

3.17. MOBILE DIAGNOSTIC LABORATORY FOR POWER TRANSFORMERS AND SWITCHGEARS

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In Russian power industry, more than 50% of installed transformers have worked out standard operation time. However, their replacement in existed conditions is impossible. In order to decide whether to operate a transformer further on, necessity appears to determine its actual technical state, which is defined by the large variety of parameters featuring the state of active part, insulation, tap switching unit, high-voltage inputs, etc. Instrument to carry out such studies is mobile diagnostic laboratory for power transformers.

Laboratory is intended to perform the complex of works on testing and diagnostics of power transformers and high-voltage inputs in accordance with requirements of RD 34.45-51.300 “Volume and standards of electric equipment tests”:

- measurement of insulation parameters of windings and inputs;
- measurement of winding resistance by direct current;
- measurement of standby losses;
- measurement of short-circuit resistance;
- verification of transformation ratio;
- verification of windings connection group;
- insulation testing by increased voltage of industrial frequency.

Data of measurements and tests are recorded automatically in tables and test report. Transformer state is evaluated by operator.

Diagnostics of the transformer technical state allows the following:

- To prevent in timely manner occurrence of emergency situations related with faults of transformers and switchgears; to improve reliability of equipment operation;
- To reduce significantly expenditures for repairs with improved efficiency of their performance;
- To evaluate actual state of electric equipment and to determine its stamina (reserve time of operability), which is of special importance for transformers that have worked out 15 years and more;
- To prepare for commissioning of the continuous diagnostics (monitoring) systems and determination of remaining service life of equipment in composition of automatic process control systems within power facilities.

More than 20 laboratories of indicated type are produced for JSC “Mosenergo”, RAO “PJF”, building complex of Moscow City.