



**BSI Standards Publication**

## **Communication networks and systems for power utility automation**

---

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

## National foreword

This Published Document is the UK implementation of IEC TS 61850-7-7:2018+A1:2023, incorporating corrigendum May 2025. It supersedes PD IEC TS 61850-7-7:2018, which is withdrawn.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to IEC text carry the number of the IEC amendment. For example, text altered by IEC amendment 1 is indicated by A1 A1.

The UK participation in its preparation was entrusted to Technical Committee PEL/57, Power systems management and associated information exchange.

A list of organizations represented on this committee can be obtained on request to its committee manager.

### Contractual and legal considerations

This publication has been prepared in good faith, however no representation, warranty, assurance or undertaking (express or implied) is or will be made, and no responsibility or liability is or will be accepted by BSI in relation to the adequacy, accuracy, completeness or reasonableness of this publication. All and any such responsibility and liability is expressly disclaimed to the full extent permitted by the law.

This publication is provided as is, and is to be used at the recipient's own risk.

The recipient is advised to consider seeking professional guidance with respect to its use of this publication.

This publication is not intended to constitute a contract. Users are responsible for its correct application.

This publication is not to be regarded as a British Standard.

© The British Standards Institution 2025  
Published by BSI Standards Limited 2025

ISBN 978 0 539 21178 8

ICS 33.200

### Compliance with a Published Document cannot confer immunity from legal obligations.

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 30 April 2018.

### Amendments/corrigenda issued since publication

| Date        | Text affected                                                       |
|-------------|---------------------------------------------------------------------|
| 31 May 2025 | Implementation of IEC amendment 1:2025 and IEC corrigendum May 2025 |

## CONTENTS

|                                                                                                 |    |
|-------------------------------------------------------------------------------------------------|----|
| FOREWORD.....                                                                                   | 5  |
| INTRODUCTION.....                                                                               | 7  |
| 1 Scope.....                                                                                    | 8  |
| 1.1 General.....                                                                                | 8  |
| 1.2 Published versions.....                                                                     | 8  |
| 1.4 Namespace name and version .....                                                            | 8  |
| 1.3 Code Component distribution .....                                                           | 9  |
| 1.3.1 General .....                                                                             | 9  |
| 1.3.2 XML schema namespace code component .....                                                 | 9  |
| 2 Normative references .....                                                                    | 9  |
| 3 Terms and definitions .....                                                                   | 10 |
| 4 Abbreviated terms .....                                                                       | 11 |
| 5 Use cases .....                                                                               | 11 |
| 5.1 Generation of SCL data type templates for system specification .....                        | 11 |
| 5.1.1 Description of the use case .....                                                         | 11 |
| 5.1.2 Technical details.....                                                                    | 13 |
| 5.1.3 Information exchanged .....                                                               | 13 |
| 5.2 Generation of SCL data type templates for ICD files .....                                   | 13 |
| 5.2.1 Description of the use case .....                                                         | 13 |
| 5.2.2 Technical details.....                                                                    | 15 |
| 5.2.3 Information exchanged .....                                                               | 16 |
| 5.3 Validation of data model conformity .....                                                   | 16 |
| 5.3.1 Description of the use case .....                                                         | 16 |
| 5.3.2 Diagrams of use case .....                                                                | 17 |
| 5.3.3 Technical details.....                                                                    | 18 |
| 5.4 Definition of private data model extensions by following the rules of the<br>standard ..... | 19 |
| 5.4.1 Description of the use case .....                                                         | 19 |
| 5.4.2 Diagrams of use case .....                                                                | 20 |
| 5.4.3 Technical details.....                                                                    | 21 |
| 5.4.4 Information exchanged .....                                                               | 22 |
| 5.5 Supporting the IEC 61850 data model change management .....                                 | 22 |
| 5.5.1 Description of the use case .....                                                         | 22 |
| 5.5.2 Diagrams of use case .....                                                                | 24 |
| 5.5.3 Technical details.....                                                                    | 26 |
| 5.5.4 Information exchanged .....                                                               | 27 |
| 5.5.5 Common terms and definitions.....                                                         | 28 |
| 6 Namespace file breakdown.....                                                                 | 28 |
| 6.1 General.....                                                                                | 28 |
| 6.2 Namespace dependencies .....                                                                | 28 |
| 6.3 Namespace types .....                                                                       | 30 |
| 6.3.1 General .....                                                                             | 30 |
| 6.3.2 Core namespace .....                                                                      | 30 |
| 6.3.3 Domain namespace .....                                                                    | 30 |
| 6.3.4 Technical report namespace .....                                                          | 30 |
| 6.3.5 Private namespace .....                                                                   | 31 |

