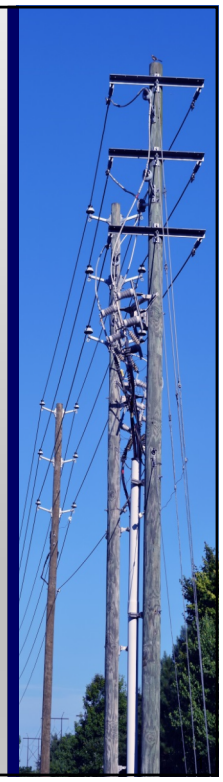
The information provided here is for informational and educational purposes and current as of the date of publication. The information is not a substitute for legal advice and does not necessarily reflect the opinion or policy position of the Municipal Association of South Carolina.
Consult your attorney for advice concerning specific situations.

Overvoltage Protection of Underbuilt Distribution

Court H. Weathers, PE

Booth & Associates



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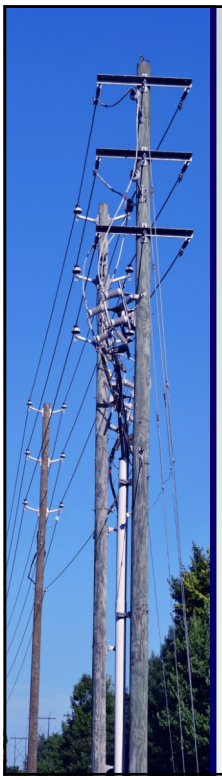

Station Class Surge Arrestors on Underbuilt Distribution

- August 9, 2007, Dominion field trials begin.
- Over 15 years: Dominion and FortisBC

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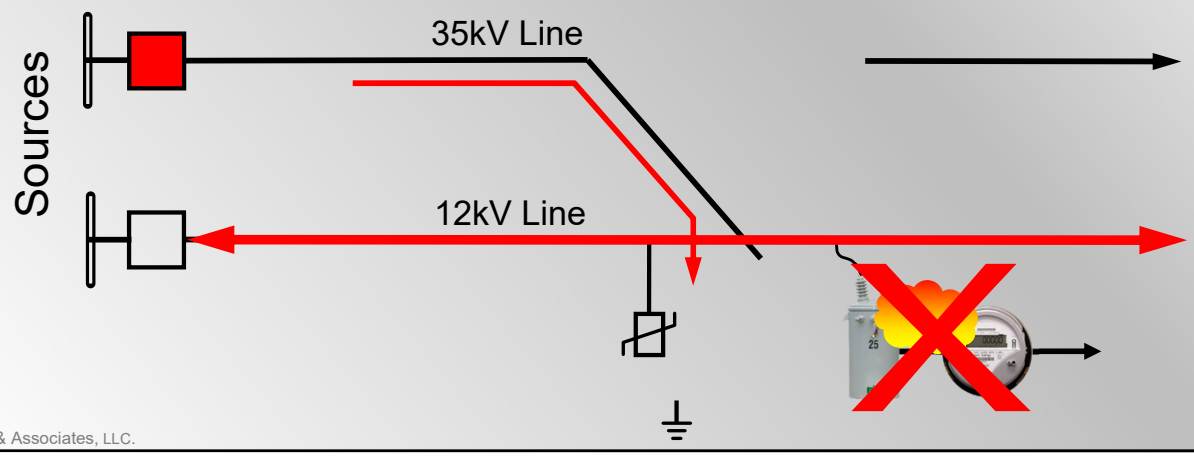
Existing



