What is a Lightning Arrester?
According to most definitions, a Lightning Arrester is....
A Device Used on Power Systems above 1000V to Protect other Equipment from Lightning and Switching Surges
Although Lightning Rods are devices that divert lightning surges to ground, they are simple conductive terminals that are always at ground potential and are never energized.

It is not a Lightning Rod.
Other Devices Similar to Lightning Arresters

**SPD (Surge Protective Device)** This is also a surge diverter, but generally for voltages well below 1000 volts.

**TVSS (Transient Voltage Surge Suppressor)**
Again this is also a surge diverter, but generally for voltages well below 1000 volts.
How do Lightning Arresters Protect Power Systems?

www.ArresterWorks.com
Impulse Sensitive Transformer

Typically 7200 Volts

System Without Arrester

110 or 220 Volts
When Lightning strikes the system ---- equipment is damaged and the lights go out.

Typically 7200 Volts

Transformer

110 or 220 Volts

Video Version
Typically 7200 Volts

Lightning Arrester

However on a System With an Arrester

110 or 220 Volts
What exactly does a lightning arrester do?

- It Does not Absorb the Lightning
- It Does not Stop the Lightning
- It Does Divert the Lightning to Ground
- It Does Clamp (limit) the Voltage produced by the Lightning
- It Only protects equipment electrically in parallel with it.
Ok, how does it divert lightning?
The MOV Disk is a Semiconductor that is sensitive to Voltage.

At normal Voltages the MOV disk is an insulator and will not conduct current. But at higher voltages caused by lightning it becomes a conductor.
The MOV Disk is a very fast acting electronic switch. It is an open switch to standard system AC voltages and a closed switch to lightning voltages.
By magnifying the MOV material 5000 times, Metal Oxide Grains and Dopants in the material can be discerned.

Each MOV Disk with a 35mm diameter and a 35mm height contains about 28 Billion MOV Grains.
The MOV Grains and their Junctions are the Electronic Switches that turn on and off in unison to divert the lightning around the equipment.

The Switches are at the junctions between the grains

These are voltage sensitive switches that switch on at about 3 volts

If there are 1000 junctions from top to bottom of a disk, it will have a total turn on voltage of about 3000 volts

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A lightning arrester is essentially a collection of billions of microscopic junctions of Metal Oxide Grains that turn on and off in microseconds to form a current path from the top terminal to the ground terminal of the arrester.
So there you have it. A Lightning Arrester is a device, used on power systems, that contains billions of electronic switches that divert lightning currents around sensitive equipment and saves them from damage.
For More about Lightning Arresters go to www.ArresterWorks.com

This ArresterFacts is just one of many that make up the ArresterFacts Tutorial Series on Arresters.

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Thank you for using ArresterWorks as your source of information on Arresters.

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