|                     |                                                                                                     |    |
|---------------------|-----------------------------------------------------------------------------------------------------|----|
| 7                   | Overview of the format .....                                                                        | 31 |
| 7.1                 | General.....                                                                                        | 31 |
| 7.2                 | File types .....                                                                                    | 31 |
| 7.2.1               | NSD .....                                                                                           | 31 |
| 7.2.2               | SNSD .....                                                                                          | 35 |
| 7.2.3               | AppNS.....                                                                                          | 37 |
| 7.2.4               | NSDoc.....                                                                                          | 37 |
| 7.3                 | NSD usage convention.....                                                                           | 38 |
| 7.3.1               | General .....                                                                                       | 38 |
| 7.3.2               | Element identification .....                                                                        | 38 |
| 7.3.3               | Inheritance and extension.....                                                                      | 38 |
| 7.3.4               | DataObject parameterization .....                                                                   | 40 |
| 7.3.5               | CDC variants .....                                                                                  | 41 |
| 7.4                 | Naming convention .....                                                                             | 42 |
| 7.4.1               | File extension .....                                                                                | 42 |
| 7.4.2               | File name .....                                                                                     | 42 |
| 7.5                 | Example.....                                                                                        | 42 |
| 7.5.1               | General .....                                                                                       | 42 |
| 7.5.2               | NSD file example .....                                                                              | 42 |
| 7.5.3               | SNSD file example.....                                                                              | 43 |
| 7.5.4               | AppNS file example .....                                                                            | 43 |
| 7.5.5               | NSDoc file example .....                                                                            | 43 |
| 8                   | File usage .....                                                                                    | 43 |
| 8.1                 | General.....                                                                                        | 43 |
| 8.2                 | System specification creation.....                                                                  | 43 |
| 8.3                 | Manufacturer IED creation .....                                                                     | 45 |
| 8.4                 | Creation of a non-standard name space.....                                                          | 45 |
| 8.5                 | IED data model validation .....                                                                     | 45 |
| 8.6                 | Data model update management.....                                                                   | 45 |
| Annex A (normative) | Schema NSD.xsd .....                                                                                | 46 |
| Annex B (normative) | Compatibility of the different revisions of the standard .....                                      | 47 |
| B.1                 | General.....                                                                                        | 47 |
| B.2                 | NSD version management .....                                                                        | 47 |
| B.2.1               | NSD Schema version.....                                                                             | 47 |
| B.2.2               | NSD version identification.....                                                                     | 47 |
| B.2.3               | NSD version dependency .....                                                                        | 48 |
| B.3                 | DataObject parameterization.....                                                                    | 48 |
| Figure 1            | – Generation of SCL data type templates for system specification diagrams .....                     | 12 |
| Figure 2            | – Generation of SCL data type templates for ICD files diagrams .....                                | 15 |
| Figure 3            | – Validation of data model conformity diagrams .....                                                | 18 |
| Figure 4            | – Definition of private data model extensions by following the rules of the standard diagrams ..... | 21 |
| Figure 5            | – Supporting the IEC 61850 data model change management.....                                        | 25 |
| Figure 6            | – Namespace dependencies .....                                                                      | 29 |
| Figure 7            | – Service Namespace usage .....                                                                     | 30 |
| Figure 8            | – Abstract LNClass hierarchy example .....                                                          | 35 |

|                                                                                                |    |
|------------------------------------------------------------------------------------------------|----|
| Figure 9 – Specification type creation example .....                                           | 44 |
| Table 1 – Reference between published versions of the standard and related namespace name..... | 8  |
| Table 2 – Attributes of xsd namespace .....                                                    | 9  |