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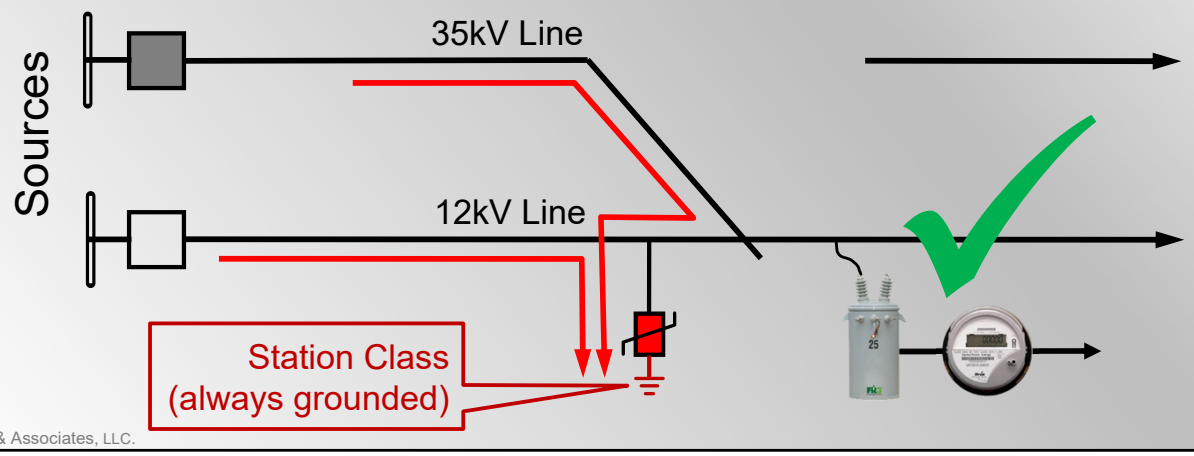
Proposed



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What's on a Pole

- Surge Arresters
  - Station Class
    - No Disconnector
    - Greater Energy
    - Robust Construction
  - Polymer
  - Proper MCOV

System Voltage (kV rms)		Recommended *Arrester Rating* (MCOV) kV rms	
Nominal	Maximum	Three-Wire or Four-Wire Wye Solidly Grounded Neutral	Delta and Ungrounded Wye
2.4	2.52	3 (2.55)	3 (2.55)
4.16	4.37	3 (2.55)	6 (5.10)
4.8	5.04	—	6 (5.10)
6.9	7.25	6 (5.10)	9 (7.65)
8.32	8.74	6 (5.10)	9 (7.65) 10 (8.40)
12.0	12.6	9 (7.65) 10 (8.40)	12 (10.2) 15 (12.7)
12.47	13.1	9 (7.65) 10 (8.40)	15 (12.7) 18 (15.3)
13.2	13.9	10 (8.40) 12 (10.2)	15 (12.7) —
13.8	14.5	10 (8.40) 12 (10.2)	15 (12.7) 18 (15.3)
20.78	21.8	15 (12.7) 21 (17.0)	24 (19.5) 27 (22.0)
22.86	24.0	18 (15.3) 21 (17.0)	24 (19.5) 27 (22.0)
24.9	26.2	18 (15.3) 21 (17.0)	24 (19.5) 27 (22.0)
34.5	36.2	27 (22.0) 30 (24.4)	36 (29.0) 39 (31.5)
46.0	48.3	36 (29.0) 39 (31.5)	48 (39.0) —

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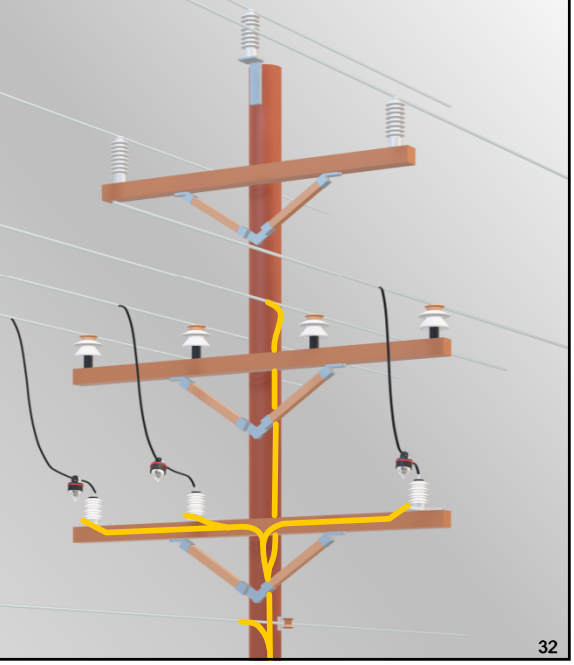
What's on a Pole

