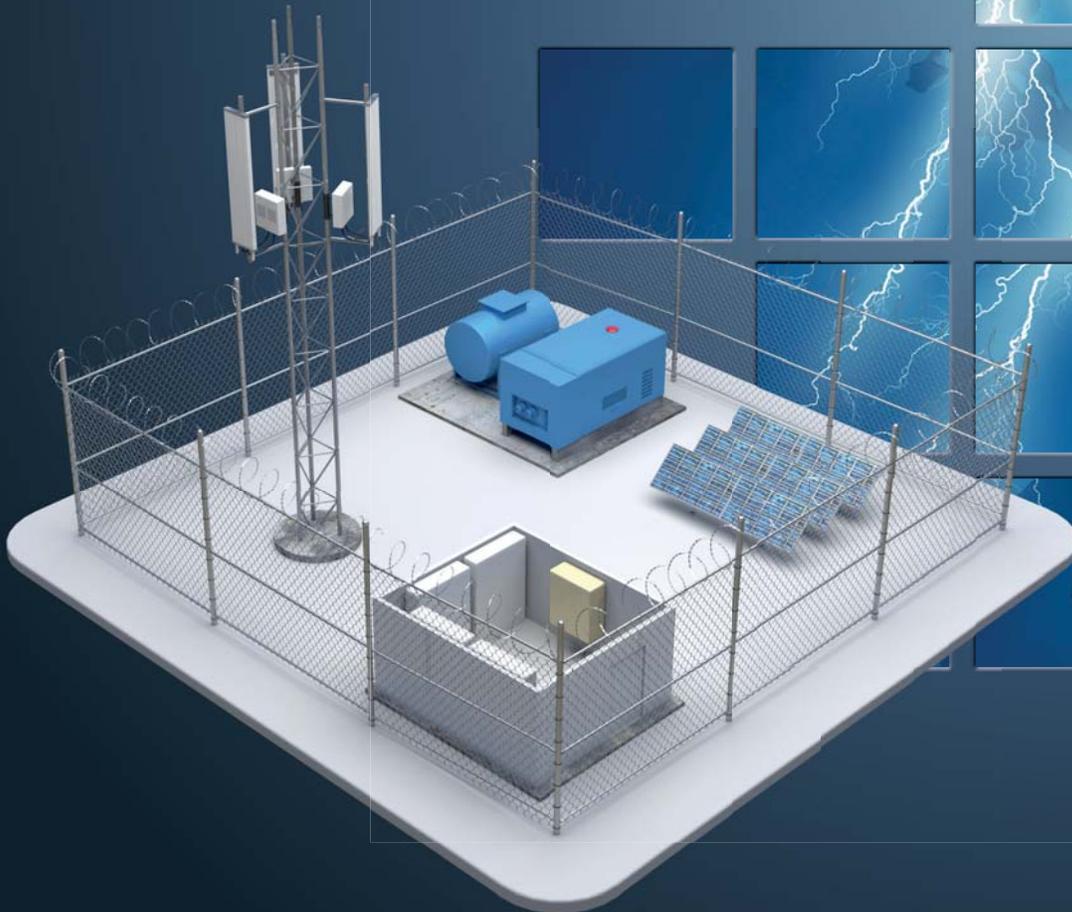




CITEL

■■■ Reliability in Surge Protection ■■■

Surge Protection for Power generation



CITEL, the global solutions provider



Since 1937, Citel has been an innovator in the field of Surge Protection. Today, Citel is a global leader in the development of reliable and adapted Surge Mitigation Solutions for critical applications.

- Over 1 Billion Lines Protected
- Local support in over 200 countries
- High Current R&D Laboratories at your disposal

Citel is unique as a manufacturer of Surge Protective Components (SPC's), Surge Protective Devices (SPD's) and coordinated protection systems.



THREAT

\$26B in losses due to Power Surges

Today's increased reliance on very sensitive electronics and processes make surge protection an important discussion topic in order to avoid catastrophic business losses. The Insurance Institute for Business & Home Safety study found that \$26 billion dollars was lost due to non-lightning power surges. In addition, there are about 25 million lightning strikes in the US each year that cause between \$650M to \$1B in losses according to the Insurance Information Institute, State Farm©.

