# IEC TR 62357-2

Edition 1.0 2019-04

# TECHNICAL REPORT

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## Power systems management and associated information exchange – Part 2: Use cases and role models



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# POWER SYSTEMS MANAGEMENT AND ASSOCIATED INFORMATION EXCHANGE –

## Part 2: Use cases and role models

## 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 62357-2, 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:

| DTR | Report on voting |
|---|---|
| 57/2042/DTR | 57/2066/RVDTR |

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

A list of all parts in the IEC 62357 series, published under the general title *Power systems management and associated information exchange*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://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- withdrawn,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.

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 IEC is in an operational implementation phase of the System approach of standardization. Technical Committee 57 (TC 57) has a crucial role in helping other Application Domain TCs extending their core standards (i.e. CIM standards/IEC 61850/IEC 62746/IEC 62351) to their specific domains. This should ensure efficient and secured power network management.

In the system approach working process, it is important for TC 57 to be able to consolidate, share and explain the numerous Use Cases serving as basis for its standardization work. These Use Cases are an excellent tool for design and implementation of new processes, also for external organisations (SDOs, User Groups, Alliances etc.)

The mission of this Technical Report is to list the Use Cases featured in the TC 57 standardization work, thus making them available for re-use in on-going and future work. Hopefully this will also promote Use Cases as a good tool for further work.

The intended audience for the document is the experts of TC 57 for their standardization work or experts of other Application Domain TCs for on-going standardization work, independently from TC 57 or through Joint Working Groups (JWG) or Task Forces (TF), as well as roadmaps and strategic vision through Ad-hoc Groups, Strategic Groups, System Evaluation Groups or System Committees.

This document structures and consolidates the TC 57 Use Cases (Status, WG and documents linked, roles used, roadmap) to facilitate their use and re-use. It will list the following elements:



- Existing Use Cases used to develop standards and their links with source documents, the IEC Status of this source document, a short Use Case description, its compliance to IEC 62559-2
- A roadmap: planned or drafted Use Cases (in on-going standardization work and PWI)
- Roles used in those Use Cases
- Terminology used in standardization work and not present in existing standards



This Technical report is split by active Working Group (WG) of TC 57

- WG 10 Power system IED communication and associated data models
- WG 13 Energy Management Systems Application Program Interfaces (EMS API)"
- WG 14 System interfaces for distribution management
- WG 15 Data and Communication Security
- WG 16 Deregulated Market Communications
- WG 17 Power system intelligent electronic device communication and associated data models for distributed energy resources and distribution automation
- WG 18 Hydroelectric power plants – Communication for monitoring and control
- WG 19 Interoperability within TC 57 in the long term
- WG21 Interfaces and protocol profiles relevant to systems connected to the electrical grid

# POWER SYSTEMS MANAGEMENT AND ASSOCIATED INFORMATION EXCHANGE –

# Part 2: Use cases and role models

## 1 Scope

This part of IEC 62357, which is a technical report, establishes the list of Use Cases developed by TC 57, Power systems management and associated information exchanges, in order to prepare International Standards, Technical Reports and Technical Specifications.

Use Cases are fundamental to TC 57 publications, as shown in Figure 1.

