



CABLE DIAGNOSTICS & TECHNICAL SERVICES

Another sense on your cable



Trust by diagnosis

Breakdown of insulation causes critical damage to equipment and connected system during operation and results in over-voltage, fire, fault current, explosion, damage to equipment and property, personnel injury and fatal accident.

The reasons of insulation breakdown are electrical and mechanical damage, cracks, contamination, moisture and humidity, corrosion, vibration, localized high-temperature, partial discharge, tracking, electric and water tree, ferroresonance, un-qualified testing, and manufacturing defect.

Periodic maintenance and diagnosis can provide valuable information about the condition of system and predict failure of the system.

LS Cable & System provides a wide range of diagnosis services for cable and power network system.



Cable Diagnostics & Technical Services

	MV cable	HV/EHV cable	HVDC cable	Submarine cable	Joint & termination	Link box	SVL	Busduct	Monitoring system	Earthing system	Support structure	Other equipment (CT/PT, Arrester)
Partial Discharge	●	●	●	●	●			●	●			
Tan δ (50/60Hz, VLF)	●	●	●	●				●				
Insulation resistance	●	●	●	●	●		●	●	●			
Electromagnetic field	●	●	●	●	●			●				
Contact resistance	●	●	●	●	●	●		●		●	●	
Fault location	●	●	●	●	●		●	●				
Local heating					●	●	●	●		●	●	●
Arcing phenomena					●	●					●	●
Corona					●							●
Engineering service	●	●	●	●	●	●	●	●		●		●

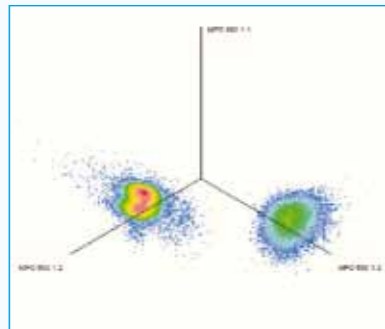
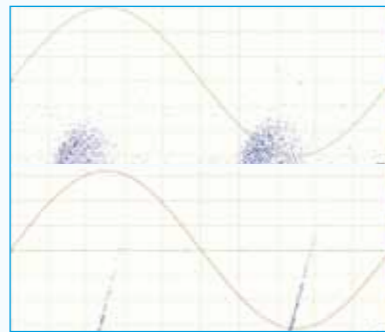
Partial Discharge



Localized defects of insulation system cause Partial Discharge. Electric trees which is made by Partial Discharge can lead to insulation breakdown.

Partial Discharge measurement is useful method to decide how much systems are degraded by electrical and thermal stress, manufacturing defects and installation errors in cable insulation system.

LS Cable & System have special technologies such as localization, noise filtering, monitoring, signal separation.



Insulation resistance measurement



When moisture and contamination exist in cable, insulation resistance becomes lower. It can lead to Insulation breakdown.

We can provide Insulation resistance measurement service in AC and DC cables



DC insulation resistance

- Step voltage test
- Time-resistance test
- PI(Polarization Index)

AC insulation resistance

- AC leakage current measurement

Fault location



When a permanent fault occurs in system, the faulted part should be removed from the rest of the system quickly to maintain the stability of the power grid.

It is important to accurately identify the location of the fault quickly to restore the faulted segment within the shortest possible time after carrying out the necessary repairs.

Detecting accurate fault location help minimize the outage time, and significantly reduce the lost revenues.

Technique

- TDR
- Murray loop
- LIRA
- Pin-pointing (Magnet & Acoustic sensor)



LS Cable & System has many experts of on-site Transmission & Submarine cables diagnosis.

Tan δ (50/60Hz, VLF)



Electrical potential energy is dissipated in dielectric materials, usually in the form of heat. Therefore measurement of Tan δ help determining condition of insulation systems.

LS Cable & System can provide Tan δ measurement in MV & EHV cable systems.

- MV cable : VLF Tan δ (Off-line)
- EHV cable : 3rd harmonic current (On-line)

LS Cable & System provide on-site measurement and monitoring service.

Harmonics measurement

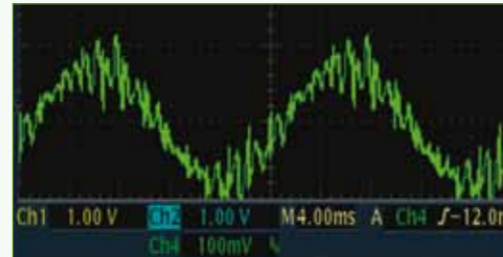


Harmonic voltages and currents in an electric power system are originated from non-linear electric loads, which lead to overheating and deterioration in the power equipment and cable system, mis-operating in relays and power control devices.

