

# INDUSTRIAL OUTLOOK

AN INSIGHT ON INDUSTRIAL MANUFACTURING AND ENGINEERING PRODUCTS

ISSUE 14 - FEBRUARY 2021

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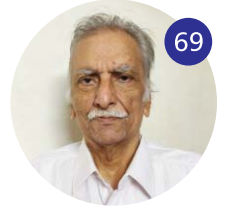
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# ONLINE TESTING SET (OLTS)



An Article By **Mr. RB Patel**  
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## WE, THE GPRD CELL

Gujarat Power Research & Development (GPRD) Cell is a research center established by the Government of Gujarat for Gujarat Urja Vikas Nigam Limited (GUVNL) and its subsidiary Companies namely GSECL, GETCO, DGVCL, MGVCL, PGVCL and UGVCL. GPRD Cell is working under Gujarat Urja Vikas Ltd (GUVNL) and is funded by the Government of Gujarat through GUVNL.

The success of the leading companies depends on the strength of their efforts employed towards R&D. Such Companies spare and spend a huge amount of funds and manpower for R&D activities. With this concept and considering the future requirements of the Power sector of Gujarat, an independent R&D Cell, called GPRD Cell has been established.

## ABOUT THE PRODUCT - OLTS

This article is regarding the development of equipment for accuracy check of HT CTs and PTs and HT TVM installed at the HT Consumer and that too without any Power

interruption. As we know that the HT Consumer is a key stakeholder for any DISCOM as being a major revenue source. Perfect and errorless HT metering is an essential part of any DISCOM. The Current Transformer (CT), Potential Transformer (PT), Energy Meter and Control Cable are the key components of the HT Metering system. The accuracy of all the components is highly important for the errorless measurement of Energy consumed by the HT Consumer. Therefore, periodical checking of the accuracy of all the components is very essential. Sometimes, due to the failure of CT & PT, they are simply replaced and the accuracy of such instruments remains unknown forever, which may lead to a huge revenue loss to the DISCOMs. So, it was highly required to develop the equipment which can be used to check the accuracy of HT CTs, PTs and TVM without Power interruption to the valuable HT Consumer.

Looking to the high-level requirement of the perfect and authenticated testing set up at real loading conditions, the GPRD team has taken up the research project to address the difficulties faced by the DISCOMs and developed an innovative product called "ONLINE TESTING SET" (OLTS) for HT Consumer.

## PRESENT PRACTICE

As per the present practice, DISCOMs test the Energy Meter of HT Consumer at the site periodically using accucheck type of standard Energy Meter. During such testing, it is possible to test only the Tariff Energy Meter of the HT Consumer at real loading without interrupting the Power supply, but, testing of CTPT unit is not possible at real loading





Dr. Mahesh Singh, Hon'ble MD, UGVCL inaugurated "On Line Testing Set(OLTS)" on November 11, 2020, one of the distinct products - designed and developed by Gujarat Power Research & Development Cell, GUVNL, Gandhinagar.

without interrupting the Power supply. The combined CTPT unit is tested in the off-load conditions either at Utilities' Laboratory or at the site under standard test conditions. The standard test condition does not give the actual result of the performance of the equipment under test, as the actual load would be having based on many non-standard Parameters like various orders of Harmonics, Voltage fluctuations, Current fluctuations, Voltage surges, Voltages spikes etc. It is required to know the behavior of the Energy Meter during such abnormal load conditions also. Thus, testing of the Meter at standard test conditions does not serve the purpose.

In the case of the HT Consumers, they are the major revenue source for any Utility. The minor error of the CTPT unit may result in a big revenue loss to DISCOMs. At present, once the CTPT unit is installed at the HT Consumer installation, it is quite impossible to test during its entire service life on real loading conditions. In many cases, when the CTPT unit fails, its error can never be known and DISCOMs loses the revenue permanently. To avoid this

situation, it is highly required to test the whole Metering Set, which consists of HT TVM, CTs, PTs and the Control cable.

#### ABOUT - ONLINE TESTING SET(OLTS)

The HT Metering System comprises HT TVM, CTs, PTs and Control cable. It is convenient to test the Meters either at the site or at a laboratory. However, testing of CTs & PTs at the site at real load is difficult or impossible. Therefore, to facilitate HT Metering testing at the site, the GPRD Cell has specially designed and developed a product called "ONLINE TESTING SET(OLTS)".

The OLTS comprises high accuracy resin cast HT CTs of 0.05 Class, High accuracy resin cast HT PTs of 0.05 Class, two nos of isolation VCBs, 11 KV class XLPE/Rubber insulated copper flexible three Single-core cables, Hotline tap clamps, ERS, Telescopic operating rod and its Control wiring etc. The provision of temporary body earthing and cable screen earthing is made. This complete setup has been mounted on a Utility's vehicle/van.

## HOW TO USE THE OLTS

The OLTS van is taken at the installation of an HT Consumer's HT Meter's under test. The body of the OLTS is locally earthed properly. In live condition, the Power terminal of an incoming cable of R phase of OLTS is clamped on one side of the AB switch / DO Fuse of the HT Consumer and the terminal of the outgoing cable is clamped at another side of the AB switch / DO Fuse. In the same way, live terminations of Y and B phases are done. After completion of terminations, incoming side VCB is made ON and the correct phase sequence is ensured. After the OK confirmation of phase sequence, outgoing VCB is made ON. Then after AB switch / DO Fuses are opened. Now, the CTPT and standard Meter of OLTS have come in series of the CTPT unit and Tariff Meter of the Consumer installation. All instantaneous electrical parameters and Energy recorded in the Tariff Meter is compared with OLTS ERS. One can easily work out the exact error of the CTPT unit and Tariff Energy Meter under real loading conditions and that too without interrupting the Power supply of the Consumer.

## STRATEGIC ABILITY

The objective of the pilot project for the development of mobile HT Meter Testing Setup

### SOUNDLESS NATURES

- An onsite testing solution at real loading of HT Consumer metering set
- DISCOMs can do it, without the help of a third party or outsource
- Promising large scale testing in minimum time
- A cost-effective solution
- Huge revenue leakage due to hidden error of CTs and PTs can be eliminated
- No need for extra and skilled staff set up

on the vehicle is to detect the error of the Tariff CTPT unit installed at the Consumer's site without interrupting the Power supply of the HT Consumer.

Over and above, OLTS can be used to work out exact Energy loss of a particular loaded section of a distribution line. So that decision for replacement of conductor can be taken to avoid Revenue leakages due to loss in a particular section as a result of excessive loading. The confidence level of the Consumer and the utility regarding the accuracy of HT Metering System will improve.

## CONCLUSION

With the help of OLTS, the error of the CTPT unit and Tariff Meter can be worked out separately. In a nutshell, the leakage of the DISCOMs' revenue, due to hidden error in the CTPT unit can now be easily trapped and the decision can be taken to replace the CTPT unit and for revenue recovery of unrecorded Energy.

## FIELD STUDY REPORT

On a pilot project basis, one OLTS has been successfully developed and commissioned and being monitored at Hi-Tech Meter Testing Laboratory, UGVCL, Circle Office, Sabarmati, Ahmedabad. The OLTS is found to work satisfactorily. Field Engineers and technical staff have been giving very good reviews for the innovative product.

## PATENT DETAIL

The GPRD Cell has registered a Patent application of OLTS vide IPA no. 201821011764 at the Patent Office of the Government of India.

For more details, please contact us without any hesitation, we are at [www.gprd.in](http://www.gprd.in)