



MD'S ADDRESS



which our team is carrying themselves both in the personal and professional fronts. successfully

I see a responsible team taking good care to follow all norms of Covid and still working very hard to achieve their professional goals

I appreciate the winning spirit which is truly the spirit of this Diwali which is all about victory.

I wish my team, our partners, friends and well wishers all the success in their endeavours

Regards,
M N Ravinarayan
Managing Director

Dear Team Mates,

I wish you and your family a very

Happy Diwali!



2020 is almost been a non existent year for most of us.

But for Taurians in spite of all the odds being against us, I am happy to note the good spirit with



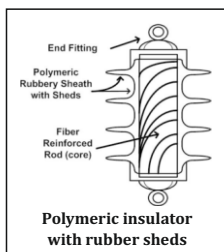
May you live your life like the festival of deepavali happy healthy and wealthy.

Happy Diwali

Corona effect on Composite/Polymer Insulators

In early 1960's, first modern non-ceramic insulator (NCI) was introduced. They are often also called polymeric insulators, with advantages over traditional counterparts of low weight, vandalism resistance, hydrophobic surface properties, etc., showing a steadily increasing share of the insulator market.

In the struggle on the way of polymeric insulators becoming broadly accepted on the market as an alternative solution to the traditional porcelain and glass counterparts, an adequate standard has not existed until now. As a result, CIGRE defined the physical parameters important for the use of polymeric materials in outdoor insulation and on checking if relevant test methods are available today. Twelve properties have been identified, among which the resistance to corona and ozone was listed as being of great importance.



What is Composite / Polymer Insulator?

Composite insulators are design in such that they offer a very high surface leakage resistance. This structure has a fiber reinforced rod as the main strength member, which is

covered on outside by a polymeric rubber. The whole structure is then fitted with two end fittings to make a complete insulator in one assembly. This is the reason they are called composite insulators since the complete insulator is one unit as shown in Fig.1

Corona discharges and polymeric insulators

The corona is a weak luminous discharge that usually takes place in a strongly non-homogeneous electric field at/or near atmospheric pressure due air ionization surrounding an insulator in which exists a critical voltage gradient. This process is accompanied by excitation of Nitrogen molecules and by chemical reactions, leading to:

- Production of corrosive chemicals like: Ozone and Nitrogen Oxides. At high humidity the oxides will create Nitric acid – a very corrosive material.
- Radio interference, Audio noise, Emission of UV radiation

Corona discharge as an ageing factor to polymeric insulators has long been recognized. Generally, there exist two main sources of corona discharges on the surface of composite polymeric insulators in the field

- Poorly designed insulator hardware (including corona rings): This source acts locally and may

promote ageing of insulator housing, even at dry conditions. However, proper hardware design of field grading devices allows avoiding it effectively

- Presence of water droplets on insulator housing surface: Here unavoidable presence of water droplets on insulator surfaces acts as a discrete and distributed source of corona that yields ageing at different insulator parts. Discolouration, erosion, and sheath/shed cutting were reported among the effects. Such damages can be attributed to the action of energetic ions and reactive gases from the discharge, ozone and nitrogen oxides, and possibly UV radiation

Corona Camera

Corona imaging offers the ability to pinpoint the exact corona source location, and display the corona and its emitter. To reveal the corona source in it's early stage you need to use a high sensitive corona camera. Corona is emitted in the Ultra Violet spectral range, which is invisible to the human eye. To be able to see corona in daytime Ofil's camera system uses two imaging channels: UV and visible. The outputs of the two channels are overlaid to yield the image of the corona in its real and exact visible scene.

Prepared by
Mr. Naushad Ansari, Senior Executive-Pre sales

Travel:

As the states started relaxing the travel restrictions, Taurus team immediately started travelling taking full precaution related with Covid-19. The mode of travel in last three months were by road or by air. We completely avoided the Rail travel during this period. Our team was used to leave early morning and return back to the base by night to avoid the stay at a different place. But it was not possible always. In such cases, though expensive, better accommodation was provided keeping the safety in mind.

Majority of these travels were towards “Tender Demo” or “Post sales demonstration”. This is because more and more customers are preferring “On Site Demonstration” over the “On line Demo” since all the features and specification can be properly checked only during an “On Site Demo”. All the demos we did in last quarter were successful. This quarter we also saw the surge in sales of our Insulator Testers and Earth Testers.