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**IEC TS 61850-7-7**  
Edition 1 2018-03  
Amendment 1  
Edition 1 2023-01

### COMMUNICATION NETWORKS AND SYSTEMS FOR POWER UTILITY AUTOMATION

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

## CORRIGENDUM 1

### INTRODUCTION TO CORRIGENDUM

#### a) Background

As part of the maintenance process for the standard, technical issues (called TISSUES) are collected through the website [iec61850.tissue-db.com](http://iec61850.tissue-db.com). A new TISSUE has been entered for IEC TS 61850-7-7:2018+AMD1:2023 which has to be implemented and published. This corrigendum notifies the replacement of the code component file IEC\_TS\_61850-7-7.2017.NSD.2017B5.full.zip by the following new code component file IEC\_TS\_61850-7-7.2017.NSD.2017B6.full.zip.

#### b) List of interoperability TISSUES to be released

The following tables provides an overview of the various TISSUES applicable to IEC TS 61850-7-7:2018+AMD1:2023 that will be released with this corrigendum. The table indicates the number of the TISSUE, the title, and an indication if the code component is impacted. The indication for the code component is in the column "CC" as follows:

- L: the light version and the full version are impacted
- F: only the full version is impacted; this is typically a change only in the description of elements

| Nr                   | Title                                               | CC |
|----------------------|-----------------------------------------------------|----|
| <a href="#">1930</a> | New PAS publication process is not supported by NSD | L  |

#### c) Published versions of the standard and related namespace names

The table below provides a reference between all published editions, amendments or corrigenda of this document and the full name of the namespace.

| 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 |
| Edition 1.1/COR1 | 2024-10          | IEC 61850-7-7:2022 | IEC 61850-7-7:2017B6 |

**d) Identification of the code component**

The namespace associated with this document is an XML schema (XSD) defining the structure of NSD files describing IEC 61850 data models namespaces. The parameters which identify the namespace are provided in the table below:

**Attributes of the IEC TS 61850-7-7 XML namespace**

| Attribute                    | Content                                                                         |
|------------------------------|---------------------------------------------------------------------------------|
| Namespace nameplate          |                                                                                 |
| Namespace Identifier (xmlns) | <a href="http://www.iec.ch/61850/2016/NSD">http://www.iec.ch/61850/2016/NSD</a> |
| Version                      | 2017                                                                            |
| Revision                     | B                                                                               |
| Release                      | 6                                                                               |
| XSD version header attribute | 2017B6                                                                          |
| Recommended reference name   | eIEC61850-7-7                                                                   |
| Code Component Name          | IEC_61850-7-7.2017.NSD.2017B6.full                                              |

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

### COMMUNICATION NETWORKS AND SYSTEMS FOR POWER UTILITY AUTOMATION –

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

#### FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

The main task of IEC technical committees is to prepare International Standards. In exceptional circumstances, a technical committee may propose the publication of a technical specification when

- the required support cannot be obtained for the publication of an International Standard, despite repeated efforts, or
- the subject is still under technical development or where, for any other reason, there is the future but no immediate possibility of an agreement on an International Standard.

Technical specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

Technical Specification IEC TS 61850-7-7 has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

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

|               |                  |
|---------------|------------------|
| Enquiry draft | Report on voting |
| 57/1925/DTS   | 57/1956/RVDTS    |

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

This document 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.

