

On Load Tap Changer Condition Assessment

DRM - Dynamic Resistance Measurement

- DRM graph pinpoints exact location of defects
- Complementary to DGA method
- Our data base contains over 15 000 DRM files
- Analysis of resistive, reactor and series transformer OLTC types

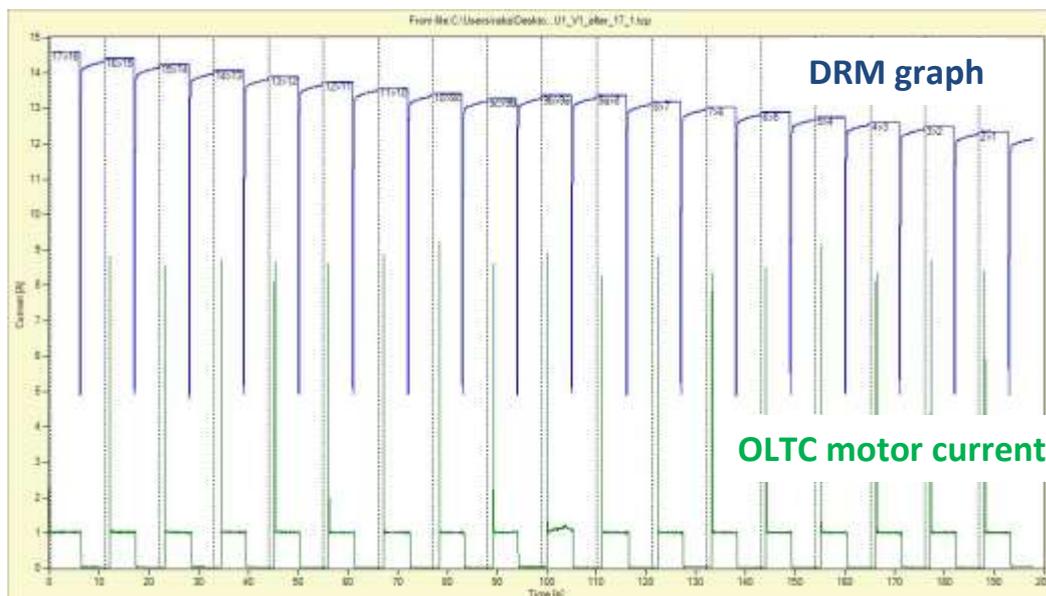


About DRM method

The Dynamic Resistance Measurement – DRM method (also known as DVtest method) is an off-line, non-destructive testing method based on a dc current being injected through a winding and a tap changer as it moves through all of its positions. Also, an on-load tap changer (OLTC) motor current can be recorded simultaneously with the test current. DVtest provides certain information about an OLTC condition without the OLTC removal from the main tank, which is an expensive and time consuming job. The

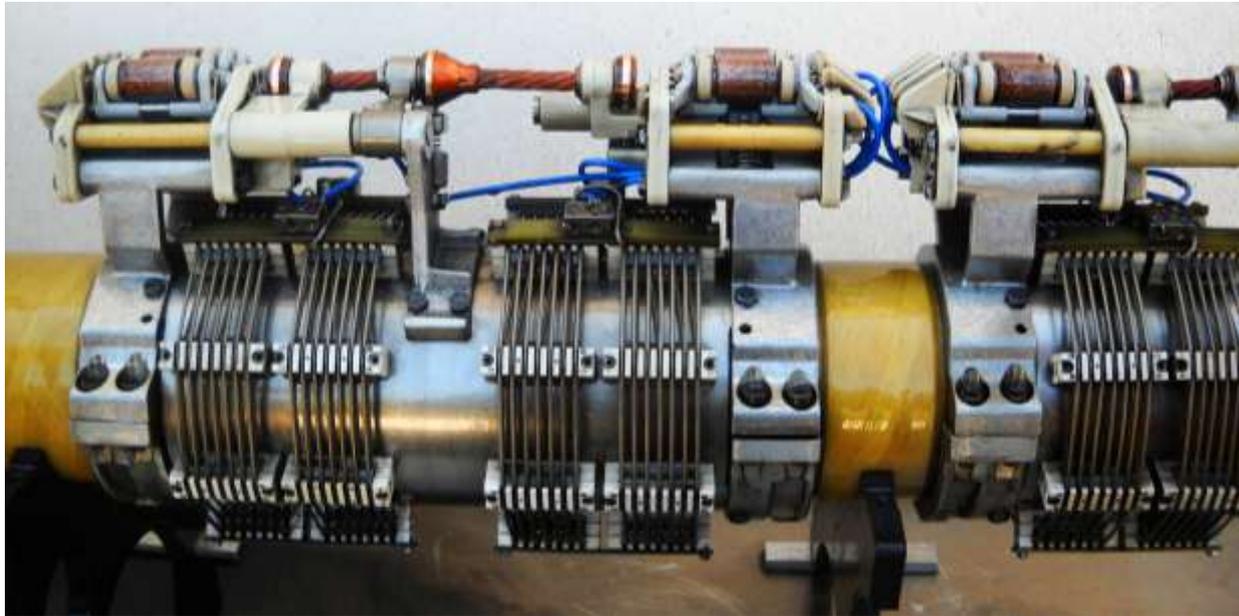
DRM graph pinpoints an exact location of defects indicated by a high level of gasses, or the Buchholtz operation causing tripping the transformer out of service. This method is complementary to DGA (Dissolved Gas Analysis) method.

The DVtest graph irregularities can indicate the OLTC problems such as contacts, mechanism, energy accumulator, and motor problems. All of them being dynamic problems, they are not visible when testing static winding resistance.



Interpreting DVtest graphs

There are different variations of OLTC models. Performing a reliable, trustworthy OLTC analysis requires understanding regulation principles of the OLTC operation. Each type of a tap changer belongs to a group of units operating in a similar manner. Every operating method provides a different graph and requires a distinct analysis technique. DV Power supports performing detailed OLTC analysis on resistive and reactor types as well as on OLTC with series transformer included.



DV Power experience

DV Power is the market leader in applying the DRM method. Conducting intensive testing, collecting results and delivering professional result analysis have been provided as consulting support since 2007. Vast practical experience with more than 15 000 DRM files collected from more than 40 countries secures the most accurate device status diagnostics by comparing test results with previously collected reference data. DV Power results library contains fingerprints (reference graphs), failed OLTC operational situations data and test results obtained from tests before and after performing maintenance services on majority of OLTC types in operation today.

To standardize this method and data analysis procedure the IEEE organization established the Task Force within its IEEE Transformers committee in 2017.



DV Power offers service that includes:

- **Consulting service - OLTC testing and maintenance**

DV Power can suggest and share its experience on different OLTC testing methods. The advantages and disadvantages of certain methods will be illustrated and explained. Many technical papers and research projects about DVtest methods are available to share.

Consulting service includes:

- DVtest application guide,
- Establishing and collecting fingerprint test results,
- Guidance on additional test procedures.

- **Creating professional test report**

The report contains detailed DVtest results analysis which includes:

- OLTC and its auxiliary circuits analysis,
- comparison with the similar units from the DV Power results library,
- comparison of prescribed OLTC operation sequences
- checking if timing is within the OLTC manufacturer defined limits
- DV Power OLTC condition assessment and recommendations for additional action