1. Direct Strike



2. Earth Potential rise



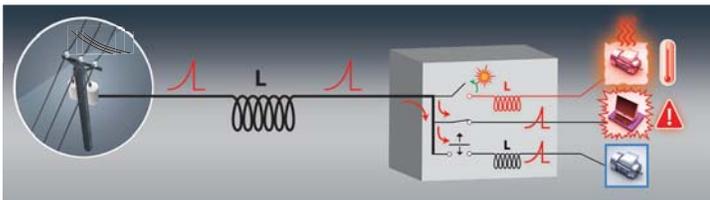
3. Strike on overhead lines



4. Coupling



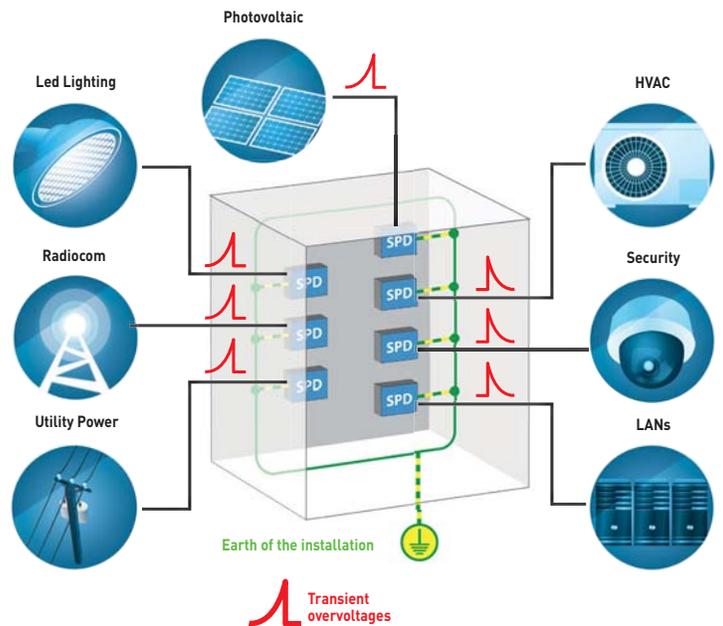
5. Switching



SOLUTION

Global Surge Mitigation Concept

Our philosophy is simple – determine your risk and evaluate every line (power or signal) for vulnerabilities. We call this the “box” concept. It works equally well for a single piece of equipment or an entire facility. Once you have determined your “boxes”, it is simple to develop a coordinated protection scheme to eliminate all threats from lightning and switching surges.



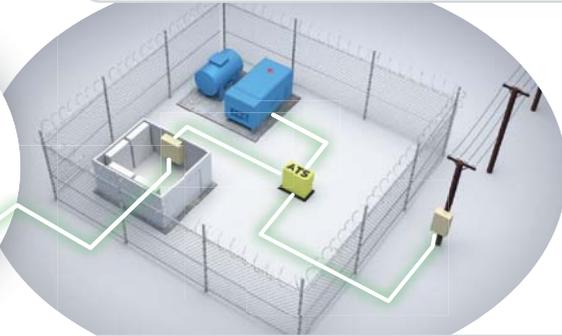
Transient overvoltages

CITEL provides a wide range of surge protectors adapted to every network: **AC power, DC power, Telecom, Data and Coaxial**.

COMMON GENERATOR SET APPLICATIONS

As the technology for power generation systems becomes more sophisticated, the risk of destruction caused by lightning strikes and power line disturbances become more evident. Mission critical power generation systems must deploy a coordinated system of surge protective devices (SPD) to assure continuous operation.

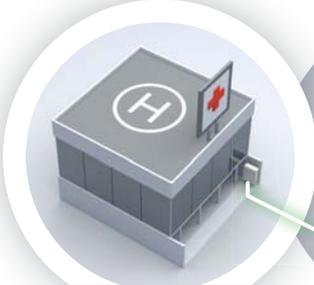
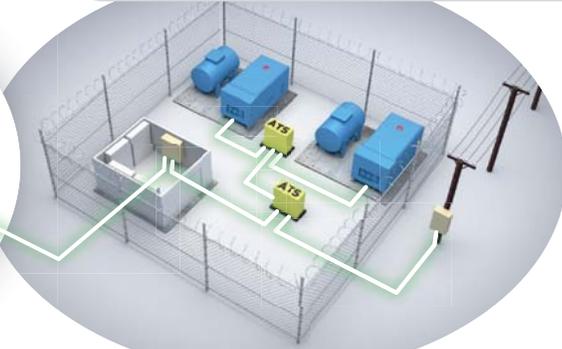
Single emergency backup power system



Telecom

- Connected to the Utility Grid
- Main threats :
 - Utility Connection
 - Direct strike to communications tower
 - Close by strike to ground