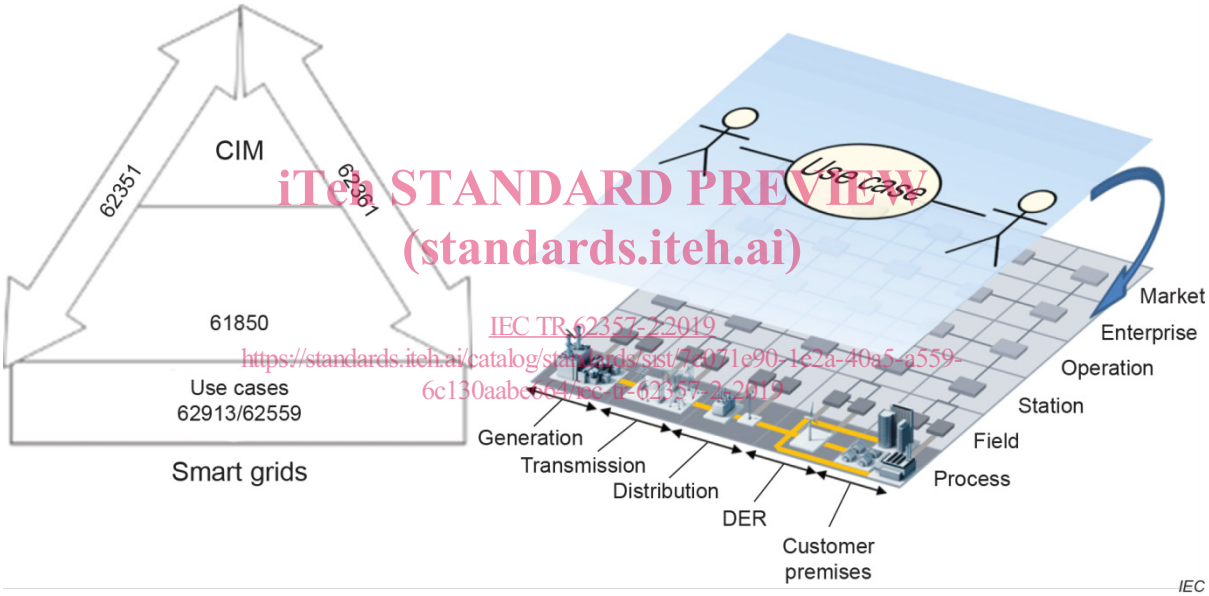




**Figure 1 – TC 57 core standards**

The Use Case creation process is shown in Figures 2, 3 and 4.