Our Bangalore and Kolkata offices become fully functional at the end of this quarter. Now everyone has started attending offices in these two places. Our Delhi and Mumbai offices are yet to be operational. These will be opened as soon as the condition improves there. Also we are planning to open a new office at Guwahati to cater our customers at North East.



STITAM Projects:

Our Testing wing STITAM bagged two prestigious orders TTHA (Transmission Tower Health Audit) and LID (Leaky Insulators Detection) in last quarter and the work in progressing very well at both the sites. This is the first time in Taurus, two big Testing projects are being executed simultaneously in different parts of the country. Also we are using a State Of The Art software to capture the data at the site which is helping in speeding up the Data Processing and Analysis work. We are expecting few more STITAM orders in near future where this software will be very much useful in receiving the site data quickly and also in having better control over the project.

LID - Leaky Insulator Detector:

Our newly launched product LID gained excellent momentum during last quarter. Using this innovative equipment, one can detect punctured insulators in a substation or a tower from a safe distance without climbing up the tower. We had many successful demonstration of this product at several customer places. Everybody found this equipment very useful and appreciated this innovative product. The future for this product is very good. Also we received an order for our STITAM division for inspecting the tower line insulators using this equipment. A special mobile app is being developed to capture the readings in digital format which will be helpful in making the trend analysis.



THIRD HARMONIC LEAKAGE CURRENT MEASUREMENT AND HEALTH MONITORING OF SURGE ARRESTERS-B1 METHOD- QUICK, ACCURATE, SIMPLE & SAFE

Abstract

Surge arresters are installed on transmission and distribution substations between phase and earth in order to improve the lightning performance and reduce the failure rates. High-energy stresses and housing deterioration are the main factors of degradation and damage of surge arresters. Thus, there is need for testing and monitoring the surge arresters, in order to verify their good condition and their ability to effectively protect the lines.

There are number of methods are available to measure the arresters leakage current like compensation method, harmonic analysis method. The most common method used, is the measurement of the arresters 3rd Harmonic Current as per **IEC-60099-5-B1 due to quick, accurate, simple & safe**, which is an indicator of the surge arrester's condition, since every change, deterioration or damage leads to an increase of the 3rd Harmonic leakage current.

Lightning strikes are the main reason for outages in overhead transmission system. In an effort to maintain high power quality and to avoid damages and disturbances, overhead ground wires and surge arresters are used for the Transmission/Distribution system protection.

A vital aspect of asset management on power systems is understanding the remaining life of a Surge Arrester. Predicting the life of this component while on-line or off-line is an onerous task at best. Testing

surge arresters in the field is important on both transmission systems and distribution systems since they are extensively applied in both.

According to IEC60099-5, measurements can carried out on-line under normal service voltage is the most common method. The non-linear voltage-current characteristic of a metal-oxide arrester gives rise to harmonics in the leakage current when the arrester is energized with a sinusoidal voltage. The third harmonic is the largest harmonic component of the resistive current, and it can be used for diagnostic measurements of Surge Arrester.

This 3rd Harmonic Leakage Current measurement as per **IEC-60099-5-B1** for Surge Arrester Assessment is rapidly becoming the method of choice due to **quick, accurate, simple & safe** for arrester users interested in excellent long term maintenance of arresters. This method has been developed for the current generation of Metal Oxide Arresters. This method is the most accurate in predicting the life of an arrester and offers the most relevant data with regard to the past and present status of the arrester. IEC Standard 60099-5 has an annex devoted to this type of field testing of arresters.

An enterprising product "TAURUS MULTI:ALCL-40" which is designed as per IEC60099-5 B1 method for online 3rd harmonic leakage current measurement on metal-oxide surge arresters can be used for Measuring & Monitoring.

