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GB/Z 28820.3-2012

Long-term radiation ageing in polymers -- Part 3: Procedures for in-service monitoring of low-voltage cable materials

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Table of Contents

Foreword

GB /Z 28820 "polymer long-term radiation aging" consists of three parts.

--- Part 1. Monitoring of diffusion-limited oxidation technology;

--- Part 2. Prediction of aging programs at low dose rates;

--- Part 3. Low voltage cable materials in service monitoring procedures.

This section GB /Z 28820 Part 3.

This section drafted in accordance with GB/T 1.1-2009 given rules.

This section uses the translation method identical with IEC /T S61244-3.2005 "polymer long-term radiation aging Part 3. Low voltage cable materials

In-service monitoring program. "

This part is proposed by China Electrical Equipment Industry Association.

This part of the National Electrical insulating materials and insulation system assessment standardization Technical Committee (SAC/TC301).

This section is drafted unit. Shanghai Electric Cable Research Institute, Beijing Institute of Electrical Technology and Machinery Economy, Shenzhen Wal-Core Materials Co., Ltd.

Company, Shenzhen Xusheng Sanyi Technology Co., Ltd., Shanghai Nuclear Industry Research and Design Institute, Shanghai Special Cable Electrician Technology Co., Ltd., Jiangsu Power on

Cable Group Co., Ltd., Shanghai Cable Factory Co., Ltd., Linhai Yadong Special Cable Material Factory, Shanghai Kaibo Special Cable Material Factory Co., Ltd., none

Xi Jiangnan Cable Co., Ltd., Changzhou eight benefits Cable Co., Ltd., Shanghai to the right of polymer materials Co., Ltd., Shanghai innovation high temperature

Cable Factory, Zhejiang Wanma Cable Co., Ltd.

Introduction

In radiation environments, polymers are widely used as electrical insulation materials (eg, control cables, instrumentation cables, and power cables). above

Under operating conditions, their operational lifetime is the entire operating life of a nuclear power plant, perhaps more than 40 years, and may be over its lifetime or

The end of the period will run under accident conditions. Although there are many data to evaluate the performance of polymeric insulation under radiation conditions,

There is no definitive assessment of cable performance under long-term, low-dose exposure. Therefore, cables are needed during the operation of a nuclear power plant

In-service monitoring of degradation of insulation materials. The right cable monitoring technology is the basis for a nuclear power station monitoring program that guarantees nuclear power plants

Life Extension and License Updates. The main content of this section is on the monitoring of cable performance under radiation environment, the same applies to other polymers.

These techniques can also be used for single heat aging monitoring of polymers.

Long-term polymer radiation aging

Part 3. Low voltage cable materials in service monitoring procedures

1 Scope

This part of GB /Z 28820 summarizes the current main cable monitoring technology. These technologies are mainly aimed at the degradation of low voltage cables

Monitoring. The advantages and limitations of each approach and its development are mentioned in the relevant chapters.

2 Normative references

The following documents for the application of this document is essential. For dated references, only the dated version applies to this article

Pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 26168.4-2010 Determination of the effects of ionizing radiation on electrical insulating materials - Part 4. Assessment procedures for aging during operation

(IEC 60544-5.2003, IDT)

3 Abbreviations

The following abbreviations apply to this document.

BR butyl rubber

CM status monitoring

CSPE chlorosulfonated polyethylene

CP chloroprene

DLO diffusion limited oxidation

DSC Differential Scanning Calorimeter

EPR ethylene-propylene rubber

EVA ethylene vinyl acetate copolymer

IR infrared spectrum

OIT oxidation induction period

OITP oxidation induces temperature

NIR NIR spectroscopy

NMR nuclear magnetic resonance

PE polyethylene

PVC PVC

PEEK polyetheretherketone

SBR styrene-butadiene rubber

TGA thermogravimetric analysis

XLPE XLPE

XLPO cross-linked polyolefin