



TECHNICAL REPORT



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

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMUNICATION NETWORKS AND SYSTEMS FOR POWER UTILITY AUTOMATION –

Part 90-3: Using IEC 61850 for condition monitoring diagnosis and analysis

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- withdrawn,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.

The contents of the corrigendum of November 2020 have been included in this copy.

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.

COMMUNICATION NETWORKS AND SYSTEMS FOR POWER UTILITY AUTOMATION –

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1 Scope

1.1 General

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.

1.2 Namespace name and version

Table 37 shows all attributes of (Tr)IEC61850-90-3:2015B namespace.

Table 37 – Attributes of (Tr)IEC61850-90-3:2015B namespace

Attribute	Content
Namespace nameplate	
Namespace Identifier	(Tr)IEC61850-90-3
Version	2015
Revision	B
Release	1
Full Namespace Name	(Tr)IEC61850-90-3:2015B
Namespace Type	transitional
Namespace dependencies	
extends	IEC 61850-7-4:2007B version :2007 revision :B
Namespace transitional status	
Future handling of namespace content	The name space (Tr)IEC61850-90-3:2015B is considered as "transitional" since the models are expected to be included in further editions IEC 61850-7-4xx. Potential extensions/modifications may happen if/when the models are moved to the International Standard status

The table below provides an overview of all published versions of this namespace.

Edition	Publication date	Webstore	Namespace
Edition 1.0	2016-05	IEC TR 61850-90-3:2016	(Tr) IEC61850-90-3:2015
Corrigendum 1	2020-10	IEC TR 61850-90-3:2016 Cor1	(Tr) IEC61850-90-3:2015B

1.3 Data model Namespace Code Component distribution

The Code Components are in light and full version:

- The full version is named: *IEC_TR_61850-90-3.NSD.2015B.Full*. It contains definition of the whole data model defined in this standard with the documentation associated and access is restricted to purchaser of this part
- The light version is named: *IEC_TR_61850-90-3.NSD.2015B.Light*. It does not contain any documentations but contains the whole data model as per full version, and this light version is freely accessible on the IEC website for download at : <http://www.iec.ch/tc57/supportdocuments>, but the usage remains under the licensing conditions.

The Code Components for IEC 61850 data models are formatted in compliance with the NSD format defined by the standard IEC 61850-7-7. Each Code Component is a ZIP package containing:

- the electronic representation of the Code Component itself (possibly multiple files),
- the grammar files (XSD) enabling to check the consistency of the associated files against the defined version of NSD, but as well against the IEC 61850 flexibility rules in case of private extensions
- a file describing the content of the package (IECManifest.xml).

The IECManifest contains different sections giving information on:

- The copyright notice
- The identification of the code component
- The publication related to the code component
- The list of the electronic files which compose the code component
- An optional list of history files to track changes during the evolution process of the code component

The life cycle of a code component is not restricted to the life cycle of the related publication. The publication life cycle goes through two stages, Version (corresponding to an edition) and Revision (corresponding to an amendment). A third publication stage (Release) allows publication of Code Component in case of urgent fixes of InterOp Tissues, thus without need to publish an amendment.

Consequently new release(s) of the Code Component may be released, which supersede(s) the previous release, and will be distributed through the IEC TC57 web site at: <http://www.iec.ch/tc57/supportdocuments>.

The latest version/release of the document will be found by selecting the file named *IEC_TR_61850-90-3.NSD.{VersionStateInfo}.Light* with the filed VersionStateInfo of the highest value.

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*