




DVpower 
DV Services
Education & Training
Results Analysis
Field Testing

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RESULTS ANALYSIS & CONSULTING



Introduction

Substation maintenance consists of routine procedures, where sometimes unexpected results can occur which are caused by incorrect measurements, wrong results interpretation, faulty instrumentation, faulty test object, or some other factors.

Our experts can help with an interpretation of test results obtained from devices of the world's leading manufacturers and make condition assessment of tested object.

Our Services

- Test results analysis
- Professional test report creation
- Condition assessment services
- DV Power fingerprint results library
- Expert consulting services
- Assistance during measurements

Results analysis and test report creation

Power Transformers

On-Load Tap Changers

Current Transformers & Voltage Transformers

Circuit Breakers

Battery Systems



Global Experience

Our customers provide us with continuous case studies feedback and therefore we have results collected from more than 90 countries. Thanks to the results database and our practical knowledge, we can provide professional results analysis.

DV Power Library

Valuable and comprehensive benchmark data, collected during the years of extensive field testing, will help to evaluate test results on your equipment.

- Over 2 000 tested transformers
- Over 200 tap changer types tested
- Over 400 circuit breaker models tested

Unbiased Expert Opinion

Unbiased diagnosis and assessment of critical assets are crucial for getting the answers to your asset condition problems.

Test Instructions

Test preparation instructions

- Test instructions according to nameplate
- Selection of proper test parameters
- Test sequence optimization

Expert Consulting Services

DV Power consulting services enables limited maintenance budgets to be directed toward critical equipment, as well as to design effective maintenance programs, and improvement initiatives.

We can assist you with an audit of the maintenance procedures, evaluate the procedures, and recommend needed improvements.



Test execution instructions

- In case of doubts or incorrect results
- Issues with unexpected values
- In case of troubles during investigation

Condition Assessment Services

The initial step of a condition assessment service is based on assessing the actual physical condition of the asset and takes into account its usage, abnormal event records, possible wear of moving or current switching parts, and the performance of similar equipment.

This data will give an overview of the equipment condition and provide a basis for additional investigations.

Power Transformer and On-Load Tap Changer



A transformer condition assessment is of crucial importance for each owner. Decision-making is performed not only according to the last obtained results. Important facts are also analyzed such as the transformer historical review, a failure developing diagram, the importance of the transformer in the system, operating conditions, etc.

Analyzed results indicate if the transformer is in good condition or if intensive monitoring is required or if the transformer repair is mandatory.

Power transformer analysis service covers:

- DC winding resistance test
- Turns ratio test
- Tan delta (power factor) and capacitance test winding insulation
- Tan delta (power factor) and capacitance test for bushings
- Sweep frequency response analysis
- Excitation current measurements
- Leakage reactance test
- Insulation resistance test



OLTC analysis service covers:

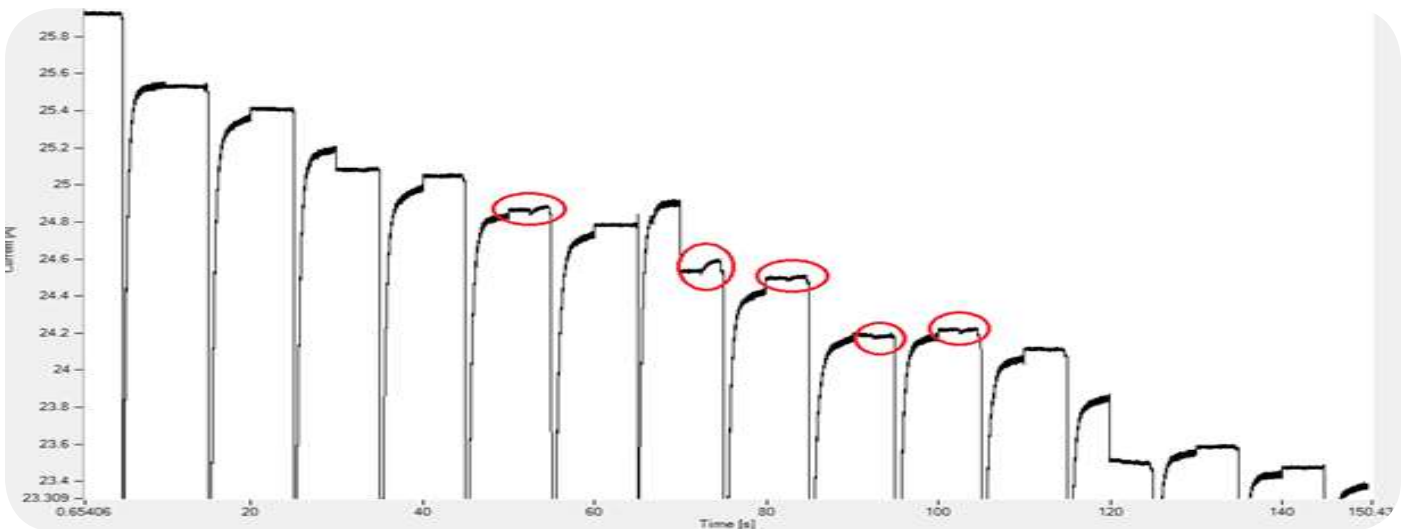
- Oil quality analysis, based on standard lab test results
- Oil DGA evaluation from main tank or tap changer
- Detailed OLTC analysis by using dynamic resistance measurement test (DVtest)
- Resistor and reactor OLTC types:
 - analysis of contact condition
 - analysis of mechanical parts linkages
 - analysis of OLTC's motor operation
 - analysis of diverter switch

DVtest (DRM) Analysis

OLTC condition investigation using a new diagnostic tool for OLTCs condition assessment – DVtest (Dynamic Resistance Measurement). DVtest feature enables measuring and recording the test current at high sampling rate during a tap changer transition. The variation of the current represents the change of the resistance in the circuit during the change of tap

positions. A standalone instruments detect any open circuit during the tap changer operation.

