

the electrical digest

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Partial Discharge Analysis - Predicting Insulation Failure

Large Motors and Generators

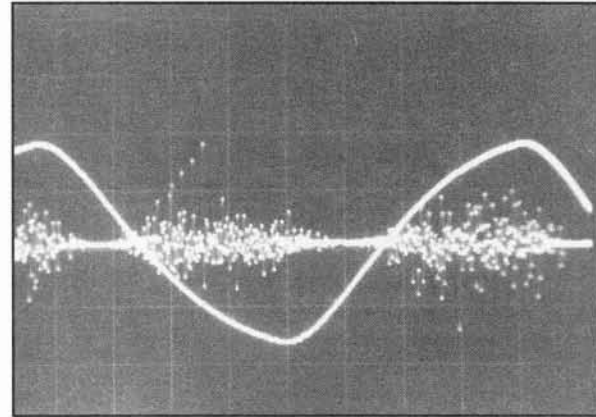
High voltage windings of large motors, generators and turbo-alternators can eventually fail due to insulation deterioration and mechanical abrasion in the stator slot. Partial Discharge Analysis (PDA) is a convenient, economical, and non-destructive in-situ diagnostic procedure for assessing the condition of insulation systems rated 6.9 kV and above. Remedial action can then be taken before serious breakdowns occur. Typical machine sizes are from 3 to 50 MW (4,000 to 50,000 hp).

For insurers, insured, adjusters, lawyers and claimants the PDA test is an important diagnostic tool for assessing the condition of motor and generator insulation after a failure, flood, fire or other peril.

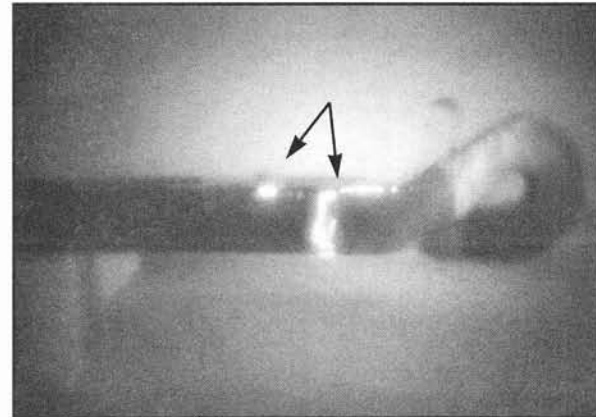
Utilities have been using the procedure for almost 20 years as a diagnostic tool to test hydraulic generators. PDA is also a recommended maintenance insulation test for machines worldwide.

Brosz and Associates, electrical power system specialists, now provide this advanced technology as an additional service to its customers. Using a portable version of the equipment PDA tests can be conveniently performed during regular plant shutdowns.

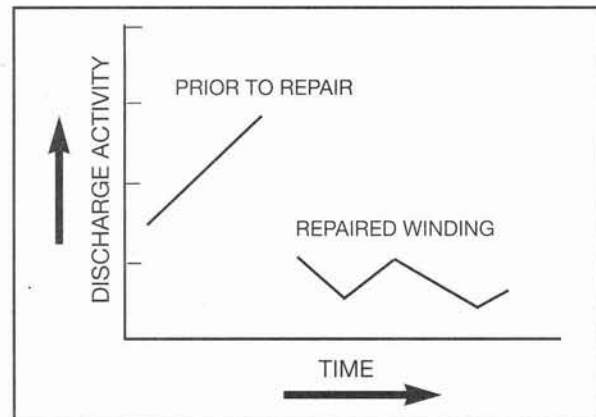
New rotating equipment can also benefit from PDA in that the "finger print" obtained during commissioning is a valuable bench mark in assessing subsequent insulation integrity, warranty and insurability issues. We find that an annual testing program is an effective method of identifying potential catastrophic insulation breakdowns.



Typical high frequency discharges detected by the Partial Discharge Analyser. The higher peaks, the greater the extent of the insulation deterioration. A 60 Hz power frequency sine wave is shown for comparison.



Light amplified image of faulty winding removed from a machine showing localized area of corona-stressed insulation under high voltage PDA testing.



Extra machine life obtained from winding repair.

Affiliations & Memberships

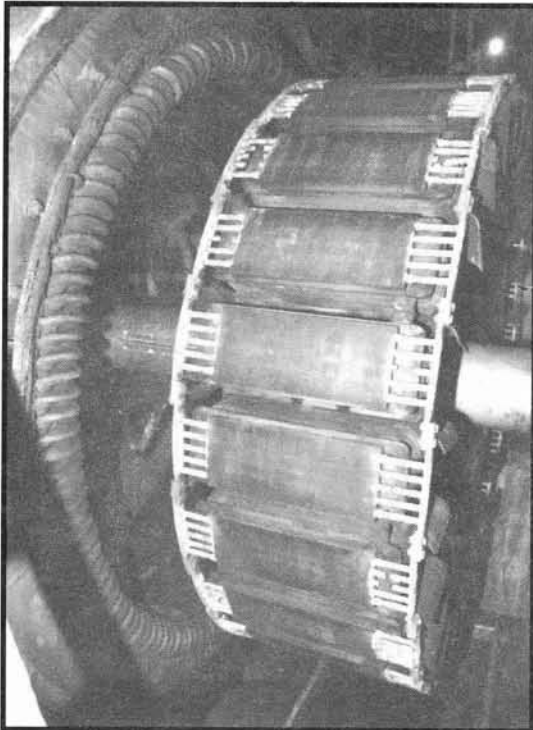
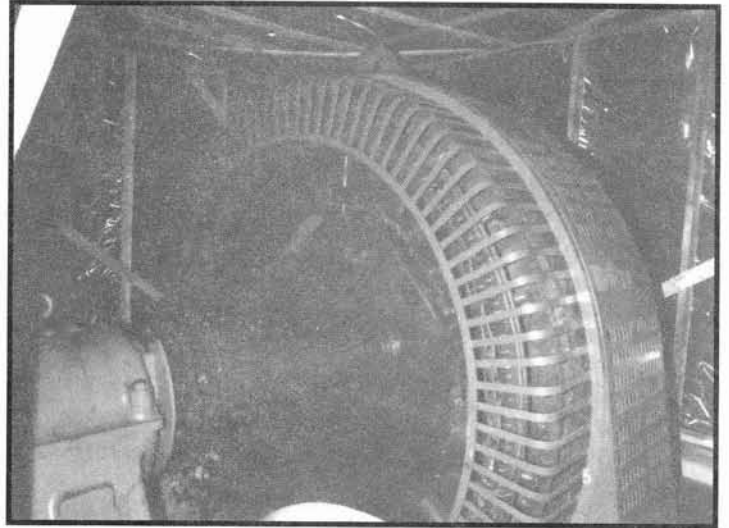
- AAFS
- CSFS
- NFPA
- IAAI
- APEO
- OEL
- CFAA





1350 KVA generator being inspected after a flood.

5000 KVA generator undergoing insulation condition assessment after flood.



Grinder motor- 7500 HP, insulation being assessed using PDA with rotor withdrawn from stator.