
Analysis of Use of Feeders to Minimize Lightning Strikes on Medium Voltage Networks

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ABSTRACT

Electricity no could separated with life society . Benefit energy electricity for life man very a lot of source lighting and needs other . By because that very required reliability in electrical energy delivery from center generator power electricity until to consumer . A proper protection system is needed could prevent happening damage in particular on feeder 20 kv . Frequent things occur for example occur disturbance strike lightning that can result in damage and cut off delivery of electrical energy . By because that for prevent happening disturbance caused _ by lightning the eat coordination safety lightning (arrester) must conducted with good . PT PLN (Persero) Pematang Area Siantar is a service unit serving customers needs electricity in the area Pematang Siantar and surrounding. PT PLN (Persero) Pematang Area Siantar also To do care , and repair on network voltage medium 20 kV distributed from substation parent to consumer.

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1. INTRODUCTION

Electricity is needs main for a region whose economy currently grow , increase needs supply energy electricity for society . Benefit from first electric that is as source explanation . With existence electricity , life of course Becomes more bright . Before existence electricity , lighting many use candle or lamp paste . Needed oil for make lamp paste or candle made alone lit. Of course just Thing this feel more troublesome than with moment this . Almost every home, every segment Street until places general already use sourced light energy electricity. With existence lamp, you can To do many things at night day. Start from can reading , working until feel more safe when pass dark area. Source lighting this capable replace light sun moment night come . Protection system power electricity installed on equipment electricity something system power electricity, for example generators, transformers, networks and others, against abnormal operating conditions system that alone. That abnormal condition could in the form of including: contact short, voltage more , load more, frequency system low, asynchronous and others. function main protection that is Detect existence disturbance or other abnormal conditions on part the system it holds . Release part disrupted system , so that part system others who don't experience disturbance could Keep going operate.

A. Feeder 20 kv

feeder is part of the distribution of electricity from the substation to reach consumers. One of the causes of blackouts is caused by disturbances in the 20 kv feeder.

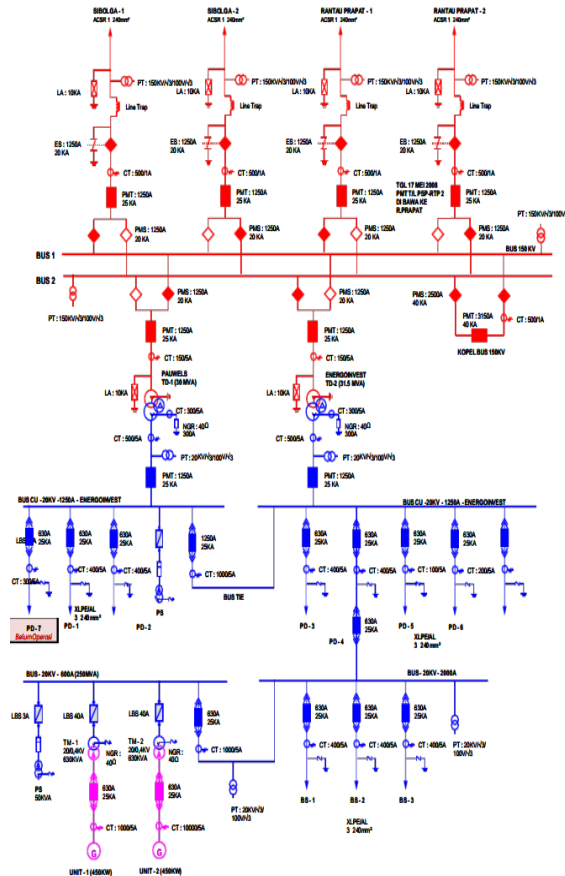


Figure 1. Picture of single line diagram of UPT Pematang Siantar

If there is interference in the feeder it usually takes quite a long time to fix it. So it is expected that interference in the feeder is avoided so that the distribution of electrical energy can be carried out continuously.

