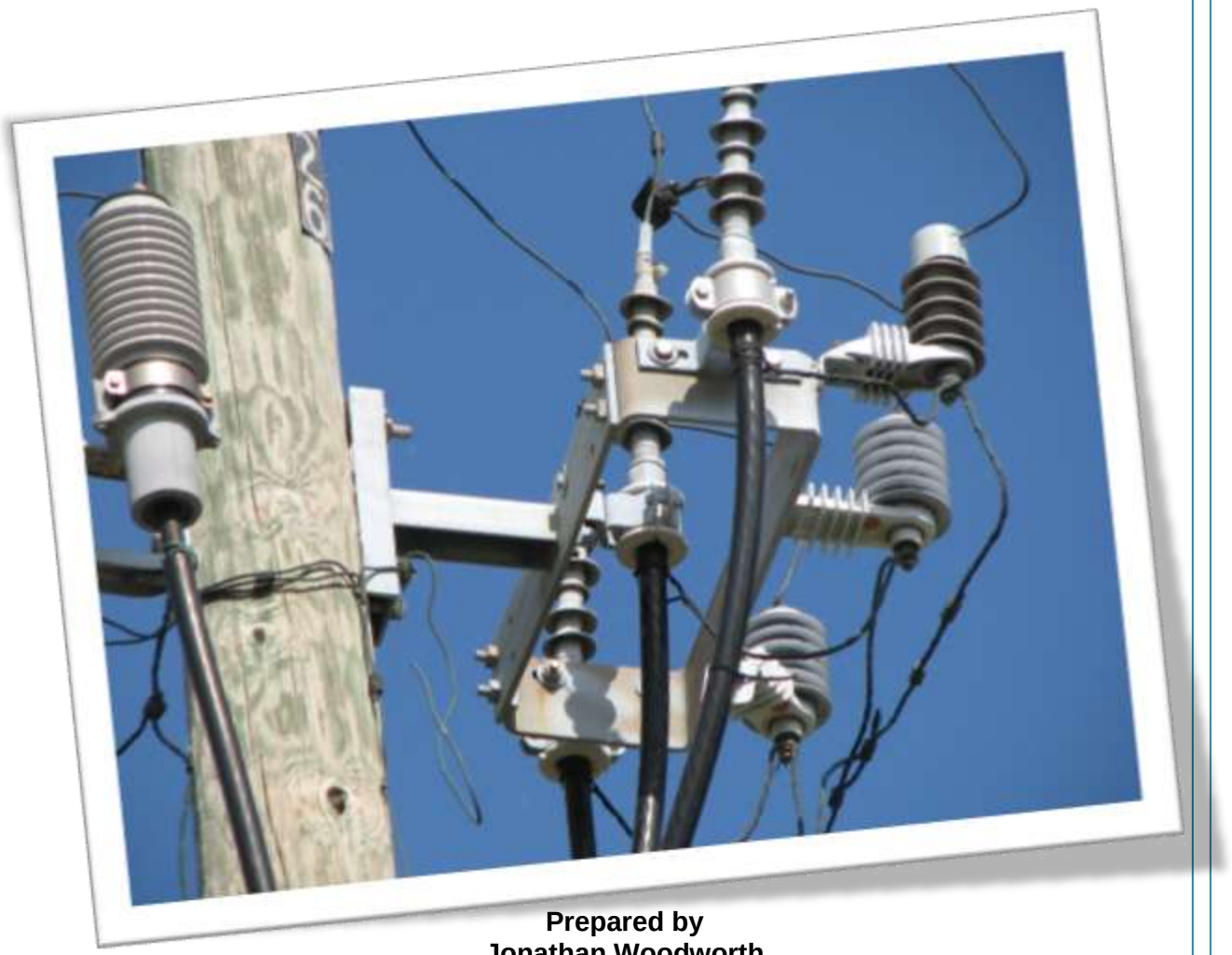
ArresterFacts 015

ArresterWorks

What is a Riser Pole Arrester



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What is a Riser Pole Arrester

Contents

Introduction

With the introduction of an arrester in ArresterFacts 007 the fundamentals of an arrester were covered. This ArresterFacts starts the series on the many different types of arresters found on systems today. The Riser Pole arrester is a very important part of power distribution worldwide and often known by different names. Terminal pole and Dip pole are two other common names in the US. In the IEC market there is no special name.

Official Definitions

The definition of discharge voltage as published in IEEE C62.11 is

Arrester, riser pole type: An arrester for pole mounting normally used to protect underground distribution cable and equipment.

There is no IEC definition for a riser pole arrester.

Note in the IEEE definition, it is a type of arrester and not a class of arrester. Also there are no special tests prescribed in the IEEE standard.

