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Ingenuity for life

TPS3 Design Guide

Water Treatment Plant Surge Protection Solutions

usa.siemens.com/surge

In today's electronic world, electrical systems for the home or business just aren't complete unless they incorporate surge protection. The most effective way to defend and safeguard this environment against damaging surges is by hardwiring surge protective devices (SPDs) throughout the electrical distribution system.

Ideally, every electrical panel should be surge protected, however, this may not be practical or feasible. Proven surge protection practices do not have to be complicated or costly. All that is required to effectively surge protect your facility is to answer the following questions:

1. Where should hard wired SPDs be installed on the electrical system?
2. What size and type SPD should be used?

Government studies suggest that the most efficient way to surge protect an electrical system is by applying hardwired surge protective devices at the main incoming electrical and communications services. Additional hardwired suppressors were recommended to prevent backfed surges that could bypass the primary electrical service SPD. Also, localized equipment SPDs are recommended to protect against residual and internally generated surges.

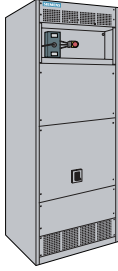
Following these practices, five common SPD electrical systems installation points can be identified. Applying surge protection at these points will maximize a facility's surge immunity. These locations can easily be remembered by using the following acronym, "The best surge protection installation is a S.O.L.I.D. one." Where S.O.L.I.D. stands for the following:

- S** Service Entrance
- O** Outside Loads Powered From Distribution Panels
- L** Lower Voltage Distribution Panels
- I** Individual Critical Equipment
- D** Data, Telephone and Coaxial Cables

The following example applies S.O.L.I.D. SPD protection to a Water Treatment Plant's electrical system. Listed on the back are SPDs with appropriately sized redundancies that we have found over the years to provide years of uninterrupted protection.

TPS3 Design Guide

Surge Protecting a Water Treatment Plant



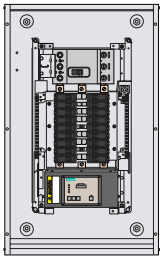
Service Entrance

Applying surge protection at the incoming electrical service “Stops Surges Before They Get In.” These types of surges contain the largest surge energy warranting 300 kA or more of surge current redundancy.



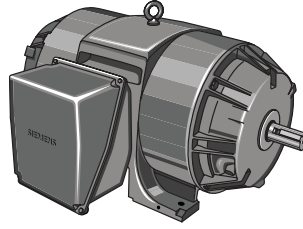
Outside Loads

SPDs should be installed at distribution panels feeding remote circular clarifiers, remote storage, etc. to prevent back feeding surges entering the main plant.



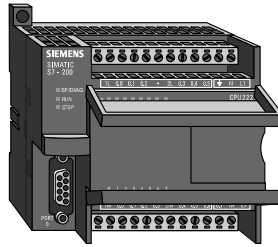
Lower Voltage Panels

If the plant is supplied with a higher system voltage (i.e. a 277/480V service), 120V panels need SPDs to condition residual surges leaving the service entrance SPD as well as any internally generated surges. Examples could be panels powering dry polymer feed systems, odor control systems, or any other panels powering sensitive electronic-rich rooms.



Individual Equipment

Even if surge protection is applied at the previous locations, redundant protection maybe warranted for sensitive, costly equipment. This may include pump and process controllers.



Data Lines

Security, fire alarm, and telephone systems using copper communications lines need protection especially for telemetry and SCADA circuits running between locations across the plant.

Siemens TPS3 SOLID Solutions

Service Entrance

Internal SPD	External SPD
TPS30630	TPS31230
Increased Redundancy	
TPS3L630	TPS3L1230

Outside Loads

Internal SPD	External SPD
TPS30520	TPS31220
Increased Redundancy	
TPS3L520	TPS3L1220

Lower Voltage Panels

Internal SPD	External SPD
TPS30215	TPS31115
Increased Redundancy	
TPS3L215	

Individual Equipment

External SPD	
TPS31110	TPS30910

Data Lines

External SPD	
TPS30350	



TPS3 06



TPS3 12



TPS3 05



TPS3 02



TPS3 11



TPS3 09



TPS3 03

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