To retain the system optimally, harmonics should be limited according to standards. (IEEE 519, IEEE 61000 or utility standard)

Harmonics cause

- Generator & Motor output fluctuation and over-heating
- Cable over-heating
- Power Factor loss
- Noise, Vibration, Resonance, Explosion
- Relay & Circuit breaker mis-operation



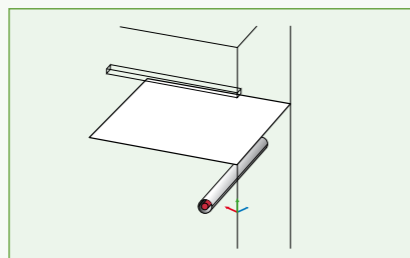
EMF & Local heating



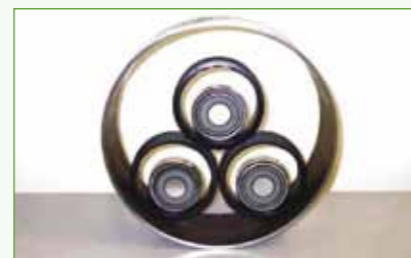
EMF is Electromagnetic field which is made by voltage and current. EMF may affect negative impact on human health. So it should be reduced by proper methods in residential area.



• FEM analysis

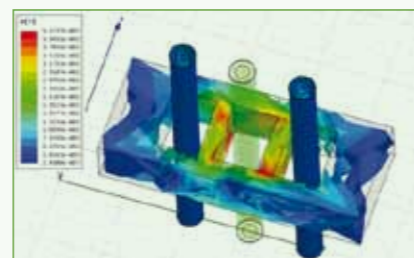
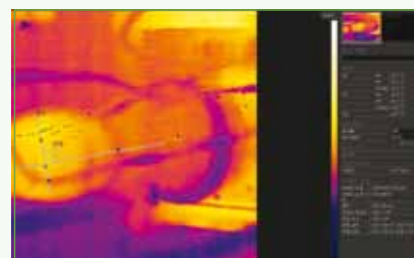


• Conductive shield



• Magnetic shield
[Source: CIGRE TB 373]

Local heating phenomena is occurred by circulating current and additional losses induced by EMF in the supporting structure, cable joint closure and contact part.



We provide the highest know-how & technique to reduce the harmonics, EMF, Localized heating on cable system and ancillary devices.

Engineering service



LS Cable & System provides optimized engineering service for existing and planned network based on the specialized technology of transmission and distribution cable system.

Cable engineering

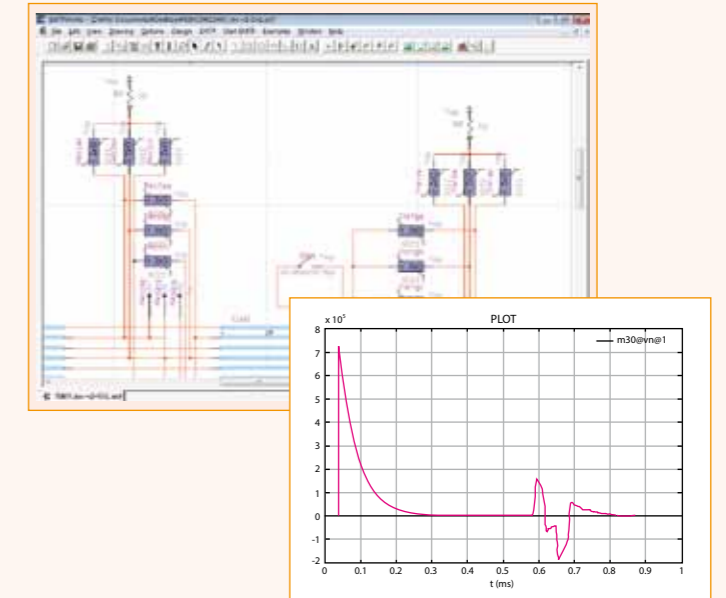
- Current ampacity
- Circulating current / Induced voltage
- Sequence impedance
- Unbalanced current

System analysis

- Load flow, Optimal power flow
- Fault analysis
- Lightning and switching
- Cable protection (SVL, Arrester)

Network planning

- Feasibility study
- Basic design



Lab test and Analysis



LS Cable & System provide evaluation and assessment services through electrical, chemical and physical analysis for existing cables affected by environmental and operational stress. It can help customer establishing cable replacement standards and asset management.

Electrical

- AC breakdown test
- Withstand voltage test
- Tan δ
- Partial Discharge

Chemical

- Water Tree
- TGA
- OIT
- EDS
- Hot-oil test
- DSC
- FT-IR
- Physical test

Visual inspection

- Dimension/Thickness
- Crack
- Corrosion
- Etc.

PFI (Power Failure Investigation)



LS Cable & System provide desk-top studies, site survey, failure investigation of Distribution and Transmission system for customer convenience on 24h/7day

We come at the truth by Diagnosis & Technical service



www.lscns.com

Cable Diagnostics & Technical Services

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