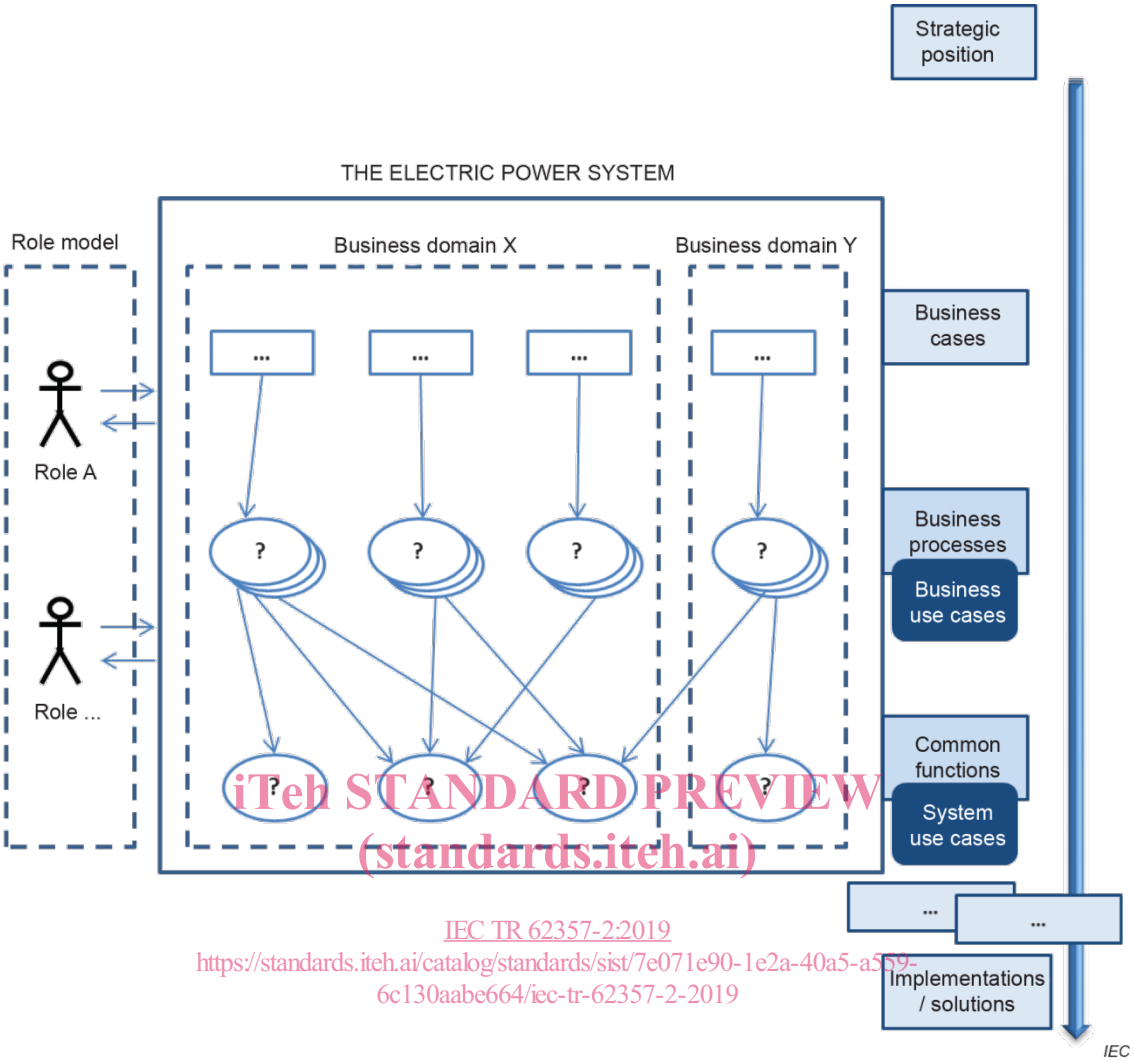




**Figure 2 – UML-driven top/down approach supporting IEC 62559 and IEC 62913**

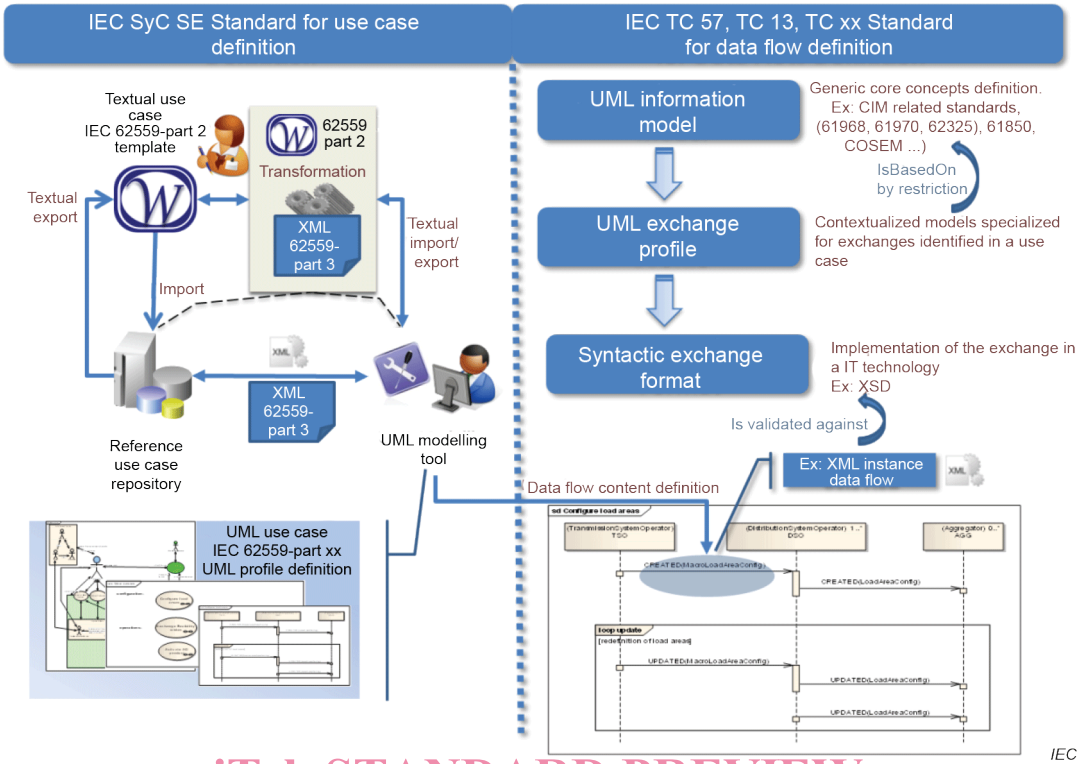




**Figure 3 – Use Case design process**



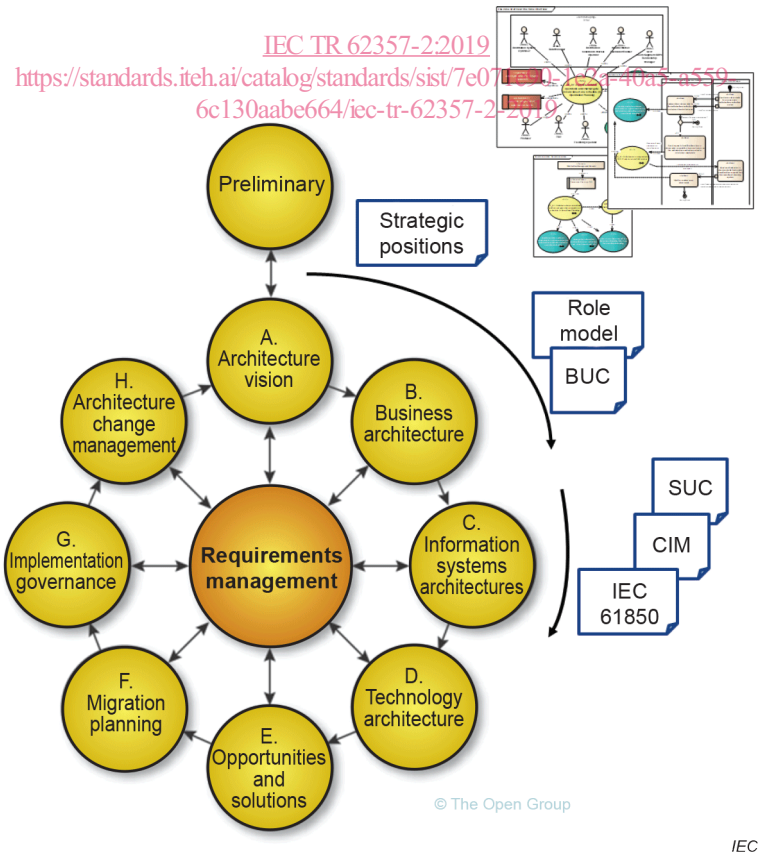


**Figure 4 – Enterprise architecture and IEC core standards relationships**

This Technical Report:

- Identifies in existing standards, technical specification, reports and in ongoing TC 57 work (CD, DTS, DTR etc.) the Use Cases used as well as their links to standards, their status as Use Cases (level of description, standardization of the description referring to IEC 62559) and as IEC deliverables (are they in a TR/TS/IS, what is the status of the document CD, CDV etc.)
- Helps System Committees consolidate Use Cases through terminology and term definition work (link with existing relevant standards on the TC Terminology) and building links between roles and modelling frameworks (Role models). For example in TC 57 building links between the Use Case methodology and the roles used in IEC 62913-2 with CIM Interface Reference Model (IRM – IEC 61968).
- Shares and promotes those Use Cases within TC 57 and outside it. TC 57 mainly describes System Use Cases in the standards it publishes. Business roles and business Use Cases are mainly described within SyC SE (System Committee Smart Energy) deliverables (IEC 62559 series and IEC 62913 series).