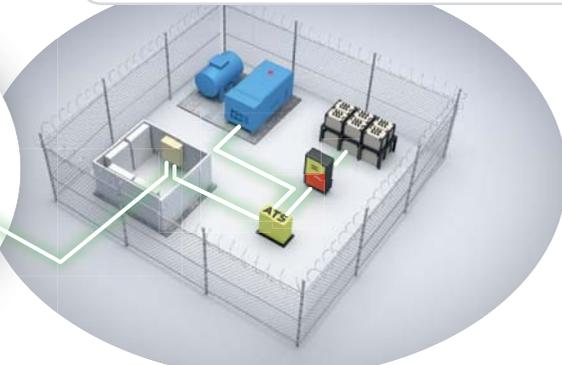
Dual emergency backup power system



Hospital

- Remote Power System.
- Connected to the Utility Grid
- Main threats :
 - Utility Connection
 - Direct strike to the building
 - Close by strike to ground

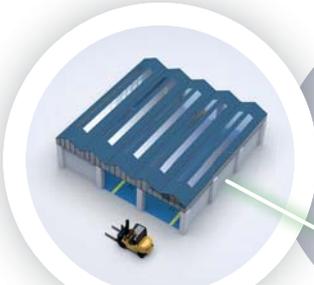
Remote power system with storage



Water waste treatment

- Power System connected to Battery System
- Main threats :
 - Direct strike to installation
 - Close by strike to ground

