TECHNICAL SPECIFICATION

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AMENDMENT 1

Communication networks and systems for power utility automation –
Part 7-7: Machine-processable format of IEC 61850-related data models for tools

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COMMUNICATION NETWORKS AND
SYSTEMS FOR POWER UTILITY AUTOMATION –

Part 7-7: Machine-processable format
of IEC 61850-related data models for tools

AMENDMENT 1

FOREWORD

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Amendment 1 to IEC TS 61850-7-7:2018 has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

The text of this Amendment is based on the following documents:

Draft	Report on voting
57/2471/DTS	57/2523/RVDTS

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 Amendment 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/.

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.

This IEC standard includes Code Components i.e. components that are intended to be directly processed by a computer. Such content is any text found between the markers <CODE BEGINS> and <CODE ENDS>, or otherwise is clearly labeled in this standard as a Code Component.

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- withdrawn,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

IMPORTANT – The "colour inside" logo on the cover page of this document 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

Add, at the end of the Introduction, the following new text:

The description of namespace concept and relation between each kind of namespace is defined by IEC 61850-7-1 and process for creation of a namespace (domain, product, …) is defined by IEC 61850-1-2.

1 Scope

1.1   General

Replace the existing last paragraph of Subclause 1.1 with the following new text:

The purpose of this document is limited to the publication of the XML format which should support the data model part of any IEC 61850-related standard. The publication of code components themselves will be part of the related IEC 61850 part, and IEC 61850-1-2 will indicate the requirements to produce NSD files for other purpose than core datamodel.

1.2 Namespace name and version

Replace the existing title and text of Subclause 1.2 by the following new title and text:

1.2   Published versions

This technical specification defines one namespace:

–   A NameSpace Definition (NSD)

Table 1 provides an overview of the references between the published versions of this standard and the related namespace name.

**Table 1 – Reference between published versions of the standard
and related namespace name**

Edition	Publication date	Webstore	Namespace
Edition 1.0	2018-03	IEC 61850-7-7:2018	IEC 61850-7-7:2017A
Edition 1.1	2023-01	IEC 61850-7-7:2022	IEC 61850-7-7:2017B5

Add, after Subclause 1.2, the following new Subclause 1.4:

1.4   Namespace name and version

Table 2 shows all the attributes of the XML schema namespace.

Table 2 – Attributes of xsd namespace

Attribute	Content
Namespace nameplate	
Namespace Identifier (xmlns)	http://www.iec.ch/61850/2016/NSD
XSD version header attribute	2017B5
Version	2017
Revision	B
Release	5
CodeComponentName	NSD

1.3   Code Component distribution

Replace the existing text of Subclause 1.3 by the following new text:

1.3.1   General

Each Code Component is a ZIP package containing at least the electronic representation of the Code Component itself and a file describing the content of the package (IECManifest.xml).

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 TC 57 web site at:

http://www.iec.ch/tc57/supportingdocuments

The latest version/release of the document will be found by selecting the file for the code component with the highest value for VersionStateInfo, e.g. IEC TS 61850-7-7.NSD.{VersionStateInfo}.full.zip.

1.3.2   XML schema namespace code component

The NSD code component namespace is an XML schema file. It will be available in a full version.

The full version is freely accessible on the IEC website for download at:

https://assets.iec.ch/public/tc57/IEC_61850-7-7.2017.NSD.2017B4.full.zip

but the usage remains under the licensing conditions.

In case of any differences between the downloadable code and the IEC pdf published content, the downloadable code(s) is(are) the valid one; it may be subject to updates. See history files.

2   Normative references

Add the following new reference:

IEC TS 61850-1-2, *Communication networks and systems for power utility automation – Part 1-2: Guidelines on extending IEC 61850*

Replace the existing references to IEC TS 61850-2 and IEC 61850-7-1 with the following new references:

IEC TS 61850-2, *Communication networks and systems for power utility automation – Part 2: Glossary*

IEC 61850-7-1:2011, *Communication networks and systems for power utility automation – Part 7-1: Basic communication structure – Principles and models*

6.3.2   Core namespace

Replace the existing text of the first paragraph of Subclause 6.3.2 with the following new text:

Core namespaces are related to original data model from IEC 61850. These cover: IEC 61850-7-2, IEC 61850-7-3 and IEC 61850-7-4.

7.1 General

Replace the existing text of the first paragraph of Subclause 7.1 with the following new text:

Like SCL format (defined in IEC 61850-6), the machine-processable format is based on the Extensible Markup Language (XML) standard to represent namespaces. The format itself is called Namespace Definition (NSD).