Unofficial Definitions

In the North American arrester market a riser pole arrester is defined as the best of the best distribution arresters. It is generally classified as a 10kA heavy duty arrester with discharge voltage characteristics a few percent better (lower) than a standard heavy duty arrester. In some cases, they are 20% lower in discharge voltage than the standard heavy duty arrester.

Also in the IEEE market, one might argue that any arrester that is mounted on a riser pole is a riser pole arrester. Some utilities in this market use 5kA arresters on terminal poles, and some utilities use station class arresters on the riser pole. In a sense, these are also riser pole arresters.

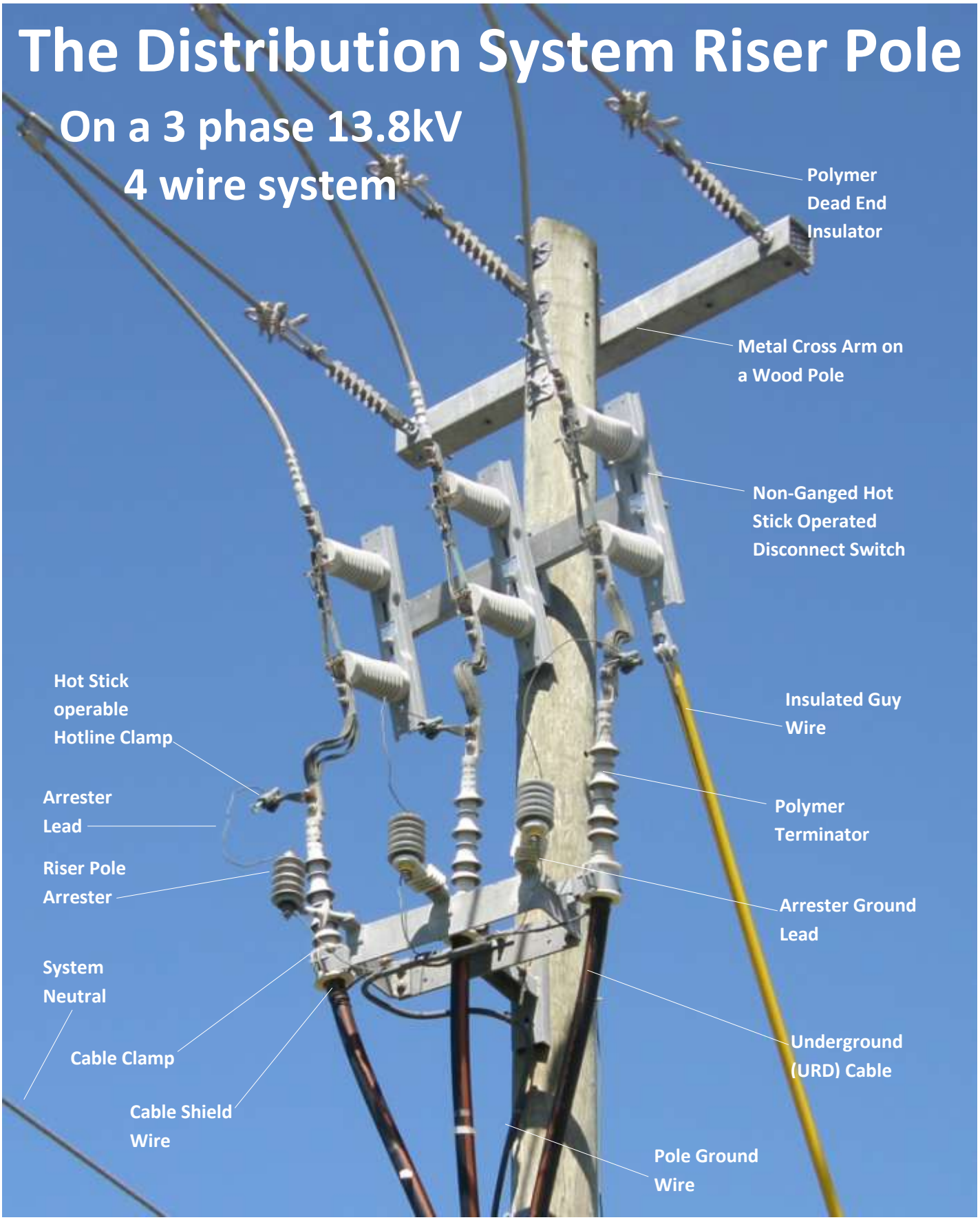
In the IEC market, it is quite common to use a class 2 arrester at terminal poles.

