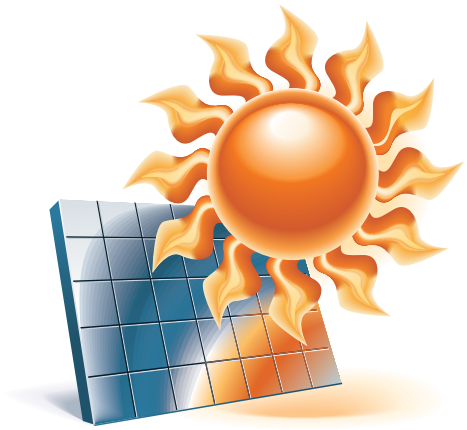
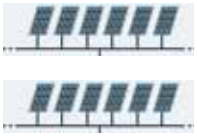
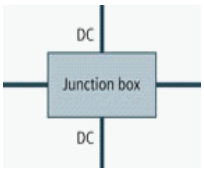
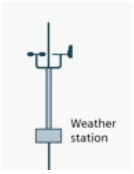
SOLAR FARM
design guide



S O L I D







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 you need to do is address the following:

1- Where should hardwired SPDs be installed on the electrical system?

2- What size and type SPD should be used?

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.

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, 5 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:

Service Entrance
Outside loads powered from distribution panels
Lower voltage distribution panels
Individual critical equipment
Data, telephone, and coaxial cables

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

Surge Protecting a SOLAR FARM

APT design guide

APT SOLID Solutions

Service Entrance

External SPD

TEXAS30E1

Increased Redundancy

TEXAS45E1

External - 10 Mode

TEXAL30E1

Increased Redundancy

TEXAL45E1

Outside Loads

External SPD

TEXCS104

External SPD

SPDEE DC

Lower Voltage Panels

External SPD

TEXCS104

External SPD

SPDEE DC

Individual Equipment

External SPD

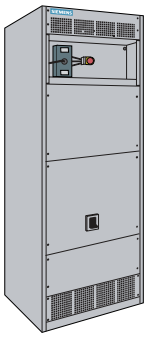
TEXCS104

External SPD

SPDEE DC

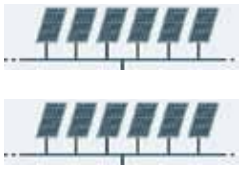
Data Lines

APT DIN RAIL



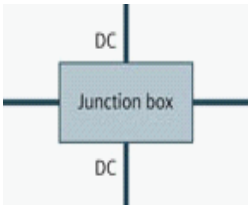
Service Entrance

Applying surge protection at the main utility electrical service interconnects "Stops Surges Before They Get In" to the photovoltaic (PV) modules or DC-to-AC converters.



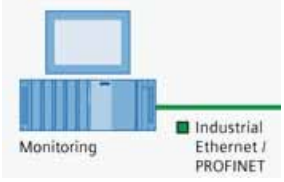
Outside Loads

SPDs should be installed at distribution panels powered from PV panels to prevent back feeding surges entering the main service interconnect.



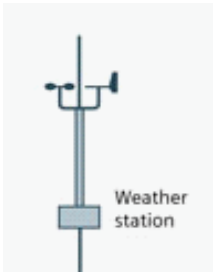
Lower Voltage Panels

This may require surge protection to be installed within the PV combiner box. APT manufactures surge protective devices for AC and DC service configurations.



Individual Equipment

If surge protection is applied at the previous locations, redundant protection may be warranted for sensitive, costly equipment. This may include PV controllers, power monitors, etc.



Data Lines

Security, fire alarm, and telephone systems using copper communications lines need protection especially for communication circuits including weather or seismic stations.

Advanced Protection Technologies

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