First Field Experience of On-line Partial Discharge Monitoring of MV Cable Systems with location

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On-line PD testing mv cables

why?

- to find defects before failure
- on-line (long term) + no switching / safe
On-line PD testing mv cables how?

4 km
On-line PD testing mv cables how?

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Diagram showing sensors and possible locations for PD testing.
On-line PD testing mv cables how?

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Diagram: On a cable, there are 3 locations marked with sensors. One sensor is placed at the beginning, one in the middle, and one at the end. The cable is connected to a computer, indicating some form of data or signal transmission. In the inset, there is a graph with multiple lines, possibly representing electrical signals or PD activity over time.
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Diagram showing the placement of sensors and PD detection points.
On-line PD testing mv cables equipment

PD-OL - CU

PD-OL - SIU

← up to 4 km →
On-line PD testing mv cables equipment

sensor clamped around earthed screen of PILC or XLPE cable
On-line PD testing mv cables control centre

- users can watch PD development via internet (hourly updates)
- interpretation by KEMA specialists → uniform quality
- report (e.g. email) or warning (e.g. SMS) to utilities
- > 100 units in stalled in 5 countries
On-line PD testing mv cables examples
Circuit A  PILC cable 245 m

• showing pd effect of time

after 18 days
Circuit A  PILC cable 245 m

- showing pd effect of time

after 26 days
Circuit A  PILC cable 245 m

- showing pd effect of time

after 34 days
Circuit A PILC cable 245 m

- showing pd effect of time

after 42 days
Circuit B

PILC cable 143 m

• showing pd effect of current load
Circuit C

PILC cable 666 m

- growing intense pd’s
- one week radio silence
- failure at pd location
PILC cable 214 m

- intense pd's from resin joint at 139 m
- withstand test, that joint failed
- failure prevented
Circuit E

XLPE cable 4258 m

- growing pd's until failure in a shrink joint
Circuit F

XLPE cable 7058 m

- pd’s in cable !!!
- cable still in service !!!!
- damaged earth wire screen !!!!!
- failures prevented
Circuit G

XLPE cable 6576 m (with two RMU’s: at 4460 and 5720 m)

- pd’s from joint at 3343 m
- joint replaced
- failure prevented
Circuit H

XLPE cable 5661 m (with three RMU’s: at 4.6, 5 and 5.1 km)

- pd’s from joint at 4022 m
- joint replaced
- failure prevented

2 days

PD-OL
On-line PD testing mv cables knowledge rules

object number

noise level

PILC

acc-s

XLPE

defects clearly found
On-line PD testing mv cables conclusions

pd-ol main features:

- easy installation
- pd monitoring possible and at reduced costs
- all interpretation at one KEMA control centre
- users can see their hourly results via internet
Thank you very much for your attention