

ICS 35.240.20

# 中華民國國家標準

## C N S

### 使用案例方法論 - 第 2 部：用於使用 案例、行為者清單及要求事項清單之 模板的定義

Use case methodology – Part 2: Definition  
of the templates for use cases, actor  
list and requirements list

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## 前言

本標準係依據 2015 年版 ISO/IEC 62559-2，不變更技術內容，制定成為中華民國國家標準者。

本標準係依標準法之規定，經國家標準審查委員會審定，由主管機關公布之中華民國國家標準。

依標準法第 4 條之規定，國家標準採自願性方式實施。但經各該目的事業主管機關參引全部或部分內容為法規者，從其規定。

本標準並未建議所有安全事項，使用本標準前應適當建立相關維護安全及健康作業，並且遵守相關法規之規定。

本標準之部分內容，可能涉及專利權、商標權及著作權，主管機關及標準專責機關不負責任何或所有此類專利權、商標權及著作權之鑑別。

## 簡介

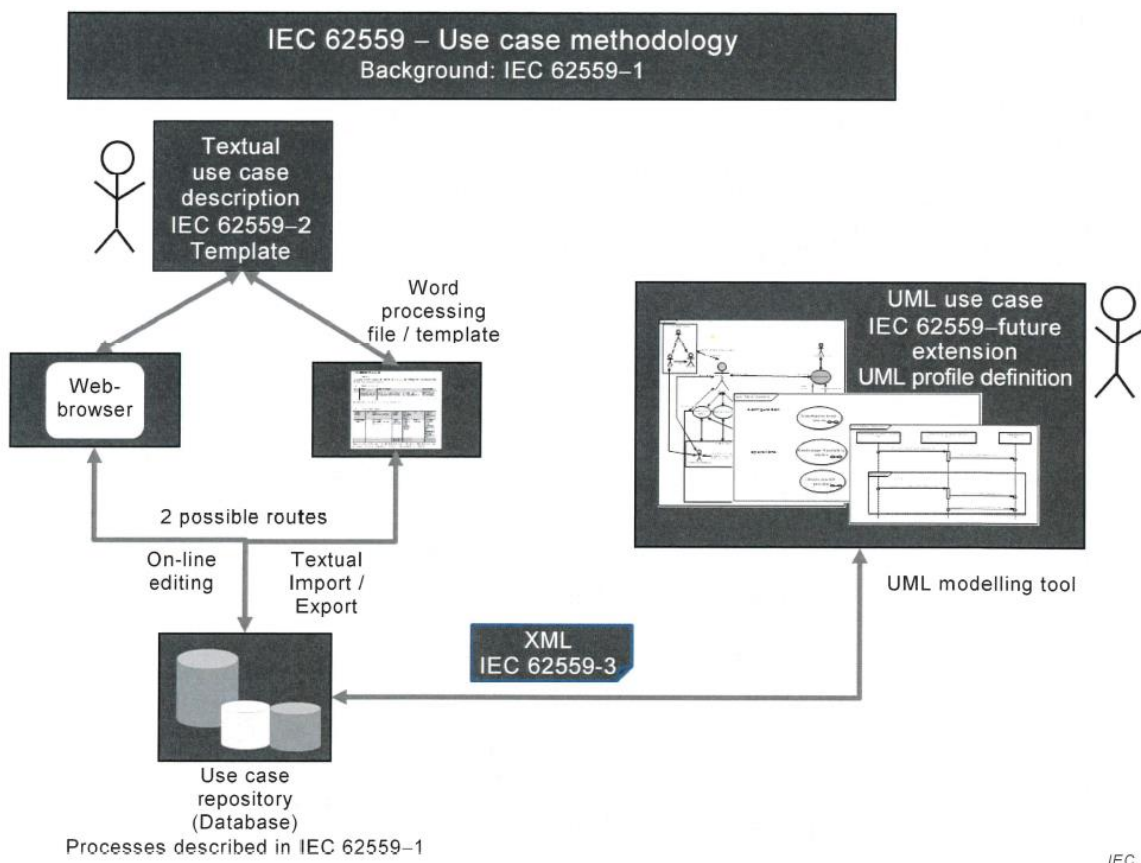
### Introduction

針對複雜系統，使用案例方法論支援不同技術委員會甚至不同組織對功能、行為者及過程之共同理解。該方法論作為軟體工程工具開發，可用以支援標準之發展，因其有助於分析與新標準或既存標準相關的要求事項。本系列標準第 1 部中提供有關使用案例方法論及背景資訊之更多論點。

圖 1 提供本系列標準預期之第 1 部，主要描述本標準與本系列標準第 3 部間的關係。

For complex systems, the use case methodology supports a common understanding of functionalities, actors and processes across different technical committees or even different organizations. Developed as software engineering tool, the methodology can be used to support the development of standards as it facilitates the analysis of requirements in relation to new or existing standards. Further arguments for the use case methodology and background information are available in IEC 62559-1.

