



Gujarat Power Research & Development Cell

(A Govt. of Gujarat Initiative)

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HTMC (HT Metering Cubical)

Title of the Research: HTMC (HT Metering Cubical)

Present System: In present system of the DISCOM, the conventional overhead HT metering system is on Double Pole structure; either on PSC or RSJ Poles, for the installation of the combined CTPT unit of various capacities, and the HT metering set with SMC on the same DP structure. This overhead network for HT metering undergoes through various atmospheric conditions and prone to failure. This system also does not look aesthetically good in the distribution network.



Limitations of the present system:

- The HT Consumers generate the maximum revenue for any DISCOM. Hence, it is desirable to provide the uninterrupted power supply to this esteemed array of the consumers. The overhead network is a susceptible one, which gets affected due to weather and manual operations.
- The components of the overhead network are prone to failure, due to environmental and atmospheric impacts. The disc and pin insulators, when failing; it becomes utmost difficult to locate the place of the specific fault. Snapping of conductors, burning of jumpers and bird faults are the other serious incidents, causing a power interruption, chances of accidental hazards and loss of revenue.

- The double pole overhead structure gets easily affected by lightning strokes, which leads to - not only the loss of power but also, failure of the metering components and measuring devices.
- The overhead DP structure is normally operated by a semiskilled staff of utility or the consumer. It may result in malfunction of the components and sometimes leads to the accident, which may cause loss of life or damage to the system components.
- Replacement of CTPT unit requires additional staff and a mechanism like a chain pulley block in this system. It is the wastage of men hours, machine, and revenue.
- It is also experienced that while commissioning and testing of CTPT and meter at the site in live conditions the CTPT gets exploded and causes a serious accident, deep burns to staff.
- It does not have the aesthetic look.

Detail report of Innovation/solution:

HT Metering Cubicle(HTMC) is a weatherproof enclosed compartment for CTPT unit for HT Consumers Consist its Protection switchgear, Metering Compartment, and other accessories.



Field study report : In Sanand BOL-GIDC under UGVCL, the entire network of HT consumer has been made underground and the connections are made with the HTMC. The performance of HTMC is found encouraging. The failure rate of CTPT, in major cases the failure, if CTPT inside the HTMC are due to the external stud failure of CTPT and no internal faults defect. in the GIDC is just below 1.5 to 3.5% with zero interruption as the effect of environmental and peripheral parameters having been eliminated, pilfer proof installation, zero accident with improved customer satisfaction level.

How does new innovation help to overcome Limitations of the present system:

The merits of the HTMC system over the conventional outdoor type overhead CTPT installation system.

- The operation of the HTMC is quite easy with respect to the overhead system. Isolation in case of HTMC is very fast and at the fingertips, and requires single operation; whereas in case of the overhead system it is in three steps, as the DO fuses are put off by sequential operations.

During the handling of the DO Fuses, there are chances by the swing of the DO fuse elements, it may touch the MS parts of the structure leading to an accident or power supply interruption.

- In HTMC, the interlock is provided between the operation of LBS and earth switch. This gives an extra stitch of safety for operation as well as the functioning of the entire system and the operator.
- The HTMC provides a smooth mechanism for replacement of CTPT unit as it is done by trolley transfer method. The handling is easy and it does not require the extra appliances like chain pulley block. It, even, shortens the time for the replacement of CTPT.
- The HTMC with LBS provides accurate protection by virtue of HRC fuses/ VCB against overhead DO fuses.
- The HTMC is installed on a well-constructed plinth. This provides an easy access point with respect to overhead lines. The operator is facilitated for the operation of the HTMC.
- The HTMC is solidly earthed with the standard earthing system. This enhances the life and safety of the CTPT, human and animal as well. In fact, the solid earthing of the CTPT body is the mandatory condition. Whereas in case of the overhead line the same gets deteriorated with the passage of time. This also affects the functioning of CTPT, in case of the O/H system.
- In the case of HT installations, energy meter is installed just below the CTPT unit. This may create a very dangerous situation for the staff engaged in testing and vigilance activities. Certain cases are on record where the outdoor CTPT have exploded and caught fire, causing the accident to the staff on duty or outsiders, which will be completely eliminated in case of the HTMC.
- As viewed from the images of the HTMC, it is revealed that it gives the aesthetic look for our highest revenue generating HT consumers, safety, power supply reliability and pilfer proof installation, as well.