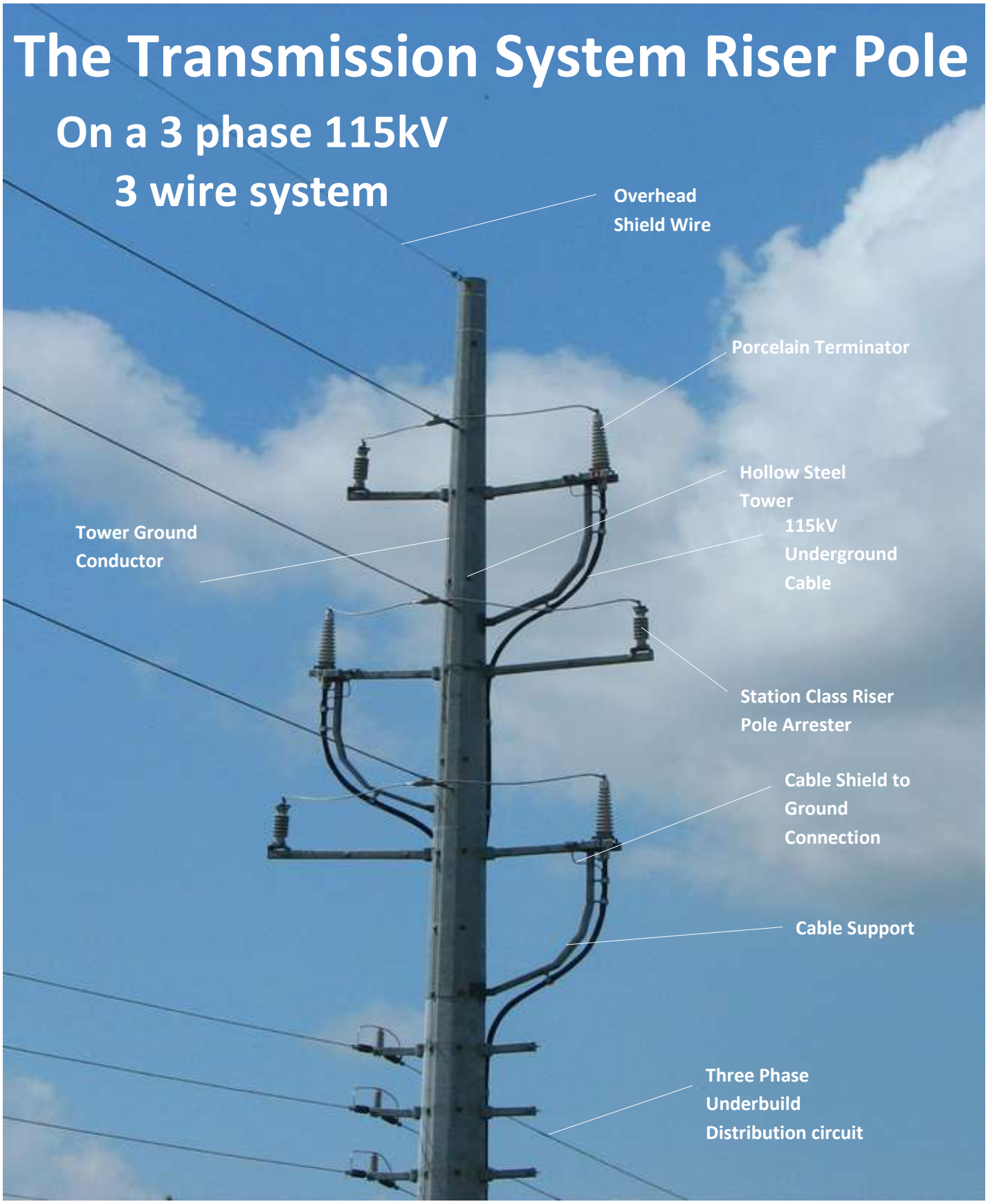
The Rationale for a Special Arrester at the Riser Pole

In underground circuits the capacitance of the system is quite high compared to overhead circuits. Due to this capacitance it is very likely that any voltage surge that enters the circuit will have its amplitude doubled at some point in the underground portion of the line. This amplitude doubling is due to the well known phenomena of traveling wave reflections. For example if a surge that was clamped at the riser pole at 35kV enters the underground circuit, it may reach as high as 70kV somewhere along the cable or at a transformer. (see Fig 3)

If the underground circuit has an aging cable system, 70kV could easily result in a failure of the system.

For the same reason, arresters are sometimes installed directly in the underground circuit at the pad mounted transformers.


