

RESIDUAL LIFE MONITORING OF XLPE-INSULATED CABLES

PS 2 D. A. Polyakov (Russia)



Omsk State TECHNICAL UNIVERSITY

PS2 D. A. Polyakov (Russia)

SESSION

CIGRE

2018

U S

SC B1 Discussion Group Meeting – 31/08/2018



CABLE INSULATION AGING PROBLEM Scigre Technological disturbances



Fig. 1. Cable technological disturbances in Siberia 2010-2016

PS2 D. A. Polyakov (Russia)

SC B1 Discussion Group Meeting – 31/08/2018



THEORETICAL RESEARCH

Kuchinsky insulation aging model $\tau_o = AE^{-n} \exp\left(\frac{W_a}{kT}\right)$

SESSION

CIGRE

2018

U S Insulation degradation function Insulation aging empiric function

$$N(t) = N_0 e^{-b \cdot t}$$

Assessed operation life



 $-C \cdot B \cdot E^{n} \cdot K_{0} \cdot \exp\left(-\frac{W_{a}}{kT}\right) \cdot \tau_{o} = \ln\frac{N_{cr}}{N_{0}}$

$$N(t) = N_0 e^{-C \cdot B \cdot E(t)^n \cdot K_0 \cdot \exp\left(-\frac{W_a}{kT(t)}\right) \cdot t}$$

.

11



CABLE INSULATION RESIDUAL LIFE MONITORING DEVICE



Fig. 3. Cable insulation residual life monitoring device

PS2 D. A. Polyakov (Russia)

SC B1 Discussion Group Meeting - 31/08/2018

CONCLUSIONS



The mathematical model of the cable XLPE-insulation residual life monitoring is proposed

The result of the simulation shows the ability of the operation life assessment algorithm to monitor the insulation operation life and residual life



The cable XLPE-insulation residual life monitoring technique device experimental sample is developed Fig. 4. Cable insulation residual life monitoring device experimental sample

PS2 D. A. Polyakov (Russia)



Thank you for your attention!

D. A. Polyakov (Russia) E-mail: polyakowdmitry@yandex.ru

PS2 D. A. Polyakov (Russia)

 \mathbb{Z}

SS

00

201

U S

SC B1 Discussion Group Meeting – 31/08/2018