Benefits of Method-B1 over Method-B2

Sl. No	Method-B1 (TAURUS MULTI -ALCL-40)	Method-B2 (others)
1.	Ease of use due to portability	Handling complexity due to bulky kit
2.	User Friendly & Light weight. Speedy & Quick LA testing is possible	Very difficult to connect, heavy weight & complexity in testing due to Compensation Probe. Very Slow & cumbersome to use
3.	Very Safe to use due to non-requirement of Compensation Probe	Harmonic compensation probe need to connect at surface of Surge Arrester mounting structure, which is quite dangerous. "Hence not safe for the testing personnel".
4.	Taurus-LA test kit is having quite unique & sophisticated CT which enables to measure very low range current with minimum resolution of 0.1µA and accuracy 1.2% for RMS defensing outer electric noises/interference/induction.	The CT used for the Leakage current measurement by the Method-B2 were having low accuracy, between 5%-10%, due to this the values obtained from them are higher.

TESTING METHODOLOGY:



- Insert the plug of CT to the position "CT INPUT" of the instrument body.
- Clamp CT to the Earth wire coming from Surge Arrester to Surge meter/counter, make sure clamp CT before the surge meter.
- Set mode switch to "RMS" position and range switch on 300µA.
- If "OL" sign display on LCD, change the range switch to 3mA.
- Wait for 5sec so that the displayed values get stable and note it down.
- Change the mode switch to "1st H" & "3rd H" and repeat step 5.

CONCLUSION:

As explained earlier, LA is one of the most vital devices used to protect the power equipment's such as transformers etc. against over voltages including lightning surges. Therefore, it is quite imperative that the health/condition of the LAs at Sub-Stations is to be monitored at a regular interval by measuring third harmonic leakage current with the help of measuring instruments preferably **Method-B1 (TAURUS MULTI-ALCL-40) due to Quick, Accurate, Simple & Safe, which enable substation maintenance personnel to do frequent measurement because of portability & ease of use at site.** Further, a database for the third harmonic leakage current for all the LAs (make wise) is to be developed and analysed. A threshold/critical value of third harmonic leakage current is then to be specified based on the database developed over a period of time.

For Full Paper, please click the below link:

https://tauruspowertronic-my.sharepoint.com/:b:/g/personal/marketing_tauruspowertronics_com/ETyLx-6AZQ10oB6apUW10d8B1jtGUX-E3cFSNr4vBEt4g?e=v1ps5d

Prepared by **Mr. Pankaj Kakoti**-Manager-Products

NEW CONCEPT & METHODOLOGY ON TOWER LEAKAGE CURRENT MEASUREMENT & ULTRASOUND DETECTION FOR INSULATORS HEALTHINESS

Abstract

Electrical insulation is an important part of all electrical systems. **The Transmission Line Insulators under operation are subject- to many stresses like electrical stress, mechanical damages, vibration, excessive heat or cold, dirt etc. which lead to the insulation failure of the Insulators & causes leakage current to flow & subsequently fail or trip the line.** So to monitor the leakage current is an important parameter to be considered by Electrical Utilities & Transmission Companies. This paper highlights the concept and importance of Leakage Current measurement on Transmission Tower & Ultrasound Detection on Insulators to Identify the Leaky Insulators typically with Taurus LIDOR for predictive & preventive maintenance Also this paper emphasizes the necessity as a pre-check of Tower Earthing measurement with high frequency Resistance & Impedance Tester (Taurus: Preziohm TFR) before measurement of Tower Leakage current to confirm the good earthing at the Tower Leg, so that current will flow through the Tower Leg to ground & reliable Tower Leakage Current measurement can be achieve for right decision to identify the faulty insulators.

NEW CONCEPT & METHODOLOGY TO CHECK THE LEAKY INSULATOR

New concept has been found to check the Leaky Insulator by measuring the Tower Leakage Current & conducting the Ultrasound Detection with equipment typically (TAURUS-LID) on Insulator Strings to Identify the Leaky Insulators. Basically Methodology has been categorized in two part as mentioned below & shown in Fig-B

Step-2:

1. Measurement of Leakage Current at Tower Legs, three setup has been shown & explained: (Any one setup can be used as per requirement of the site)

- a) FCM-100 (200mm Diameter CT Sensor)- Shown in Fig-1
- b) FCM-400 (400mm Diameter CT Sensor)- Shown in Fig-2