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.

The purchase of this IEC standard carries a copyright license for the purchaser to sell software containing Code Components from this standard directly to end users and to end users via distributors, subject to IEC software licensing conditions, which can be found at: <http://www.iec.ch/CCv1>.

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

- transformed into an International standard,
- 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

Year after year the IEC 61850 data models are extended both in depth with hundreds of new data items, and in width with tens of new parts.

In order to foster an active tool market with good quality, and at the end to improve IEC 61850 interoperability, a machine-processable file, describing data model related parts of the standard as input, is needed. This is the purpose of the new language Name Space Definition (NSD) defined by this part of IEC 61850.

This will avoid the need for any engineering tool related to the IEC 61850 data models to get the content of the standard manually entered, with a high risk of mistakes. This will also help to easily spread any corrections to the data model, as requested to reach interoperability. Tool vendors will be able to integrate NSD in their tools to distribute the standard data models directly to end users.

**A1** 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. **A1**

# COMMUNICATION NETWORKS AND SYSTEMS FOR POWER UTILITY AUTOMATION –

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

### 1 Scope

#### 1.1 General

This part of IEC 61850, which is a Technical Specification, specifies a way to model the code components of IEC 61850 data model (e.g., the tables describing logical nodes, common data classes, structured data attributes, and enumerations) in an XML format that can be imported and interpreted by tools. The following main use cases are supported:

- Generation of SCL data type templates for system specification or ICD files.
- Validation of SCL data type templates.
- Definition of private extensions by following the rules of the standard.
- Adapting rapidly the whole engineering chain as soon as a new version of IEC 61850 data model (an addendum, a corrigenda or a Tissue) affects the content of the standard.
- Provide tool-neutral textual help to users of tools on the data model contents.
- Supporting multi-language publication, i.e., enabling the expression of the data model in different languages, through a machine processable format.

**A1** 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. **A1**

#### 1.2 **A1** 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 |

#### 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                          |
|------------------------------|----------------------------------|
| <b>Namespace nameplate</b>   |                                  |
| Namespace Identifier (xmlns) | http://www.iec.ch/61850/2016/NSD |
| XSD version header attribute | 2017B5                           |
| Version                      | 2017                             |
| Revision                     | B                                |
| Release                      | 5                                |
| CodeComponentName            | NSD                              |

A1

### 1.3 Code Component distribution

#### A1 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](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. A1

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

**A1** IEC TS 61850-1-2, *Communication networks and systems for power utility automation – Part 1-2: Guidelines on extending IEC 61850*

IEC TS 61850-2, *Communication networks and systems for power utility automation – Part 2: Glossary* **A1**

IEC 61850-6, *Communication networks and systems for power utility automation – Part 6: Configuration description language for communication in electrical substations related to IEDs*

**A1** IEC 61850-7-1:2011, *Communication networks and systems for power utility automation – Part 7-1: Basic communication structure – Principles and models* **A1**

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

IEC 61850-7-3, *Communication networks and systems for power utility automation – Part 7-3: Basic communication structure – Common data classes*

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

IEC 61850-8-1, *Communication networks and systems for power utility automation – Part 8-1: Specific communication service mapping (SCSM) – Mappings to MMS (ISO 9506-1 and ISO 9506-2) and to ISO/IEC 8802-3*

ISO 639-1:2002, *Codes for the representation of names of languages – Part 1: Alpha-2 code*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC TS 61850-2 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

#### 3.1 data model

hierarchical structure of data and the related services used to define functions and devices in IEC 61850

Note 1 to entry: The IEC 61850 standard series defines the core data model in IEC 61850-7-2, IEC 61850-7-3 and IEC 61850-7-4, which is also the data model related to Substations. Other domains (like DER, Hydro, Wind, etc.) could define their own data model based on IEC 61850 core data model to be able to use IEC 61850 core parts as a common layer.