- This document provides good input in reusing System Use Cases and System Roles inside and outside TC 57.
- Explains the content of its Use Cases to potential users and providing support on using those Use Cases for standardization (Normative context, maturity of the Use Case, location in standardization work, roles implied)

Those Use Cases aimed to be used as tools to identify requirements as input to further development of technical standards (whether TC 57 or not) and improve the consistency in this work and in that way contribute to interoperability. Use Cases facilitate cooperation at a system level with TCs, other standards-developing organizations, non-traditional players of electrotechnology, and regional organizations. Inside the IEC they provide a convergence platform with overall system level value for support of the Technical Committees and other standard development groups.



This document allows TC 57 to self-assess its work on Use Cases through KPIs (Key Performance Indicator) such as:

- % of Use Cases compliant with IEC 62559-2
- % of Business Use Cases (BUC) and System Use Cases (SUC)
- % of Business Roles and System Roles
- % of non-defined roles

Another objective of this document is to fill up the TC 57 Use Case Repository, as shown in Figure 5.

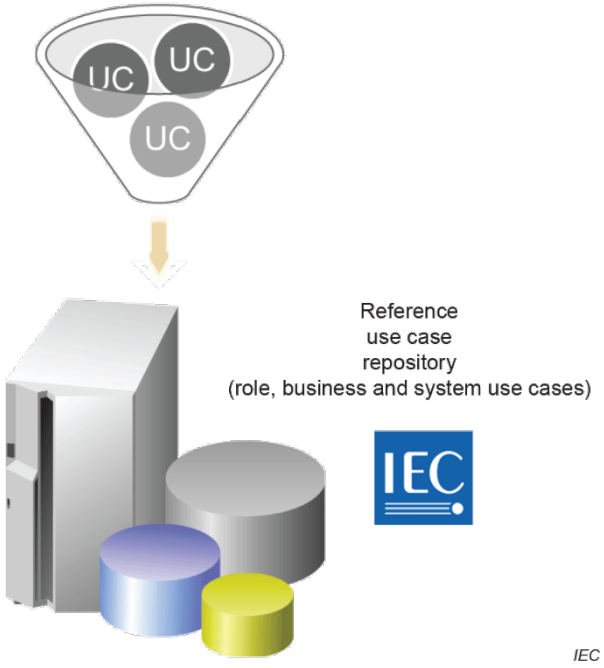


**Figure 5 – Use Case Repository**



## 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.



IEC 60870-5, *Telecontrol equipment and systems – Part 5: Transmission protocols*