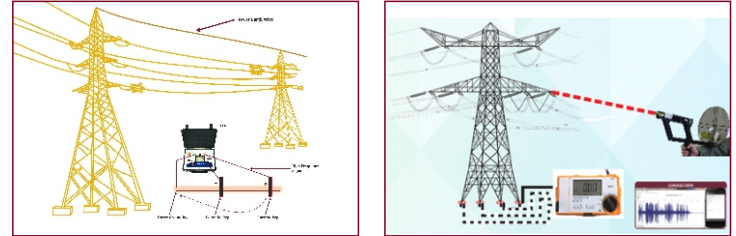
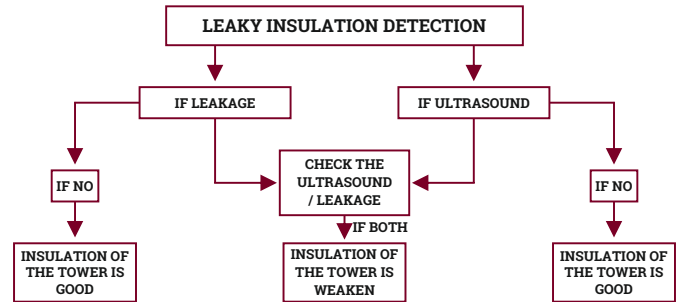


Fig-A

Fig-B

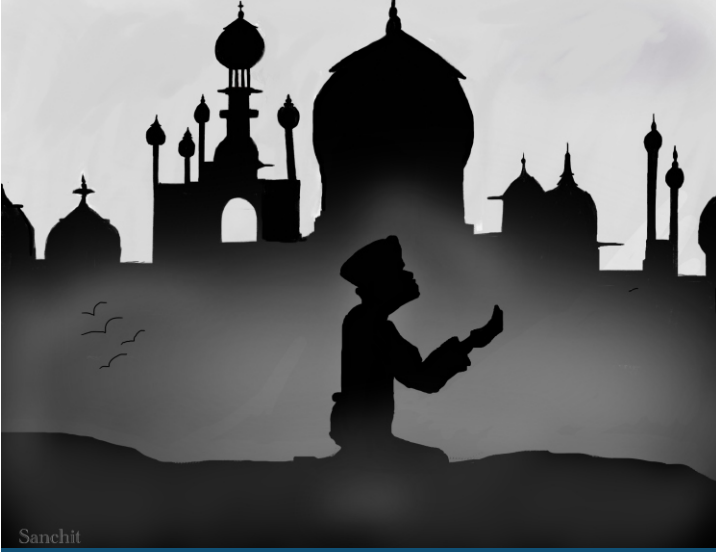


Prepared by **Mr. Pankaj Kakoti**-Manager-Products & **Mr. Amim Shabaz**-Sr. Executive-Presales

Photo Gallery - Men at Work



Hidden Talent



Sanchit Srivastava

EMPLOYEE OF THE QUARTER-1 & QUARTER-2



PRAJITHA KAMAL
Sr. Executive - Accounts
QUARTER-1



PANKAJ KAKOTI
Manager - Product & N.E BD
QUARTER-1



SANCHIT SRIVASTAVA
Senior Engineer-Technical
QUARTER-2



MD AMIM SHAHBAZ
Senior Executive-Pre sales
QUARTER-2

Birthday Wishes this Quarter

Sharath Raju B	23 Nov	H M Ravi	11 Jan
Shrivatsa Kulkarni	24 Nov	Anurag Soni	09 Feb
Anbu A	23 Dec	Sanjay R	18 Feb
Dipan Chattopadhaya	27 Dec	Alex Gerald	22 Mar
Turjoy Dasgupta	17 Dec	Bikesh Kumar Roy	05 Mar
Santosh Kokare	25 Dec	Vinaya N S	21 Mar
Ashok Dash	07 Jan		

From Editor's Desk



Dear Taurus Team,

They say Time Flies. Yes. Very true. So quickly 6 months are passed since we reopened our office after Covid-19 lockdown. Everyone at Taurus has become extremely busy and many of us have started travelling like earlier.

I thank you all for taking some time from your hectic schedule and contributing with your articles and print material for this second issue of Watts Up quarterly magazine.

Also our new website is going live today. There are few changes yet to be done in it. This will be completed by this month end. I thank you all for providing data, suggesting changes / corrections and making it possible to launch our website today.

Wish you all very happy Diwali.

Take care and stay safe.

By Anil Deoraj Business Head - STITAM & Product Marketing

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