This test may be used to detect problems such as slow transition time, open circuits, problems with contacts, transition resistors, mechanism, energy accumulator, motor control, and much more.



Laboratory Services

DV Power cooperates with independent analytical laboratories and consulting firms specialized in diagnostic testing of oil, gas and other insulating materials used in transformers, power circuit breakers and load tap-changers.



Forensic Analysis

Forensic analysis includes operating and maintenance records review, oil analysis, on-site inspections and tests, and infrared analysis. In combination with DV Power Resource Library, the explanation of mechanism failure and root cause are documented in detailed reports.

High Voltage Circuit Breaker

Test preparation and analysis of the test results are the most important part in the process of the circuit breaker diagnostic. The aim of testing is to get results and based on the results analysis to assess whether a

circuit breaker is in good condition or not. Condition assessment is done using our theoretical and practical knowledge, and large database containing manufacturer defined threshold values.

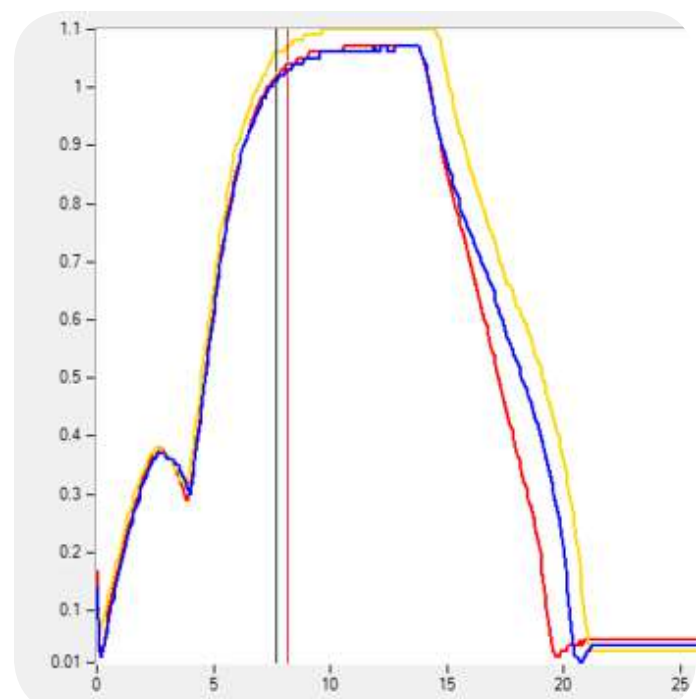


Circuit breaker analysis service covers:

- Timing tests results
- Main contact resistance measurement
- Dynamic resistance measurement (arcing contact condition assessment)
- Motion and velocity curve
- Coil current waveform
- SF6 gas analysis
- Vacuum integrity test

Methods for results analysis:

- Numerical results comparison and analysis
- Graphical results comparison and analysis



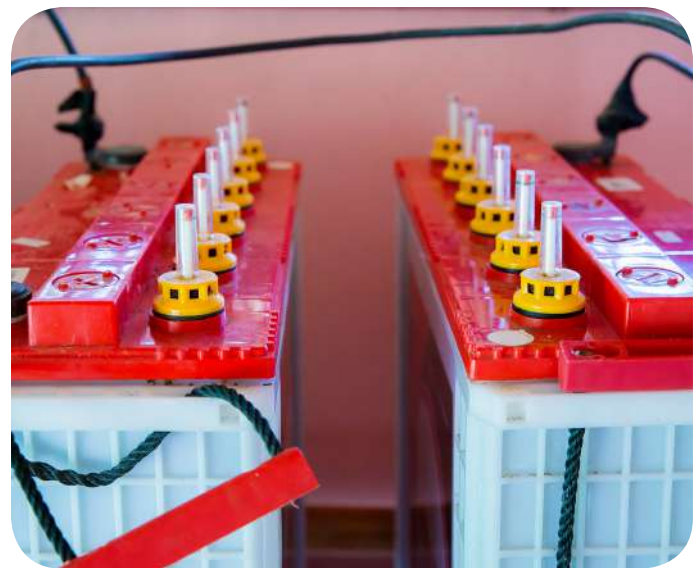
Battery System

Improper functioning of battery systems installed in utilities, power plants, telecommunication systems, industrial applications etc., can cause severe failures of the supported equipment and loss of critical information. The wide range of DV

Power battery testing services verifies the battery's SOC (state of charge) and SOH (state of health) and prevents unwanted scenarios which could result in a significant budget loss, or even worse, endanger human lives.

Battery analysis service covers:

- Analysis of the obtained results
- Battery performance prediction, and service life estimation
- Detailed capacity test result analysis
- Suggestions for cell replacement
- Internal resistance results analysis
- Quarterly maintenance procedures (float voltage, float current, temperature, and inter-cell resistance analysis)
- Common battery failures analysis: plate sulfation, grid swelling, corrosion, thermal runaway, plate shorts, etc.
- How to increase battery's service life



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