- Surge Arrester
- Grounds
  - Typical Equipment Ground Wire (#6 min. RUS)
  - 25 Ohm
  - Bond Neutral



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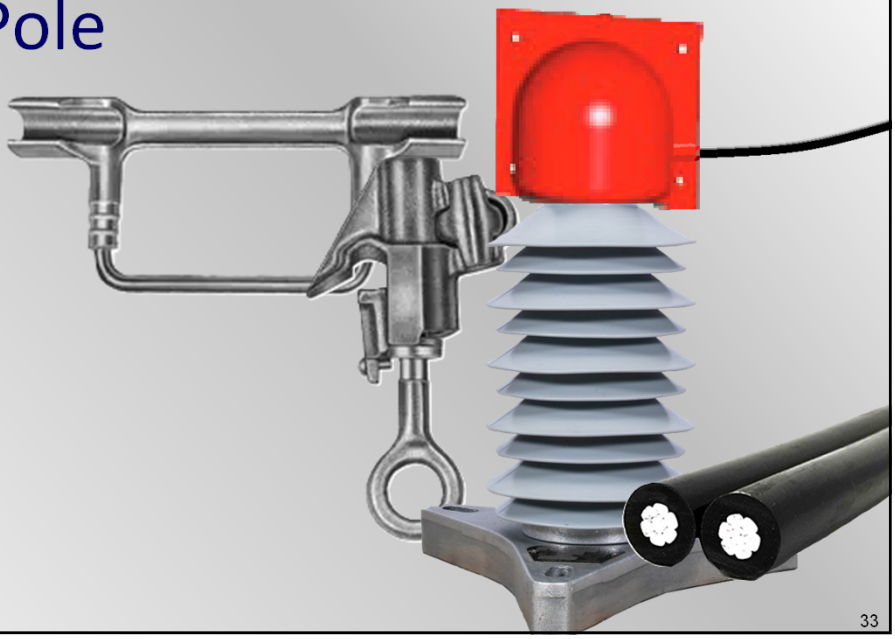
What's on a Pole

- Surge Arrester
- Grounds
- Jumpers
  - Stirrup & Clamps
  - Insulated Wire
  - Animal Guards



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What's on a Pole

- Surge Arrester
- Grounds
- Jumpers
- Fault Indicators
  - Fast Response
  - Battery Powered (No Load Current)

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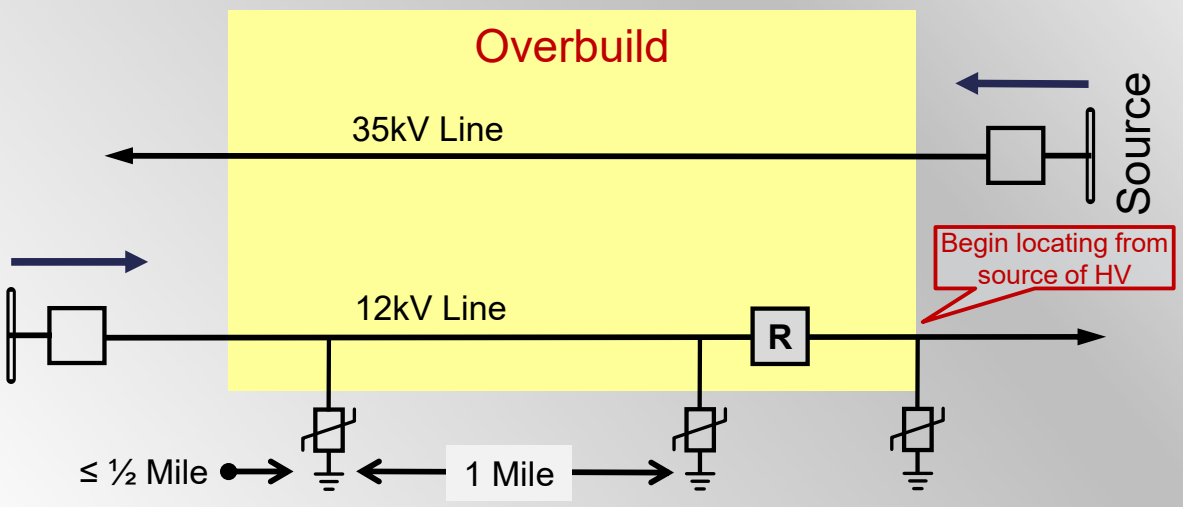

