

Introduction

Power Cable Diagnostics is a unique practice in the energy industry. Many utility or industrial customers do not proactively test power cables to enable repair/replacement decisions and improve system reliability. One reason for the lack of testing as a standard maintenance practice is that the traditional method of hi-pot testing is considered a destructive test that can actually cause a cable to fail. Subsequently, many customers have taken the approach of just waiting for cables to fail. As a result, they do not realize the significant cost savings that non-destructive power cable diagnostics can deliver by being proactive versus reactive.

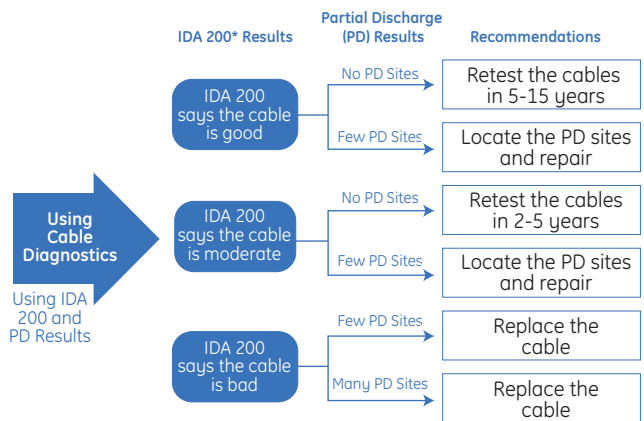
GE Energy's non-destructive diagnostic technology measures the overall health of the cable, locates the existing cable defects with unsurpassed accuracy, and predicts the future life expectancy of the cable. This helps our customers be proactive in preventing costly forced service outages while optimizing their capital budgeting for replacement programs. GE Energy's unique Power Cable Diagnostics service is specifically designed to help our customers increase their reliability, improve their profitability and reduce risks by doing a comprehensive test of power cables. This offering applies to medium and high voltage shielded power cable (5 kV to 500 kV class) with a maximum length of 1.5 to 2 miles. The cables to be tested can be overhead, in cable trays, in duct bank, or buried.



Service Description

GE Energy's Power Cable Diagnostic service can usually test three to four, 3-phase cables per day. Initial test results can be provided at the site with a detailed actionable report soon after. Since initial test results are immediately interpreted by skilled resources, the customer can take corrective action during the outage prior to re-energization of the circuit. GE Energy can also provide overall project planning for a comprehensive cable testing program and can break and re-make the cable connections if required. Our expert service team members conduct two different tests on the power cable: a general condition assessment and partial discharge testing. The general condition assessment test utilizes the GE Energy IDA 200* insulation diagnostic system, which is based on the principle of dielectric spectroscopy (DS). The off-line partial discharge testing measures the extent of damage and locates the "defects" or partial discharge sites. GE Energy will then combine the two different test results to present a comprehensive recommendation for each cable.

Typical GE Energy Test Recommendations



Applications for Power Cable Diagnostics

Common areas where power cable diagnostics services can be applied are:

- Verifying original manufacturing test data before commissioning a new cable.
- Detecting bad splices, poor connections or damaged insulation after installation.
- Testing and performing pro-active repairs on critical cables during plant shut downs.
- Prioritizing repair/replace decisions of unreliable cables during asset management programs.
- Testing cables, that have been out of service for long periods of time, for potential moisture issues.
- Identifying potential corrective actions for repetitive high failure incidence issues.

Key Features

- Provides high quality assessment of the present condition and predicts future performance of the cable.
- Replicates calibrated factory baseline tests, steady state and transient conditions.
- Unique offering of a preliminary report on-site to support outage activity.
- Leverage off-line partial discharge testing, which is more efficient at finding areas of concern than on-line partial discharge testing.

Differences between On-Line and Off-Line PD

On-line PD	Off-line PD (GE Energy uses this method)
Cable does not need to be switched out of service	Cable must be switched out of service
Will detect and locate - Severe accessory defects - 3% of near term cable defects	Will detect and locate - Near/long-term accessory defect - Near/long-term cable defects
No IEEE standard	IEEE [†] standards
Cable length must be less than 500ft per access point	Limited to between one and to two miles of cable per segment
<ul style="list-style-type: none"> • Test sensitivity not calibrated – test quality is an unknown value • Large scale correlation data not available 	<ul style="list-style-type: none"> • Replicates calibrated factory test • Large scale correlation data shows (field/lab) 83/94% correlation

Benefits

- The most comprehensive non-destructive service converting data into actionable recommendations.
- Optimize capital Maintenance Repair Operations (MRO) expenditures up to 20%.
- Improves network or power distribution system reliability.
- Administered by an experienced team with thousands of miles of testing experience.
- Only service provider to offer both general condition and partial discharge solution.



For more information about this product, contact your GE Energy sales representative, visit gepower.com or email us at automation.solutions@ps.ge.com.

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