PROTECTING CONVENIENCE STORES FROM TRANSIENT SURGE DAMAGE

The risk of transient surge damage to convenience stores is significantly higher than a typical office due to several design issues. This white paper is intended to provide the reader with information that can be used to mitigate damage and lost revenue resulting from a transient surge event.

Convenience stores are a welcome solution to customers who forgot something at the grocery stores or for those wanting to stop for a quick snack (or treat) on their way home or to their destination.

Most convenience stores are served by their electric utility at single phase 120/240 Volts. This service voltage is easy to manage and though somewhat less efficient, the costs of panels, breakers, compressors and motors is significantly less than 3-phase equipment.

Over time, many convenience stores have expanded their service levels through installation of coffee bars, pizza stations and a wide range of chilled products. We have

seen situations where electrical panels are significantly overloaded. We strongly recommend that any installation of new equipment should include securing the services of a qualified and licensed electrician who can check loads and wiring to make sure that the electrical service capacity is sufficient to support new equipment.

In what could be considered a "canopy war" to see who can create the highest and largest canopy, the design of convenience store structures and tall canopy sizes can significantly increase the risk of a lightning striking the canopy and then traveling through metal and communication/wiring in search of "earth ground".

We offer the following recommendations to mitigate the risk of transient surge damage to a convenience store.

- Consult with a qualified engineer to make sure that the building and canopy structures are properly grounded according to the National Electric Code (NEC). (Many electricians have been known to try to solve problems by driving additional ground rods at a facility. Quite often, this makes matters worse rather than fix the problem.)
- Install a hard-wire surge protector on the load side of the main electrical feed to the facility.
- Install an additional hard-wire surge protector on all panels serving canopy lights and gas pumps.
- Locate the panel that provides power to outdoor signs and install a small surge protector on each circuit breaker providing power to these lights.
- Reach out to the manufacturer of gas pump controls (Gilbarco/ Veeder Root) for their recommendations or availability of surge protection kits for wiring between the gas pumps and main building. We recommend working with the pump manufacturer due to the need to carefully select surge protectors that can be safely installed on their equipment.
- Purchase true "on-line" (double conversion) battery back-ups for critical loads including gas pump controls/card readers, cash registers and any other revenue producing "microprocessor based" equipment. (Consider one large versus several small units.)
- Secure quality surge protection power strips that will plug into existing or new battery back-ups.
- Verify that each compressor (coolers/ HVAC) has "time delay upon restart" protection modules installed and operational. These protection devices will keep the compressor from starting at high refrigerant pressure after a momentary power interruption (blink). Typical delay times are 3 to 5 minutes after power is restored.
- Visually inspect the area around the utility electric meter to make sure that the soil is typically "dry". A damp area around the ground rod can actually attract transient surge energy as storms approach.

Careful review of existing infrastructure and installation of protective devices noted above can go far in mitigating opportunities for transient surge events to interrupt operation of a convenience store.

ABOUT KENICK, INC.

KENICK, Inc. has been providing surge protection products and solutions to the electric utility industry for over 32 years. Their facility includes a state-of-the-art research laboratory, allowing them to test surge protection products to see how they respond to small, medium, large and “oh my gosh… what was that?!” transient surge events.

ABOUT THE AUTHOR

Peter Jackson has been responding to the needs of electric utility clients and their customers for over 25 years. His knowledge and expertise in mitigating transient surge damage events has been gained through hundreds of field reviews and their successful outcomes.

Questions?

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

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