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Criterion

- Station Class Arresters
  - Permanently Grounded
  - Coordinated MCOV
- Application
  - Toward Source of Overbuild (HV is Source)
  - ~ 1 Mile (±¼ Mile)
  - Beyond Isolations
- Locations
  - Operational Pain-Points
  - Overbuild ≤69kV
- Installation
  - Pole Selection
  - Retrofit (Move Neutral & Comms)
  - Maintain Clearances
  - Verify Ground

Further Reading

IEEE Transactions

"Overvoltage Protectors—A Novel Concept for Dealing With Overbuilt Distribution Circuits"

Daniel J. Ward

IEEE TRANSACTIONS ON POWER DELIVERY, VOL. 25, NO. 3, JULY 2010

Overvoltage Protectors—A Novel Concept for Dealing With Overbuilt Distribution Circuits

Daniel J. Ward, *Fellow, IEEE*

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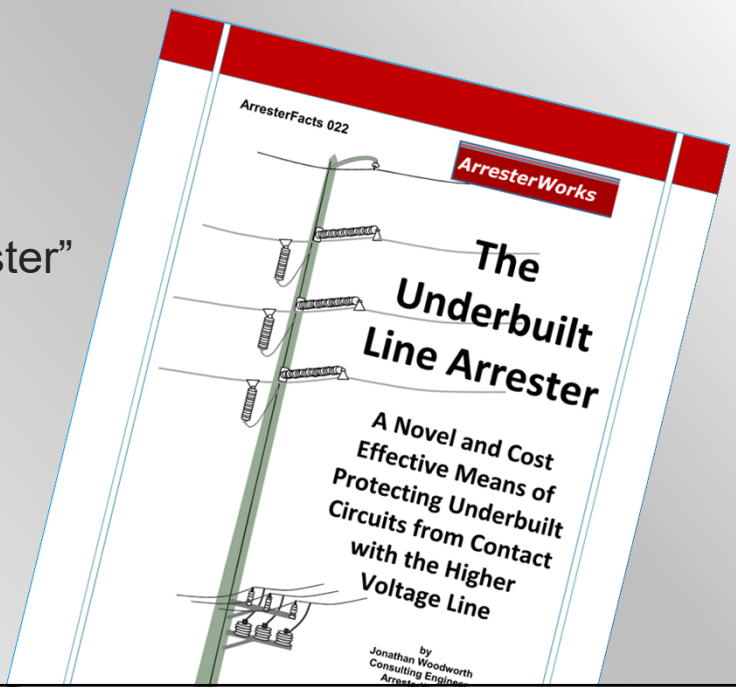
Further Reading

ArresterFacts 022

"The Underbuilt Line Arrester"

Jonathan Woodworth

www.ArresterWorks.com



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Further Reading

"Application of Station Class Arresters on Underbuilt Distribution Lines"

Aram Khalil-Pour
FortisBC

Daniel Ward
Dominion Energy

www.inmr.com

https://www.inmr.com/application-station-class-arresters-underbuilt-distribution-lines-3/


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