IEC 60870-6, *Telecontrol equipment and systems – Part 6: Telecontrol protocols compatible with ISO standards and ITU-T recommendations*

IEC 61850 (all parts*), Communication networks and systems for power utility automation*

IEC 61968 (all parts), *Application integration at electric utilities – System interfaces for distribution management*

IEC 61970 (all parts*), Energy management system application program interface (EMS-API)*

IEC 62351 (all parts), *Power systems management and associated information exchange – Data and communications security*

IEC 62325 (all parts), *Framework for energy market communications*

IEC 62361 (all parts), *Power systems management and associated information exchange – Interoperability in the long term*

IEC 62559-2:2015, *Use case methodology - Part 2: Definition of the templates for use cases, actor list and requirements list*

IEC 62746 (all parts), *Systems interface between customer energy management system and the power management system*

IEC TS 62913-1, *Generic Smart Grid Requirements – Specific application of the Use Case methodology for defining Generic Smart Grid Requirements according to the IEC System approach*[1]

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions 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**
**actor**
entity that communicates and interacts

Note 1 to entry: These actors can include people, software applications, systems, databases, and even the power system itself.

Note 2 to entry: In IEC TS 62913-1 this term includes the concepts of Business Role and System Role involved in Use Cases.

[SOURCE: IEC 62559-2:2015]



**3.2**
**business role**
role describing a finite set of responsibilities that is assumed by a party (organizations, organizational entities or physical persons)



**3.3**
**levels of maturity**
set of structured levels that describe how well a process, or Use Case, is implemented through an organization and relates to its degree of formality, optimization and reliability

Note 1 to entry: Proposed levels of maturity:

– Level "Already implemented": the process is implemented in and between several organizations, it is well defined, reliable, sustainable and few uncertainties remain in its framework (regulatory, business or technological).

– Level "Adjustments in progress": the process is implemented in few organizations, it is well defined but subject to remaining major uncertainties in its framework (regulatory, business or technological).

– Level "Explorative": the process is tested in very few organizations, it is not completely defined and subject to numerous major uncertainties in its framework (regulatory, business or technological).

**3.4**
**role**
type of actor which has responsibilities and represents the external intended behavior of a party

EXAMPLE 1 A legally defined market participant (e.g. grid operator, customer), a generic role which represents a bundle of possible roles (e.g. flexibility operator) or an artificially defined body needed for generic process and Use Case descriptions.

Note 1 to entry: IEC TS 62913 uses two kinds of roles: Business Roles and System Roles.

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[1] Under preparation. Stage at the time of publication: IEC/RPUB 62913-1:2019.

Note 2 to entry: Legally or generically defined external actors may be named and identified by their roles.

Note 3 to entry: Between Systems, Devices and Operators can be described or modelled as System Use Cases.

[SOURCE: SG-CG/M490/C:2012-12]

**3.5**
**system role**
role describing a finite set of functionalities that is assumed by an entity (devices, information system, equipment)

**3.6**
**Use Case**
specification of a set of actions performed by a system, which yields an observable result that is, typically, of value for one or more actors or other stakeholders of the system

Note 1 to entry: There are two types of Use Cases:

– Business Use Cases describe how Business Roles interact to execute a business process. These processes are derived from services, i.e. business transactions, which have previously been identified.

– System Use Cases describe how System and/or Business Roles of a given system interact to perform a Smart Grid Function required to enable / facilitate the business processes described in Business Use Cases. Their purpose is to detail the execution of those processes from an Information System perspective.

Note 2 to entry: Since a Smart Grid Function can be used to enable / facilitate more than one business process, a System Use Case can be linked to more than one Business Use Case.



Table 1 highlights the differences between these 2 types of Use Case.

**Table 1 – Differences between Business and System Use Cases**



| Type of Use Case | Description | Actors involved |
|---|---|---|
| Business Use Cases (BUC) | Depicts a business process– Expected to be system agnostic | Business Roles (organizations, organizational entities or physical persons) |
| System Use Cases (SUC) | Depicts a function or sub-function supporting one or several business processes | Business Roles and System Roles ( Devices, Information System) |