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Maintenance of low voltage switchgear and controlgear and their assemblies

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CONTENTS

FOREWORD 4
INTRODUCTION 6
1 Scope 7
2 Normative references 7
3 Terms and definitions 7
4 Recommended safety measures 9
4.1 Local regulations 9
4.2 Appropriate skill level for maintenance 9
4.3 Good practice and procedures for establishing a safe working environment 9
4.3.1 Working procedures 9
4.3.2 Emergency exits 10
4.3.3 Fire extinguishing equipment 10
4.3.4 First aid 10
4.3.5 Lighting 10
4.3.6 Access 10
4.3.7 Isolation before and during maintenance work 11
4.3.8 Working on live equipment 11
4.3.9 Insulating equipment 12
4.3.10 Earthing equipment 12
4.3.11 Stored electrical energy 12
4.3.12 Associated section of the installation 12
4.3.13 Portable electric tools and inspection lamps 12
4.3.14 Testing instrument 12
4.3.15 Avoidance of contamination 13
4.3.16 Temporary safety signs or labels 13
5 Maintenance contributes to circular economy 13
5.1 General 13
5.2 Maintenance to extend lifetime 13
5.2.1 General 13
5.2.2 Maintenance to reduce carbon footprint 13
5.2.3 Maintenance to maximise material efficiency 13
5.3 Reused, refurbished and remanufactured products 14
6 Electrical preventive maintenance 14
6.1 General 14
6.2 Values and benefits of electrical preventive maintenance 14
7 Maintenance category of assemblies 14
7.1 General 14
7.2 Preventive maintenance categories 15
7.2.1 Scheduled maintenance 15
7.2.2 Condition-based maintenance 15
7.2.3 Predictive maintenance 15
8 Implementation and management of maintenance 15
8.1 General 15
8.2 Skill levels 16
8.2.1 General 16
8.2.2 Skill level 1 16

8.2.3 Skill level 2 16
8.2.4 Skill level 3 17
8.3 Maintenance instructions 17
8.4 Periodic verification 18
8.5 Replacement parts 18
8.6 Re-energisation 18
8.7 Documentation and records 18
9 Maintenance categories and associated functionalities 18
9.1 General 18
9.2 Maintenance category over lifetime of an assembly 19
9.3 Functions necessary to achieve a specific maintenance category 19
9.4 Details to be available for each category of maintenance 19
9.5 Shift from one category to another 20
Annex A (informative) Maintenance plan according to maintenance level 21
Annex B (informative) List of notes concerning certain countries 23
Annex C (informative) Frequency of periodic verification 24
C.1 Environmental conditions and device operating condition 24
C.1.1 General 24
C.1.2 Favourable environmental conditions and device operating conditions 24
C.1.3 Normal environmental conditions and device operating conditions 25
C.1.4 Severe environmental conditions and device operating conditions 25
C.2 Criticality of user application 25
C.3 Recommended frequency for maintenance program 26
Bibliography 27

Table 1 – Maintenance operation level 17
Table 2 – Functions associated with each category of maintenance 19
Table 3 – Details to be available for each category of maintenance 20
Table A.1 – Maintenance plan 21
Table C.1 – Favourable environmental conditions 24
Table C.2 – Normal environmental conditions 25
Table C.3 – Severe environmental conditions 25
Table C.4 – Recommended frequency according to operating conditions and criticality of the user application 26

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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MAINTENANCE OF LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR AND THEIR ASSEMBLIES

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IEC TR 63482 has been prepared by IEC technical committee 121: Switchgear and controlgear and their assemblies for low voltage. It is a Technical Report.

The text of this Technical Report is based on the following documents:

Draft	Report on voting
121/160/DTR	121/165A/RVDTR

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this Technical Report is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

INTRODUCTION

In the low-voltage domain, the evolution of the IEC 61439 series of standards (low-voltage switchgear and controlgear assemblies) incorporating devices according to IEC 60947 series (low-voltage switchgear and controlgear) have contributed significantly to improve safety, the performance and reliability of assemblies and power availability of low-voltage energy.

The IEC 61439 series is essentially dedicated to design and verification of assemblies up to the delivery to the customer. Most applications use assemblies to run 20 years or more. Over such long periods, without suitable maintenance, the performance of an assembly can be affected and unacceptably deteriorate with serious consequences for the safety of people and the application.

To minimize the risk of malfunction due to ageing of the low-voltage assemblies some type of maintenance is implemented depending on local rules, customer maintenance policy or assembly manufacturer instruction relating to the assembly or the built-in components within the assembly. Traditionally, maintenance is scheduled and has been predefined using a fixed schedule. To avoid malfunctions, the schedules are usually conservative.

As new technologies emerge, providing new functionalities and possibilities, for example measurement of equipment temperatures, loads including harmonic content, currents interrupted, climatic conditions, alternative and more effective maintenance approaches are possible. A preventive maintenance approach using such technologies can be more cost effective and less disruptive than the traditional schedule-based maintenance arrangements.

This document sets out the basic maintenance considerations for low-voltage switchgear, controlgear and their assemblies, which is supplemented by the assembly manufacturer’s instructions. It recognises that the traditional basic approach of maintenance can be improved and enhanced. This document shows that it is possible to provide one suitable maintenance approach depending on the current customer’s application, but it is also possible to move to a more advanced maintenance approach, if an assembly is suitably upgraded.

NOTE It is beneficial to refer to individual product standards and/or manufacturer instruction for further information on devices incorporated in an assembly.

MAINTENANCE OF LOW-VOLTAGE SWITCHGEAR AND CONTROLGEAR AND THEIR ASSEMBLIES

1 Scope

This document provides guidance for the specification and selection of the appropriate approach and for the planning and the execution of the maintenance of low-voltage switchgear and controlgear and their assemblies having a rated voltage up to and including 1 000 V AC or 1 500 V DC, and designed for a nominal frequency of the incoming supply or supplies not exceeding 1 000 Hz.

This document provides guidance on the safety precautions for personnel designed to carry out maintenance services, with the aim to minimize the safety risks, optimize service continuity (power availability) and contribute to the environment of a low-voltage switchgear and controlgear assemblies. It recognises there are different approaches to maintenance, e.g. scheduled maintenance, condition-based maintenance and predictive maintenance. This document does not consider specifically corrective maintenance but many of the recommendations included would apply when carrying out corrective maintenance. It provides additional recommendations to comply with validation requirements in IEC 60364-6.

This document explains how the use of preventive maintenance improves the efficiency and lifetime of built-in components and consequently the assemblies themselves. All parties (specifiers, owners, designers, manufacturers, maintenance personnel) involved with low-voltage switchgear and controlgear assemblies can benefit from this document.

This document applies to both stationary and movable switchgear and controlgear assemblies with or without an enclosure. It is also applicable to switchgear and controlgear assemblies intended for use under special service conditions, possibly with additional recommendations, for example in ships and rail vehicles. It also applies to low-voltage assembly upgrades which can have additional considerations to ensure modifications are fully verified to the appropriate assembly standard.

This document does not apply to low-voltage switchgear and controlgear assemblies used in potentially explosive atmospheres.

Finally, this document is not a substitute for national regulations regarding the safety of electrical equipment and for the manufacturer’s maintenance instructions. These are required to complement the overall principles defined in this document.

2 Normative references

There are no normative references in this document.