

What is “DualGround” testing technology and why should you use it?

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With the ongoing deregulation of the electric power industry, utilities and service companies are operating in an ever changing business environment. There is expectation of increasing profitability with fewer and fewer key technical resources.

Further, companies are judged by the public on their overall safety record. The health and safety of personnel undertaking high voltage testing has become highly visible with Trade Unions and media watching their activities carefully, while at the same time critical skill sets required for many maintenance jobs have been decreasing. Keeping HV test engineers safe has never been more important.

The Importance of Proper Grounding when Testing Circuit Breakers

Regulations and laws require all objects to be grounded on both sides of a circuit breaker before any maintenance work is performed on that breaker. With the average experience of personnel performing circuit breaker testing decreasing in recent years, the education level and experience reduction of personnel has led to an inability to follow complex safety procedures and now requires extensive field training.

It can even lead to insecurity that tests are being executed in a correct manner.

Also, such instances as electric arc flash and electrocution accidents in substations are due to fault currents, lightning on power lines connected to the substation and capacitive coupling within the substation. The outcome of accidents spans from short-term hospital visits to much worse.

This risk appears because a test on a circuit breaker is performed without proper safety grounding. The risk for an accident can be regarded as low, but the impact could be catastrophic and usually covered by everyone from the media to OSHA.

The most important test for circuit breaker diagnosis is the main contact timing and contact resistance. Main contact timing and contact resistance requires an instrument connected to the circuit breaker on site. Conventional instrumentation technology knowledge implies that the safety grounding can be removed during the test. This immediately means it is not in compliance with certain standards mandated by trade unions and the government. Safety bodies, like HSE and OSHA and their counterparts in other countries, have guidelines prescribing that circuit breakers need to be grounded at both ends during any maintenance work. This makes the test proceed very inefficiently from a personnel and asset management point of view. Also, because a safety ground is removed, it leads to extensive safety precautions being added to the way the work is performed. A special work permit has to be acquired in the field that is typically granted by remote office personnel.

Field personnel attempt to avoid removal of safety grounds for testing by disconnecting and isolating the grounded incoming line drops from the breaker. Not only does this add expensive labor hours to the job, this leaves the breaker totally ungrounded and susceptible to capacitive coupling.

Introducing “DualGround” Testing

Dual grounding incorporates grounding of a breaker on both sides after it has been removed or taken out of service. When HV breakers in live substations are removed from the system the effects of the induction from adjacent, live overhead lines can create hazardous voltages on any un-grounded equipment and erroneous results from connected test equipment. Typical substation procedure includes the breaker being initially grounded on both sides, and then one side being removed or temporarily lifted while testing is taking place. The DualGround testing technology allows the breaker under test to remain grounded while testing is being performed, without any impact to the test results as they are obtained.

As a result there are significant benefits derived from performing dual ground testing, as follows:

1. Allows personnel to work safely between safety grounds
2. Test results are not affected
3. There is no need for a standby bucket truck and crew
4. There is no waiting time between tests
5. Hazardous voltages are negated
6. The number of work permits are reduced
7. Productivity is improved since actual testing time is reduced

What equipment provides “DualGround” testing capability?

Megger offers a 200 Amp microhm meter called the MjÖlner 200 and a Circuit Breaker Analyzer called the TM1800 which both provide the DualGround testing technology. Look for the DualGround logo in the literature as well as on the instruments themselves.