



Technical Article

Ground Resistance - Should I be checking ground resistance?

Imagine, while constructing a new chemical storage tank next to existing tanks, you uncover decomposing ground rods that are potentially compromising the safety of people and equipment of your manufacturing facility. You know at the time of installation that ground resistance was tested and verified. But *when was the last time the ground resistance was checked -- in 1970 when the plant was built?*

Ground resistance testing is the single most critical aspect in electrical grounding design. Over time, soil conditions and environmental factors can change, causing an increase in the resistance of the safety ground connection so it is especially important for aging industrial facilities to periodically test their earth resistance systems. Too often the resistance of existing systems goes unchecked after initial installation. In fact, any plant or facility, not matter its age that uses a significant source of electrical power, connected to the earth, should make testing ground resistance a routine part of predicative maintenance programs.

Conditions that can interfere with ground resistance may include:

- Breaks in interconnecting wires
- Ground moisture issues
- Corrosive soils
- Changes in topography
- Lightening and power surges
- Electrical "noise" from computer-controlled systems
- Expanding the structure of the building

So how often should you test ground resistance? The American National Standards Institute (ANSI) and the InterNational Electrical Testing Assessment (NETA) recommend a minimum of once annually, but other guidelines suggest testing seasonally or an odd month interval basis (every 5, 7 or 9 months) as grounding can be stressed by changing weather patterns. Because temperature, moisture content and salt levels affect the resistance levels in soil, testing at odd months gives you "best" and "worst" case ground conditions.

While the basic necessity to measure ground resistance hasn't changed much in the last few decades, the tools and efficiency have. Stakeless, or clamp-on ground resistance testers make testing much easier than traditional methods like Fall-of-Potential, because they can safely measure resistance without disconnecting the ground and don't require auxiliary grounds rods or reels and can be performed from almost any location. The new REED digital Earth Resistance Clamp (MS2301) simply clamps around the ground cable or rod and measures the resistance to ground by generating a voltage through one clamp and measuring the current through the second clamp. It is highly sensitive and can

measure the leakage current to 1mA, neutral current to 20A RMS and stores up to 99 resistance measurements at a time. Devices like the REED digital Earth Resistance Clamp uses advanced technology to provide alternative methods for accurate, efficient, ground testing that can save your plant time and money.

Whether it's deterioration in ground rods or corrosive soil challenges, environmental changes will inevitably affect the quality and performance of an aging electrical system. That's why it is critical to test your ground resistance on a regular basis to minimize risk to people and equipment, and increase performance from the ground up.

Tips:

- DO NOT do a ground resistance test after a major rainfall or you'll get a false favorable read.
- DO NOT open transformer enclosures. They may be the property of the electrical utility.
This test is for high voltage experts only.
- DO wear rubber gloves while handling connections.
- DO stand or sit on a rubber safety mat while performing the test.
- DO consult a high voltage expert when in doubt.

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