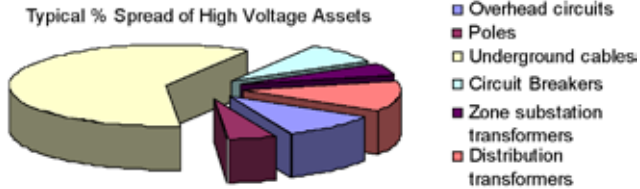


OPTIMISING UNDERGROUND SUB TRANSMISSION NETWORK CAPACITY

Using On-Line Partial Discharge Mapping

In most instances, underground cables form the greatest number of assets and combined value of an asset owner has, yet they are the least maintained unless a cable fault occurs. Very often the weakest link in a cable system is the terminations or cable joints, mainly because they require on-site assembly.

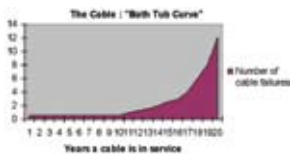


Cables do fail due to a number of factors such as the ingress of moisture and water into the joint, which can lead to catastrophic arcing failure of the joint; corroded sheath that lets water enter the insulation; overloaded; mechanical damage; and natural aging causing insulation properties to change state and lead to cable failures.

With above ground assets, the "eyes & ears" principle is usually used to make judgment on the condition of assets. With underground cable assets, for obvious reasons the 'eyes & ears' principle does not work and an On-Line Partial Discharge survey is the recognised method of evaluating the condition of your valued assets.

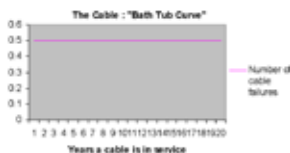
On Line Partial Discharge & "the Bath tube curve"

Definition: "The probability that a cable will perform its intended function during a specified period of time under stated conditions."



Using Traditional Techniques

For cable & switchgear management you run the risk of creating the bath tub curve = loss of supply / budget over run / risks to other sections of the network / loss of confidence with stakeholders



By using On Line Partial Discharge (PD)

in your maintenance program, it is possible to determine the condition of your assets and not get caught by the shape rise of failures in your cable population. Having accurate information on the condition of an asset allows the asset owner to make an informed decision.

It is now not acceptable to have an unplanned loss of supply due to aging cables. On-Line Partial Discharge Mapping is commercially available in the field by dedicated cable engineers and by having an On-Line Partial Discharge survey undertaken, it is possible to have a state-of-the-nation report on the condition of your cable and switchgear assets. (This is a must-do if you are purchasing any high voltage assets from another asset owner).

In the two instances below, PD identified faults that traditional methods of detection would not have found proving that On-Line cable mapping is the preferred method of testing High Voltage Cable Assets.



1. In-line 33kV joint
2. Heavy infestation of PD
3. If not found would have caused loss of supply to zone substation



1. Main contact bushing
2. Heavy infestation of PD
3. If not found would have put entire group of switchgear at risk of failure



ON-LINE CABLE PARTIAL DISCHARGE

DETECT AND LOCATE THESE FAULTS



Cables • Switchgear Generators • Motors Transformers

- Transformer Partial Discharge Inspections
- On-line and Off-line High Voltage Cable Testing
- Retention of Life in High Voltage Switchgear Audits
- High Voltage Switchgear Consultancy
- Factory Acceptance Testing for Clients
- High Voltage Asset Management
- High Voltage Electrical Inspections
- Insurance Investigations



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