

ABB's latest development the TrafoSiteTesting™ mobile test unit is a Mobile High-Voltage Test System for On-Site Testing of Power Transformers. Worldwide, it is the first 3-phase Mobile High-Voltage Test System for Power Transformers based on a static frequency converter which is especially designed for performing routine and special tests according to standards as IEC 60060-3, IEC 60076 and IEEE Std. C57.12.00.



### Introduction

Supplemented by the most common diagnostic methods used under field conditions, the Mobile High-Voltage Test System enables ABB to offer a full range of testing on all types and brands of transformers from small grid transformers up to the largest step up generator transformers.

### Why should transformers be tested on site?

With TrafoSiteTesting™, ABB proves the proper condition of the equipment, giving accurate and reliable test results as is known from acceptance test in a static test field in a factory. As an enhancement of ABB's TrafoSiteRepair™ concept, the Mobile High-Voltage Test System opens new doors for condition assessment. Informed decision-making is fundamentally important. Values measured with the Mobile High-Voltage Test System and diagnosed and evaluated by ABB's experts who have access to more than a century of knowledge in transformer manufacturing, is the basis for the optimal solution. Accurate information allows prioritizing service work in a way that ensures maximum economic benefit.

### TrafoSiteTesting™ can be used:

- After a TrafoSiteRepair of a transformer
- After a failure for diagnosis and fault detection
- For condition assessment on high-valued, important and critical units during maintenance shut-downs

- Before the commissioning and energizing of spare transformers
- After shipment of repaired or new transformers

### Which tests can be applied?

To assess and verify that the overall condition of a transformer is reliable and fit for operation, several tests and diagnostic techniques can be applied:

#### High-Voltage Test:

- Applied Voltage Tests in a resonant circuit up to a test level of 500 kV
- Induced Voltage Test (single- or three phase) up to a test level of 90 kV.
- Electrical and Acoustical Partial Discharge (PD) measurements
- Measurement of no load losses
- Measurement of load Losses with external compensation up to 150 MVAR @1,3 MVA

#### Electrical Routine Test:

- Transformer Ratio Measurement
- Winding Resistance
- Short-Circuit Impedance

#### Dielectrical Test:

- Insulation Resistances
- Loss Dissipation Factor and Capacitance of transformer and bushings
- Frequency Domain Spectroscopy (FDS)

### Additional Test:

- Frequency Response Analysis (FRA)
- Thermo vision scan
- Sound measurements
- Full range of oil testing in own laboratory

### Which preparations are necessary?

To ensure a smooth workflow the following needs to be prepared prior to testing:

#### Test object

The transformer needs to be:

- switched off and completely disconnected
- fully assembled
- equipped with HV-bushings with measurement taps for the PD-measurement and located at a place with sufficient clearance e.g. transformer foundation

#### Dimensions and the storing position of the Mobile Test System

The Mobile Test System is installed in a modified 40ft container with the following standard dimensions:

- Length: 12 - 19 m (16 m during testing)
- Width: 2.35 m
- Height: 2.59 m
- Total weight: 27 tonnes

The transformer location must be accessible by truck.

Maximum distance to the test object is 25 m. The Mobile Test System must be placed on suitable ground.

#### Power supply

A stable 400 V/550 kVA supply is needed to operate the Mobile High-Voltage Test System. The power can be supplied either from a diesel generator or a distribution network. The distance to the power supply must not exceed 100m.

#### Tools & Equipment

A personnel hoist should be available to ensure safe access to the top of the bushings.

### Customer Success Story

- A 30 year-old Generator Step-up Transformer (315 MVA, 400/21 kV) was kept as a spare unit, being out of operation for more than 5 years
- Owner needed to use the spare unit because existing transformer in service became critical due to an internal hot spot
- Owner did not know if he could rely on the condition of the spare
- The ABB Transformer Service Center serviced the transformer on-site and performed a high-voltage test to proof the condition prior to energizing

### Recognized benefits:

- ABB's TrafoSiteTesting™ solution ensured that the owner would energize a transformer in good condition for safe and reliable operation
- Owner avoided having to pay penalties for non-delivery of energy due to failure of critical equipment;
- Overall satisfaction of the owner and of the end-users.



### Conclusion

ABB is the global leader in TrafoSiteRepair™ and, with its globally coordinated and quality assured processes, the partner of choice when customers opt for quality-secured repairing and state of the art testing of transformers on site using TrafoSiteTesting™.

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