B. Arrester 20 kv

Arrester lightning or abbreviated arrester, or often also called antidote lightning is tool protector for equipment system power electricity to the sky lightning. He apply as Street by-pass around isolation. Arrester forming easy way traversed by current lightning or lightning, so no arise voltage more high on equipment so that no disturb Genre current power 50 Hz system. Adi on the normal work of the arrester apply as an insulator and when arise the sky he apply as conductor, so skip high current. After the sky missing arrester must with fast return be an insulator, so disconnection power no had time open. Different with interrupt talking rod upfront arrester can decide continuation without cause interference. here one of function important from arrester (TS Hutahuruk). Arrester itself no have function as barrier Among voltage more and system, but more to carry on voltage more going to land. here uniqueness individually owned by arresteryang have arrester fault properties. He can limit and recognize voltage system. And only character conductive (with R value is close to 0) when the sky lightning about it. Arrester alone also must have prisoner isolation so that when occur the sky lightning, he no broken and permanent can operate function as where should be. By because it's important wish discussed a little about system isolation and things that affect it. 20 kv. arrester drawing like shown on picture below this.



Figure 2. Arrester

C. Arrester installation in 20 kv . feeder

Arrester installation on feeder from 20 kv to transformer distribution like showed on image below . The use of arresters on position this that is if occur disturbance on 20 kv . network so disturbance made will be thrown away through arresters. So that transformer distribution will protected if occur disturbance voltage more as caused lightning .

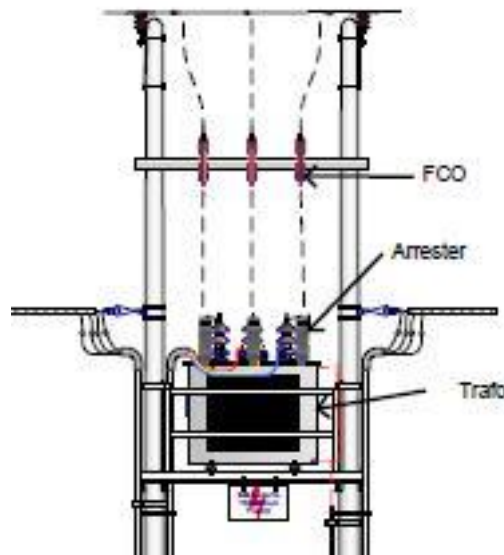


Figure 3. Arrester in distribution transformer

2. RESEARCH METHOD

Based on the study to be studied , the *flowchart* of this research is as shown in the following figure.

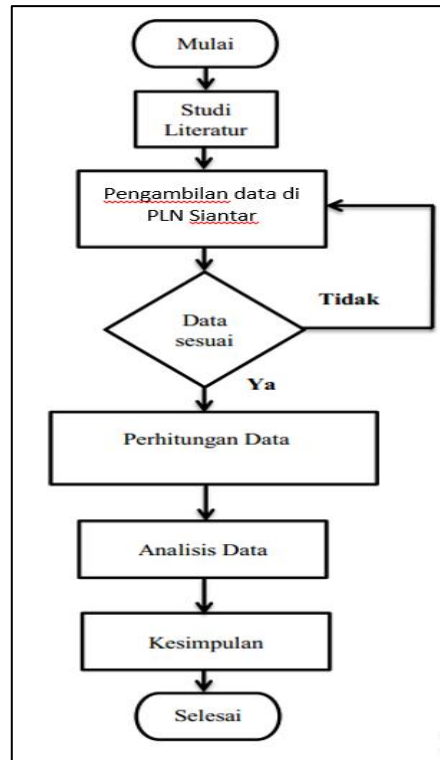


Figure 4. Research flowchart

3. RESULTS AND DISCUSSIONS

Installed arrester data

Installed arrester data on PLN UPT Pematang siantar namely :

1. Condition climate , including :
 - a. Position geography : equator
 - b. Humidity : 20 to 80%
 - c. Ambiem temperature : maximum 37°C Average daily 27°C Minimum 17°C
2. Characteristics Channel :
 - a. Height wire above surface soil i.e. 11 m
 - b. Point neutral grounded with resistance 10 ohms
3. Characteristics of lighting arresters:
 - a. Voltage rated 24 kV
 - b. Current nominal discharge 5 kA

Transformer to be protected located on channel air voltage medium (SUTM) with data:

- a. Capacity transformer : 250 kVA
- b. Primary voltage : 20 kV
- c. Voltage secondary : 220/380 V

4. CONCLUSION

Study this discuss protection in feeder for minimize strike lightning on network voltage medium . Results study this could concluded as following :Arrester characteristics on network 20 kV distribution i.e. voltage rated 24 kV and current nominal discharge 5 kA. Installation of arresters with proper installation _ could minimize disturbance specifically disturbance samabran lightning.

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