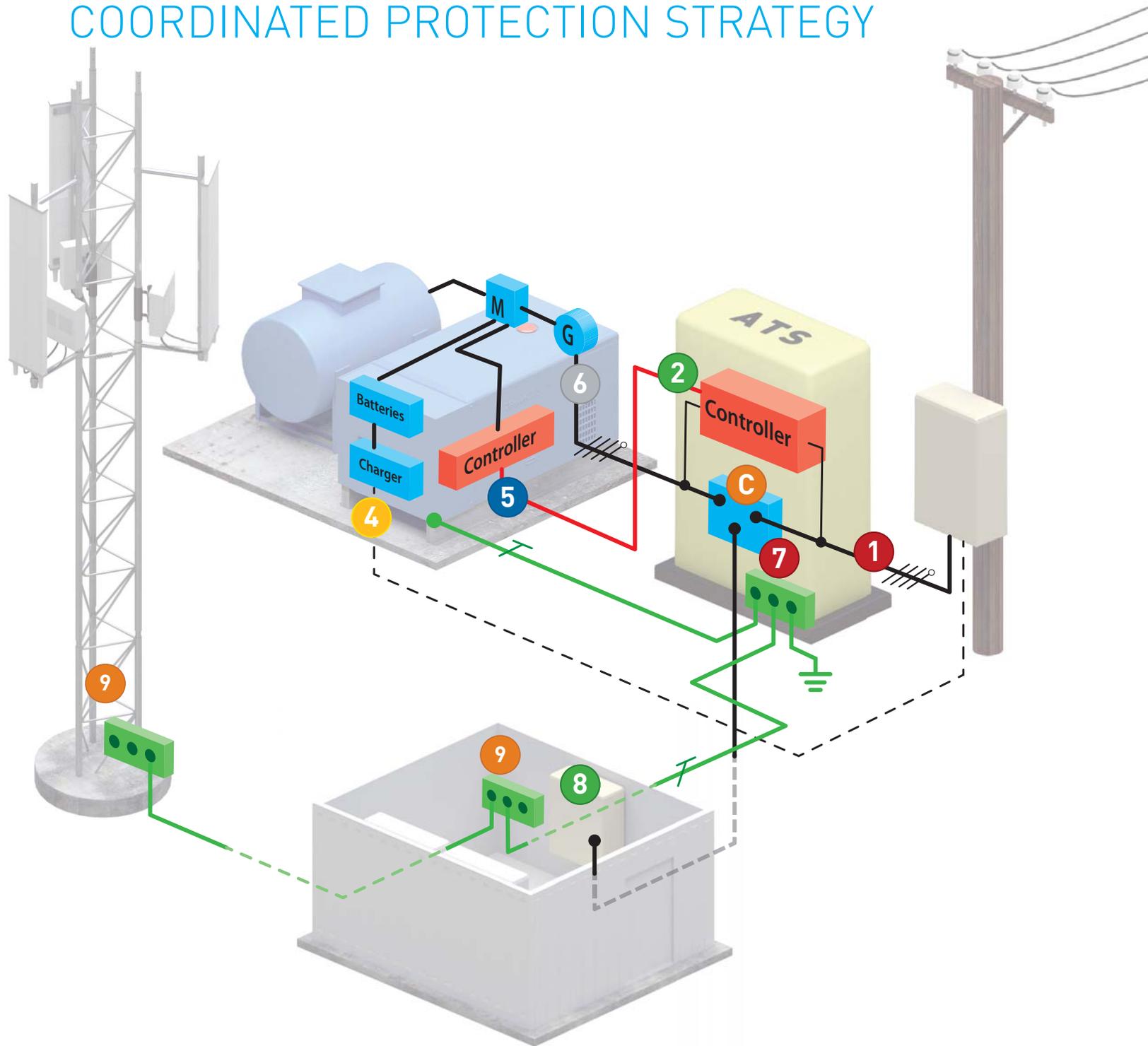
Multi sources power system with storage



Manufacturing

- Power System connected to Battery System and Solar Array.
- Main threats :
 - Internal switching
 - Utility Connection
 - Direct strike to the building
 - Close by strike to ground

COORDINATED PROTECTION STRATEGY



Location/Description/Model

ATS Line Side	1	MDS Series	Generator Line Side	6	M50
ATS Controller Relay Starter	2	DS220S-24DC	ATS Load Side	7	MS100 Series
ATS Line Side Genset	3	MS200 Series	Main Panel	8	MS100 Series
Battery Charge Controller	4	DS240S-120/G	Customer Equipment	9	Customer Specified
Genset Relay Starter	5	DS220S-24DC			

RECOMMENDED PRODUCTS (TECHNICAL CHARACTERISTICS)

MDS Series Modular AC Surge Protector



Technical data	MDS750	MDS750S	MDS750E
Protection Type	AC Power	AC Power	AC Power
Location	AS Line Side Utility	AS Line Side Utility	AS Line Side Utility
Imax (total)	750kA (8/20µs)	750kA (8/20µs)	750kA (8/20µs)
Imax (per phase)	360kA (8/20µs)	360kA (8/20µs)	360kA (8/20µs)
In (UL1449)	20kA (8/20µs)	20kA (8/20µs)	20kA (8/20µs)
Features	Replaceable SPD Modules, diagnostics, alarm, remote contacts, filtering	Replaceable SPD Modules, diagnostics, alarm, remote contacts, filtering, internal fusing	Replaceable SPD Modules, diagnostics, alarm, remote contacts, filtering, internal fusing, surge counter, disconnect switch
Approvals	UL 1449 4th Ed. Type 1 Listed / Type 2 Listed	UL 1449 4th Ed. Type 1 Listed / Type 2 Listed	UL 1449 4th Ed. Type 1 Listed / Type 2 Listed

MS Series Hardwired AC Surge Protector



Technical data	MS100	MS200
Protection Type	AC Power	AC Power
Location	ATS Load Side	AS Line Side Utility
Main Panel	ATS Line Side Genset	750kA (8/20µs)
Imax (total)	265kA (8/20µs)	440kA (8/20µs)
Imax (per phase)	132kA (8/20µs)	220kA (8/20µs)
In (UL1449)	20kA (8/20µs)	20kA (8/20µs)
Features	Diagnostics, alarm, remote contacts, surge counter	Diagnostics, alarm, remote contacts, surge counter
Approvals	UL 1449 4th Ed. Type 1 Listed	UL 1449 4th Ed. Type 1 Listed

M50 Series Hardwired, Compact AC Surge Protector



Technical data	M50	M50F
Protection Type	AC Power	AC Power
Location	Genset Line Side	Genset Line Side
Imax (total)	100kA (8/20µs)	100kA (8/20µs)
Imax (per phase)	50kA (8/20µs)	50kA (8/20µs)
In (UL1449)	20kA (8/20µs)	20kA (8/20µs)
Features	LEDs, alarm	LEDs, alarm, filtering
Approvals	UL 1449 4th Ed. Type 1 Listed	UL 1449 4th Ed. Type 2 Listed / UL 1283 Listed

DS220S Din Rail AC Surge Protector



Technical data	DS240S-120/G	DS220S-24DC
Protection Type	AC Power	DC Power
Location	Battery Charge Controller	ATS Controller Relay Starter
Genset Relay Starter	100kA (8/20µs)	100kA (8/20µs)
Imax (total)	40kA (8/20µs)	20kA (8/20µs)
Imax (per phase)	40kA (8/20µs)	20kA (8/20µs)
In (UL1449)	20kA (8/20µs)	10kA (8/20µs)
Features	Remote contacts, Replaceable SPD module	Remote contacts, Replaceable SPD module
Approvals	UL 1449 4th Ed. Type 4CA	UL 1449 4th Ed. Type 4CA

For additional applications and products contact your local CITEL sales rep.



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