Electrical Blog No. 34 - Line Arrester

Line Arrester

Transmission overhead lines are more prone to lightning strike since they are erected high up into the mountainous area. According to past tripping records, a large number of supply interruptions were caused by lightning. Lightning strikes to overhead lines (OHL) can cause supply interruptions and create power quality problems to the customers due to voltage dip, such as flicker of lighting.

When lightning strikes the overhead line, the tower voltage will rise. This may cause flashover across insulator arc horn gap and circuit will trip. With the presence of line arrester (LA) on tower, it will suppress the rise of tower voltage, prevent flashover and avoid circuit tripping. So, the chance of supply interruption and voltage dip due to lightning can be reduced. The LAs are installed on OHL with voltage level up to 500kV.

LA will be installed in critical locations which are selected based upon the assessed risk level of individual circuits and towers attacked by lightning. The past records of lightning induced faults, the topographical location, terrain of the nearby area and the lightning density are the major criteria to be considered for LA installation on OHL.

One of the line arrester design is air gap type arrangement. The air gap is provided in series to a LA unit. The advantage of the series air gap is to allow fast restoration of the circuit. It prevents flashover due to switching surge when re-energizing the circuit. Even the LA unit fails under excessive lightning, the air gap also enables re-energizing the circuit. Therefore, LA is an effective means to improve lightning performance.

The Electrical Blog is contributed by the Electrical Division. If you would like to know more about this topic, please contact the Division Hon Secretary, Ir K.M. LEUNG at 'kmleung@emsd.gov.hk'