#### 3.2 namespace

identification of a data model of a specific part of the standard

Note 1 to entry: This definition will be used in this document when a specific data model has to be represented.

Note 2 to entry: The W3C consortium has also defined the concept of namespace for XML documents to identify the kind of elements which could be used in a file. This is typically the namespace used to identify an XML schema, as per IEC 61850-6 usage. This is not the definition used within this document.

## 4 Abbreviated terms

In general, the glossary and abbreviated terms defined in IEC 61850-2 apply. The following abbreviated terms are either exclusive to this document or particularly useful for understanding this document and are repeated here for convenience.

|     |                                           |
|-----|-------------------------------------------|
| CDC | Common Data Class                         |
| DO  | Data Object                               |
| DA  | Data Attribute                            |
| LN  | Logical Node                              |
| NSD | Name Space Definition                     |
| SCL | System Configuration description Language |
| UML | Unified Modeling Language                 |
| XML | Extensible Markup Language                |
| XSD | XML Schema Definition                     |

## 5 Use cases

### 5.1 Generation of SCL data type templates for system specification

#### 5.1.1 Description of the use case

##### 5.1.1.1 Name of use case

| <i>Use case identification</i> |                  |                                                                                          |
|--------------------------------|------------------|------------------------------------------------------------------------------------------|
| <i>ID</i>                      | <i>Domain(s)</i> | <i>Name of use case</i>                                                                  |
|                                | Administration   | Use machine readable format to generate SCL data type templates for system specification |

##### 5.1.1.2 Narrative of use case

| <i>Narrative of use case</i>                                                                                                                                                                                                                                                                                    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b><i>Short description – max 3 sentences</i></b>                                                                                                                                                                                                                                                               |
| User take the namespace NSD corresponding to its needs and create data type templates based on it.                                                                                                                                                                                                              |
| <b><i>Complete description</i></b>                                                                                                                                                                                                                                                                              |
| This use case describes how a Machine Processable file user can take benefit of the NSD publication to create datatype templates from the standard description and allow creation of an SSD for the specification of the process.<br>The Figure 1 presents the use case and the corresponding sequence diagram. |

##### 5.1.1.3 General remarks

| <i>General remarks</i>                                                                                                                                                                                                              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The creation of a data model for a process specification shall follow rules from standard definitions of IEC 61850-7-2, IEC 61850-7-3, IEC 61850-7-4 or derived data models for other domains (like Wind farm with IEC 61400-25-2). |
| This creation is done manually by checking against the standard in paper format. This is source of errors.                                                                                                                          |
| Usage of NSD will allow for a tool to have the list of LNClass and CDCs available in a standard to allow user to use them as input to its definition.                                                                               |