7.2.1.2 Root element

Replace the existing text of Subclause 7.2.1.2 with the following new text:

The NSD file has the root element NS to identify the namespace represented with the ID, version revision and release (both are optional):

```
<NS id="IEC 61850-7-4" version="2007" revision="B" publicationStage="IS" namespaceType="basic" umlDate="2016-04-29T12:00:00Z" umlVersion="WG10built4">
```

In addition to namespace identification, the root element also indicates:

– publicationStage which allows to know if the NSD is an IS, TR, TS or a draft used during standard development,

– namespaceType to indicates following kind a namespace: basic, domain, transitional, product or private,

– umlDate and umlVersion to indicates the IEC 61850 UML version used to generate current NSD,

– deprecated will allow to indicate when a namespace become deprecated, typically when a TR will be integrated in core namespace.

As described in IEC 61850-1-2, since edition 2 amendment 1 of IEC 61850-7, the datamodels are managed with UML, increasing quality of the produced documents, and NSD definition allow identification of the UML used to produce the file, if any. These attributes are optional.

7.2.1.3 Version information elements

Replace, after the first paragraph of Subclause 7.2.13, the existing text with the following new text:

The first element, Changes, identifies the previous version of the namespace, the tissues which have been resolved and a list of TR namespaces merged in the current version:

```
<Changes version="2007" revision="A" tissues="650, 671"/>
```

The second element, DependsOn, defines another namespace which is used as a base to produce current namespace (like IEC 61850-7-3 defines elements used by IEC 61850-7-4):

```
<DependsOn id="IEC 61850-7-3" version="2007" revision="B" dependencyType="dependsOn"/>
```

The dependency description also provides a type allowing to indicate if this is a pure dependency, an inclusion or an extention.

"Includes" type dependency is intended for domain namespaces which need to extend LNs from other domains or basic namespaces, in order to provide similar functions with additional domain specific features, i.e. additional DOs, or to reuse existing DOs in a domain specific context.

"Extends" type dependency is reserved for specific namespaces which are not domain related. Such namespaces cannot be used as base namespace for a whole logical device (i.e. in LLN0.ldNs) and need to be declared only in lnNs (if the whole LN comes from this extended namespace) or in dataNs (if the DO namespace is different from the LN namespace).

In addition, inclusion and extension namespaces may include or extend multiple namespaces.

The complete set of rules is specified in IEC 61850-7-1:2011, clause 13.

The dependency to another namespace does not indicates any specific release and last release of given namespace version/revision shall be always considered, as a superceeding of previous release.

7.2.2.2   Root element

Replace the existing text of the second paragraph of Subclause 7.2.2.2 with the following new text:

An SNSD file has all attributes allowing to identify a namespace as defined in 7.2.1.2 (namespace and UML identification).

7.2.2.3   Type implementation element

Replace the existing XML text with the following new text:

```
<ServiceTypeRealizations>

    <ServiceTypeRealization titleID="IEC 61850-8-1:2003.PhyComAddr" name="PhyComAddrL2"

            realize="PhyComAddr">

        <SubDataAttribute name="Addr" typeKind="BASIC" type="Octet64" presCond="M"/>

    </ServiceTypeRealization>

</ServiceTypeRealizations>
```

Add, at the end of the second paragraph of Subclause 7.2.2.3, the following new text:

The attribute realize indicates the IEC 61850-7-2 type realized by the SCSM.

7.2.3.3   Service usage element

Replace the existing text of the third paragraph of Subclause 7.2.3.3 with the following new text:

Then the data model namespaces which use it are listed by element AppliesTo, with namespace "id", "version" and "revision" as identifier. Release of a namespace is not required as latest release of a namespace shall be used as a superceeding of the previous release.

7.3.4   DataObject parameterization

Replace the existing text of the second and third paragraphs of Subclause 7.3.4 with the following new text:

This type definition uses two XML attributes in NSD in DataAttribute element:

- typeKind which indicates if type is BASIC, ENUMERATED, CONSTRUCTED or SCSM,
- type which indicates the name of the type, depending of the typeKind.

In some cases, NSD will offer the possibility to define them later, by mean of two specific XML attributes of CDC element:

- when typeKindParameterized="true" is defined, this indicates that the type is not known in NSD and has to be defined on usage (typical case of CTS CDC) , and so typeKind shall be "undefined" and type shall not be defined in DataAttribute