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TECHNICAL REPORT

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Communication networks and systems for power utility automation – Part 90-3: Using IEC 61850 for condition monitoring diagnosis and analysis

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FOREWORD

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The main task of IEC technical committees is to prepare International Standards. However, a technical committee may propose the publication of a technical report when it has collected data of a different kind from that which is normally published as an International Standard, for example "state of the art".

IEC TR 61850-90-3, which is a technical report, has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

The text of this technical report is based on the following documents:

Enquiry draft	Report on voting
57/1522/DTR	57/1654/RVC

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 61850 series, published under the general title *Communication networks and systems for power utility automation*, can be found on the IEC website.

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

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

The CMD (Condition Monitoring Diagnosis) which diagnoses power grid health status has been one of the major issues to improve the reliability of the power system by preventing a potential failure in advance. Since too many different information modelling, information exchange, and configuration techniques for CMD in various forms from many vendors are currently used, they need to be standardized within the IEC.

IEC 61850 is intended to be used to communicate with the condition monitoring equipment. A seamless communication with the sensor network is also desirable.

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1 Scope

Since the outcome of this work will affect several parts of IEC 61850, in a first step, this technical report has been prepared to address the topic from an application specific viewpoint across all affected parts of IEC 61850. This approach is similar to what is done as an example with IEC 61850-90-1 for the communication between substations. Once this technical report has been approved, the affected parts of the standard will be amended with the results from the report.

The major part of the work will consist in defining new logical nodes that contain the information for condition monitoring. It is important that the existing standards are analyzed with regard to information that is already available today. The information available in these logical nodes can as well be useful for asset management systems.

Another important aspect is a homogenous modelling approach that is to be used as well by other domains with a similar scope. Therefore, this technical report will include a chapter that describes the basic modelling approach that was used.

This technical report will address communication aspects related to specific sensor networks that are widely used as well as information exchange towards asset management systems where the IEEE PC37.239 is applicable, but it is not specific for the Condition Based Monitoring.

Several IEC technical committees cooperate to achieve harmonized (unified) models for CMD applications. Other areas of IEC work affected by the information contained in this technical report are: Overhead lines; Power transformers; Switchgear and controlgear; Electrical cables; Instrument transformers; and Wind turbines.

The parameters which are identifying this new namespace are:

- Namespace Version: 2015
- Namespace Revision: A
- UML model file which reflects this namespace edition: wg10uml02v18a-wg18uml02v11b-wg17uml02v17c-jwg25uml02v04c.eap, UML model version WG10UML02v18
- Namespace release date: 2015-10-05
- Namespace name: “(Tr)IEC61850-90-3:A”

The namespace “(Tr)IEC61850-90-3:A" is considered as "transitional" since the models are expected to be included in next editions of IEC 61850-7-4xx International Standards (IS). Potential extensions/modifications may happen if/when the models are moved to the International Standard status. Only the new data objects and CDCs which are not said to be inherited from existing LNs will be tagged with this namespace name. The others should still refer to the namespace where they are primarily defined."

Clauses 13 through 15 and their subclauses including XML enumerations are automatically generated from the UML model.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC TS 61850-2, *Communication networks and systems in substations – Part 2: Glossary*

IEC 61850-5:2013, *Communication networks and systems for power utility automation – Part 5: Communication requirements for functions and devices models 3*

IEC 61850-7-2:2010, *Communication networks and systems for power utility automation – Part 7-2: Basic communication structure – Abstract communication service interface (ACSI)*

IEC 61850-7-4:2010, *Communication networks and systems for power utility automation – Part 7-4: Basic communication structure – Compatible logical node classes and data object classes*

IEC 62271-203:2011, *High-voltage switchgear and controlgear – Part 203: Gas-insulated metal-enclosed switchgear for rated voltages above 52 kV*