#### 5.1.1.4 Diagrams of use case

##### Diagram of use case

##### The primary use case

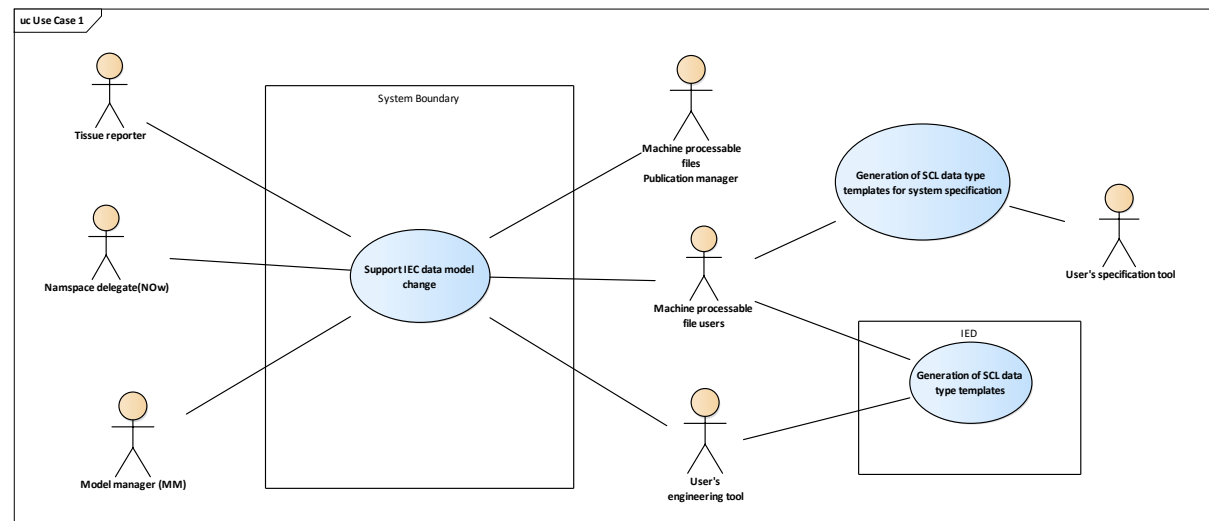
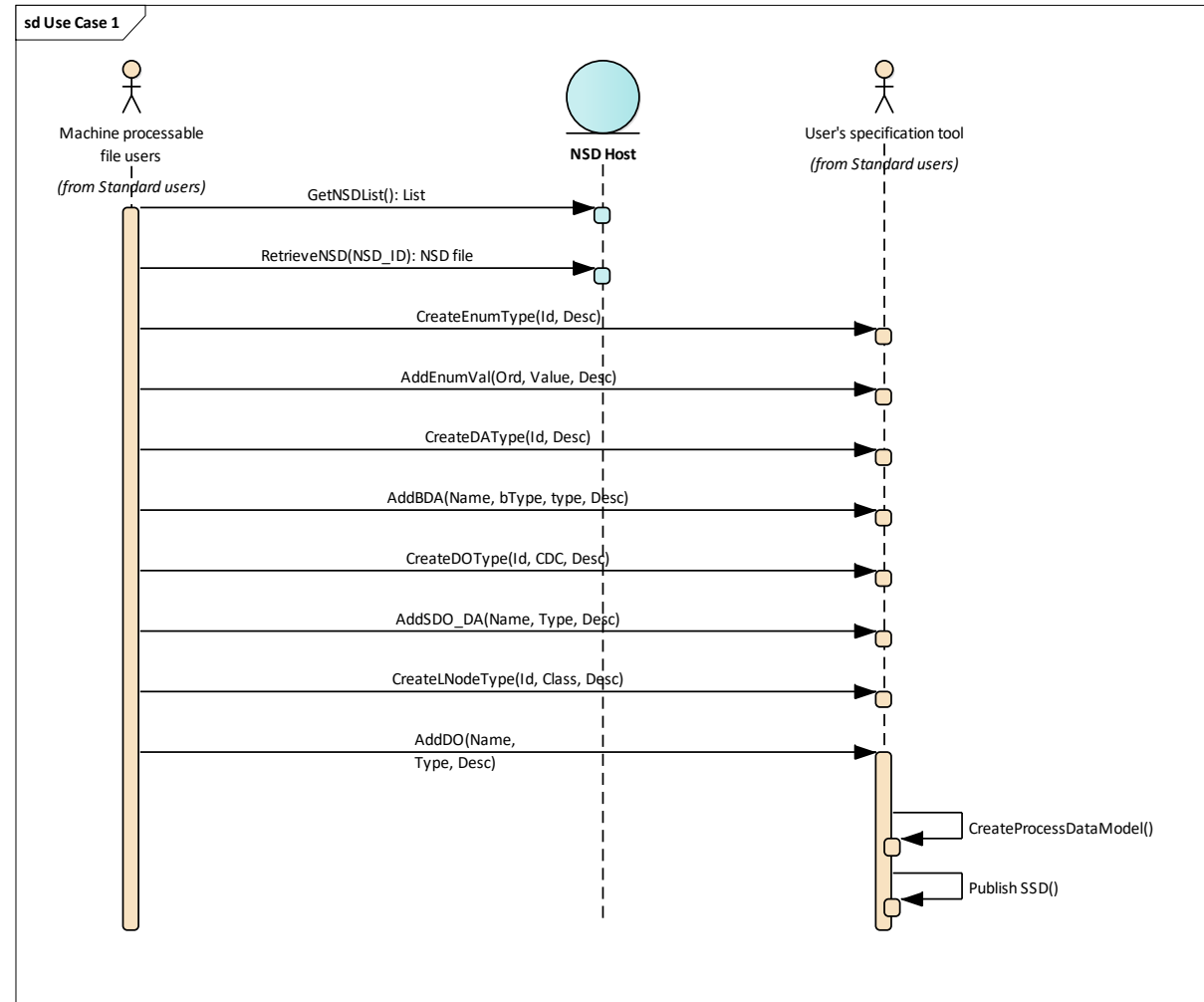


