many things that you learn through actual field experience (versus school books),” said Peter Jackson of KENICK, Inc. Our learning about “the swamp” happened during several visits to utility client homes and facilities.

Here is the scenario that happens when a customer home or business has a “swampy ground”. It’s a clear sunshiny day and dark

clouds appear over the horizon. The distant rumble of thunder starts getting closer and closer (indicating that you should stop your outdoor activities and head indoors...).

Allow us to pause for a moment to share a bit of information about lightning. As thunder storms approach, electrical discharges (i.e. lightning) from within the storm get closer to trees and... power lines!!

Keeping in mind that lightning is a bit lazy and likes to pick the easiest path to ground, quite often electrical utility distribution lines receive the brunt of the cloud discharge and the race

is on... as the lightning bolt travels along the utility distribution line seeking a simple way to dissipate into the earth.

So here is where “the swamp” comes in.

Electric utilities have lightning protectors installed up and down distribution lines. Each lightning protector is grounded to earth at the pole where it was mounted. Quite often they discharge into “dry” earth.

If your home or business has a “wet” or “swampy” ground (resulting in a lower resistance than distribution arrester grounds), the lightning (being lazy) will see this lower resistance and a large amount of transient energy will travel to the swampy ground.

Quite often, as it discharges into earth/ground,

some of the transient surge energy can enter your home or business and wreak havoc with electrical devices as it dissipates into earth ground.

As the storm approaches and rain arrives, in a few minutes, the distribution lightning arrester grounds will also become “wet” so the easy path to your home/business will become less convenient for the lightning bolt. However, the damage is already done.

In many cases, you won’t even know that the event happened, in other cases you may see a blue flash or cracking sound (not good).

Here are a few case studies that will help you better understand the need to “drain the swamp”:

COMMERCIAL BUSINESS: TRANSPORTATION INDUSTRY

Background:

Customer has experienced numerous damage events to the computer server and other equipment within the facility.

Site Findings:

Large parking lot with lighting that is supplied by circuit breakers inside the main electrical circuit breaker panel... right next to main computer server for the business (yes, seriously).

The electric meter is located on the other side of the wall where the circuit breaker panel is located (less than 2 feet between). The adjoining room has a large ice machine with a drain bin that drains through the wall and directly onto the electrical grounding system. For some reason that customer had also dug a trench for the melted ice water to run off which covered both ground rods with “swamp”!

Recommended Solutions:

1. Redirect ice melt water runoff away from the facility ground (Cost: \$22.00 for PVC pipe/fittings/ glue.)
2. Move electrical feed from parking lot lights either to a utility provided lighting system (separate transformer) or to a mechanic’s shed power feed.
3. Install surge protection at the electrical main and at the computer server.
4. Install surge protection at electrical feed to other buildings on the property.
5. Suggested that they move the computer server away from the electrical main.

End Result:

- Customer implemented all solutions presented.
- No more damage issues.

RESIDENTIAL: SIX UNIT CONDOMINIUM

Background:

Condominium is approximately 5 years old. Located adjacent to large body of water. First few years were uneventful but have experienced 4 damage events within the past 6 months.

Site Findings:

Each unit is served by a shared electrical feed/ underground service. The same transformer also feeds circuits running from house meter down to boat docks.

Each condominium is located on the 2nd and 3rd floors with parking on first floor. The electrical main and electric meters are located within an outdoor enclosure adjacent to parking area on level 1.

Right next to the electric meters is an outdoor faucet for watering plants. The faucet has a slow stream (no longer a drip) of water that collects between the garage entrance and sidewalk, which is shared also by the electrical grounds for each unit and house electric meters.

The ground is saturated to the point that excess water is traveling to the other side of the sidewalk via expansion joints cut into the concrete. Based upon the “greenness” of the

grass, it appears that this supply of moisture has been occurring for several months.

Recommended Solutions:

6. Replace the water faucet valve. Better yet, move the outdoor faucet away from the electric meter enclosures and grounding system for the building.
7. Install low profile meter base surge protector at each residence meter and at house meter for property.
8. Install surge protection (hard-wire) at electrical panel (other side of building) providing power to the dock area.
9. Consider installation of surge protection at each dock panel (help protect both boats connected and opportunity for back-feed).

End Result:

- Customer replaced exterior water faucet.
- Customer did not move faucet.
- Two of the four units had low profile meter base surge protector installed.
- House meter had low profile meter base surge protector installed.
- One hard-wire surge protector installed at house panel power to sub-panel serving dock area.

IN SUMMARY:

Where some issues can require many days of analysis, simply draining the swamp can significantly reduce the impact of transient surges as storms rumble their way through the area.

Questions?

Please contact Peter Jackson if you have questions about this article or a particular issue that you need help with.

Zap1@kenick.com