

## Basics of OLTC of transformers.

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1. OLTC at distribution Substation Transformer is the only better solution when it is required to control low or especially higher voltages at downstream power distribution ends since capacitors are very much prone to resonance due to harmonics and switching transients.

An advantage of capacitors over either OLTC or stand-alone voltage regulators is the feeder current and losses will be reduced.

We employ both in our substations. But optimum utilization of OLTC lie only in the hands of the SS operators. Hand cranking the OLTC on an energised transformer might be one's last blunder and avoiding extreme tap position is safer one.

2. OLTC almost has +15.0% and -3.75% voltage regulation limit.

Rated voltage, rated current and rated step voltage of OLTC should match with the maximum values of transformer.

3. Minimum protection viz. pressure relief device (fitted in the arcing chamber, optional), surge relay (mounted between the diverter chamber and its oil conservator) and out of step relay are provided in OLTC to detect any excess surges from faulty diverter switch.

4. All the EHV OLTC have separate diverter switches which is the load-making and load-breaking switch element of the tap changer.

The oil in the diverter tank is (relatively) dirty and contaminated by arcing breakdown products, and is in a separate compartment from the core and windings and hence monitoring of OLTC oil shall also be periodically monitored and action taken accordingly. If any problem occur in transition resistor provided in the diverter switch and in arcing contacts slight hissing noise can occur in OLTC which could be observed with close and keen monitoring or even by using a good Stethoscope. If noise observed, DGA of main tank oil and OLTC chamber oil shall be conducted and proper action

taken.

The arcing contacts of diverter switch should be changed after the stipulated number of operations as per the OLTC OEM's manual. There may occur minor problems with the drive mechanism, but better lubrication and proper maintenance will avoid these difficulties.

5. Top mounted OLTCs are common but a lifting frame or gantry is to be provided to remove it for maintenance.

A high voltage OLTC is a substantial sized one but is also a delicate piece of precision engineering and removing it and replacing it in the tank is not an easy job. Hence, it is always better to plan and engage suitable manpower.