The Distribution System Riser Pole
On a 3 phase 13.8kV
4 wire system
Polymer
Dead End
Insulator
Metal Cross Arm on
a Wood Pole
Non-Ganged Hot
Stick Operated
Disconnect Switch
Hot Stick
operable
Hotline Clamp
Insulated Guy
Wire
Arrester
Lead
Polymer
Terminator
Riser Pole
Arrester
Arrester Ground
Lead
System
Neutral
Underground
(URD) Cable
Cable Clamp
Cable Shield
Wire
Pole Ground
Wire


The Transmission System Riser Pole
On a 3 phase 115kV
3 wire system
Overhead
Shield Wire
Porcelain Terminator
Hollow Steel
Tower
115kV
Underground
Cable
Tower Ground
Conductor
Station Class Riser
Pole Arrester
Cable Shield to
Ground
Connection
Cable Support
Three Phase
Underbuild
Distribution circuit

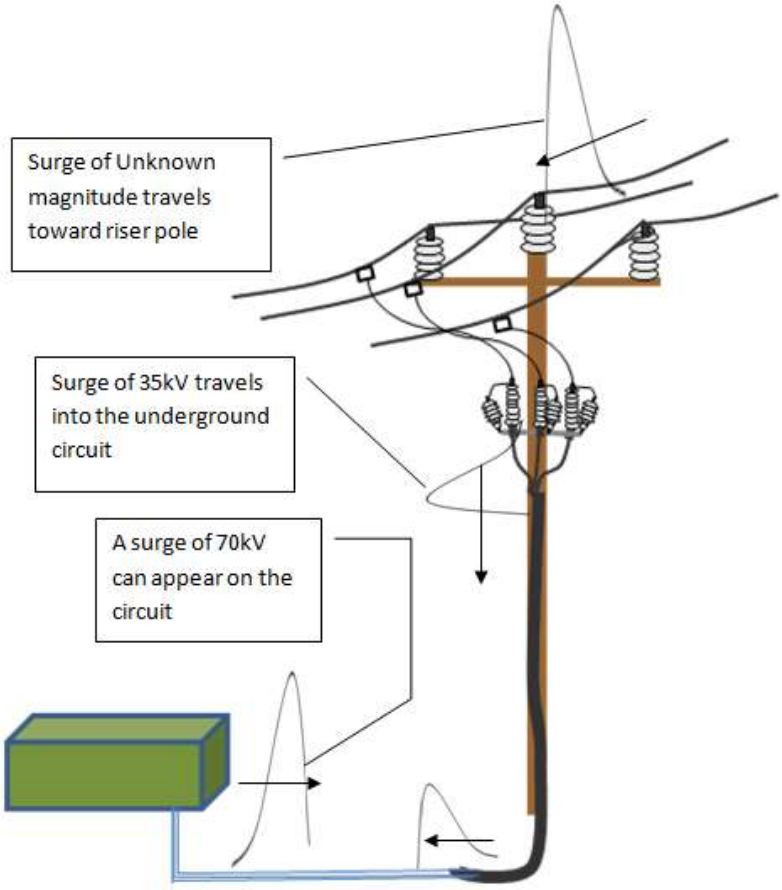


Figure 3 Voltage Doubling Example

Installation Considerations

As usual, it is always better to use the shortest possible lead lengths when mounting arresters. It is even more important in this case. As you can see in Figure 4, the top of the terminator should be as close as possible to the top of the arrester. The ground end of the arrester should be connected directly to the concentric shield of the URD cable. Both should be connected to earth as close as possible.

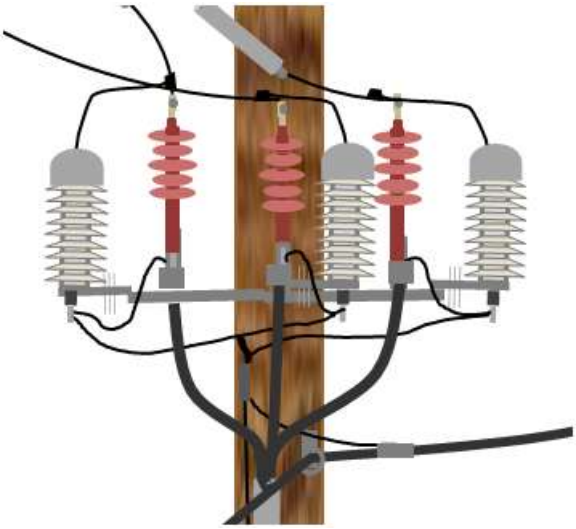


Figure 4 Example good installation

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Other ArresterFacts Available

Arrester Lead Length
Field Testing Arresters
Infrared Thermometer
Guide for Selecting an Arrester Field Test Method
VI Characteristics
The Externally Gapped Arrester (EGLA)
The Disconnector
Understanding Mechanical Tests of Arresters
What is a Lightning Arrester?
The Switching Surge and Arresters
The Lightning Surge and Arresters
Understanding the Arrester Energy Handling Issue
Understanding Discharge Voltage

Thank you for using www.ArresterWorks.com as your source of information on high voltage surge arresters.

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ArresterWorks