Figure 1 – Generation of SCL data type templates for system specification diagrams

## 5.1.2 Technical details

### 5.1.2.1 Actors: People, systems, applications, databases, the power system, and other stakeholders

| <b>Actors</b>                              |                                            |                                                               |                                                                |
|--------------------------------------------|--------------------------------------------|---------------------------------------------------------------|----------------------------------------------------------------|
| <b>Grouping (community)</b>                |                                            | <b>Group description</b>                                      |                                                                |
|                                            |                                            |                                                               |                                                                |
| <b>Actor name</b><br><i>see actor list</i> | <b>Actor type</b><br><i>see actor list</i> | <b>Actor description</b><br><i>see actor list</i>             | <b>Further information</b><br><i>specific to this use case</i> |
| <b>Machine readable file users</b>         | people                                     | user of machine readable file, involved in system engineering |                                                                |
| <b>User's engineering system</b>           | system                                     | engineering system of the Machine readable file users         | IED specification tool                                         |

### 5.1.2.2 Preconditions, assumptions, post condition, events

| <b>Use case conditions</b>               |                         |                       |                                                                        |
|------------------------------------------|-------------------------|-----------------------|------------------------------------------------------------------------|
| <b>Actor/System/Information/Contract</b> | <b>Triggering event</b> | <b>Pre-conditions</b> | <b>Assumption</b>                                                      |
| NSD Host                                 |                         |                       | The latest NSD of the IEC 61850 namespaces are hosted on the NSD host. |
|                                          |                         |                       |                                                                        |

## 5.1.3 Information exchanged

| <b>Information exchanged</b>         |                                                                                                               |                                              |
|--------------------------------------|---------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| <b>Name of information exchanged</b> | <b>Description of information exchanged</b>                                                                   | <b>Requirements to information data R-ID</b> |
| NSD_ID                               | Identifier of an NSD, based on the namespace identifier based on the publication number, version and revision |                                              |
| NSD list                             | List of available NSD on the NSD Host with a description                                                      |                                              |
| NSD file                             | The file representing a Namespace data model to be used by a tool                                             |                                              |

## 5.2 Generation of SCL data type templates for ICD files

### 5.2.1 Description of the use case

#### 5.2.1.1 Name of use case

| <b>Use case identification</b> |                  |                                                                               |
|--------------------------------|------------------|-------------------------------------------------------------------------------|
| <b>ID</b>                      | <b>Domain(s)</b> | <b>Name of use case</b>                                                       |
|                                | Administration   | Use machine readable format to generate SCL data type templates for ICD files |

#### 5.2.1.2 Narrative of use case

| <b>Narrative of use case</b>                                                          |
|---------------------------------------------------------------------------------------|
| <b>Short description – max 3 sentences</b>                                            |
| User take the namespace NSD corresponding to its needs and create data type templates |