Figure 1 provides an of the intended first parts of the IEC 62559, mainly describing the relation between - IEC 62559-2 and IEC 62559-3.



IEC 62559 – Use case methodology 本系列標準 - 使用案例方法論

Background: IEC 62559-1 背景：本系列標準第 1 部

Textual use case description IEC 62559-2 Template 文字式使用案例說明本標準模板

Web-browser 網頁瀏覽器

Word processing file/template 文書處理檔案/模板

2 possible routes 2 個可能路徑

On-line editing 線上編輯

Textual import/export 文字匯入/匯出

Use case repository (database) 使用案例庫(資料庫)

Processes described in IEC 62559-1 本系列標準第 1 部中所描述之過程

IEC 62559-3 本系列標準第 3 部

UML use case UML 使用案例

IEC 62559-future extension UML profile definition 本系列標準未來延伸 UML 剖面定義

UML modelling tool UML 建模工具

圖 1 IEC 62559 標準系列 Figure 1 - IEC 62559 standard series

本系列標準第 1 部 - 標準化中之概念及過程。

本系列標準第 1 部為共同使用案例儲存庫(repository)之基礎,以便於共同協作平台上收集 IEC 內的使用案例。此儲存庫亦將用以組織使用案例之調和,以便提供廣泛接受的共同使用案例作為進一步標準化工作之基礎。其描述過程並提供使用案例方法論之基礎知識,如用語或使用案例型式。

IEC 62559-1 - Concept and processes in standardization.

IEC 62559-1 is the basis for a common use case repository in order to gather use cases within IEC on a common collaborative platform. This repository will also be used to organize a harmonization of use cases in order to provide broadly accepted generic use cases as basis for the further standardization work. It describes processes and provides basics for the use case methodology like terms or use case types.

本標準 - 定義用於使用案例、行為者清單及要求事項(requirements)清單之模板。

本標準定義使用案例模板、行為者清單及要求事項清單之結構。本標準係主要基於先前 IEC PAS 62559 規格,應與本系列標準第 1 部一起閱讀。

IEC 62559-2 - Definition of the templates for use cases, actor list and requirements list.

IEC 62559-2 defines the structure of a use case template, an actor list and a list for requirements. The document is mainly based on the previous IEC PAS 62559 specification and shall be read together with IEC 62559-1.

本系列標準第 3 部 - 將使用案例模板工件定義為 XML 序列化格式。

本系列標準第 3 部基於本標準定義所要求之核心概念,並將其序列化為 XML 格式的使用案例模板、行為者清單,以及詳細要求事項清單。XML 格式係用以將模板內容傳送至其他工程系統(例:UML 建模工具)。此等標準係以能源系統及智慧電網為例所發展,但其足夠一般以轉移至其他領域及系統。未來擬基於本標準發展 UML 剖繪(profile)定義。

IEC 62559-3 - Definition of use case template artefacts into an XML serialized format

Based on IEC 62559-2, IEC 62559-3 defines the required core concepts and their serialization into an XML format of a use case template, an actor list and a list for detailed requirements. The XML format is used to transfer the content of the template to other engineering systems (e.g. UML modelling tools). These documents are developed using the energy system and Smart Grids as examples, but they are general enough to be transferred to other domains and systems. It is intended to develop a UML profile definition based on this part in the future.

## 動機

需國際標準 IEC 62559 “使用案例方法論” 以滿足由 SMB 於 2010 年 2 月會議上所做之 SG3 決定 7 (SMB/4204/DL, Decision 137/10) , 請求針對所有智慧電網(smart grid)應用 , 緊急交付共同使用案例儲存庫。然而 , 本標準中所描述之使用案例方法論係旨在於標準化範圍內超越智慧電網系統的更廣泛應用。

## Motivation

The International Standard IEC 62559 "Use case methodology" is needed to fulfill the SG3 decision 7 made by the SMB at its February 2010 meeting (SMB/4204/DL, Decision 137/10) requesting the urgent delivery of a generic use case repository for all Smart Grid applications. Nevertheless, the use case methodology described in this document is intended for a broader application within standardization exceeding Smart Grid systems.

越加複雜之系統(諸如智慧電網或智慧城市)提出管理系統層級要求事項的問題 , 其須由許多專業領域(與不同技術委員會(TC)相關之標準化)所滿足 , 且須進一步細分並由負責規定標準以支援此等系統級功能之許多 TC 所共享。

有效地處至此橫向性之 1 種方式為設定某些共同方法及用語。使用案例方法論係屬目前最新技術現況 , 且支援進一步工程活動。

More and more complex systems such as Smart Grids or Smart Cities are raising the question of managing system level requirements, which have to be fed by many domains of expertise (in standardization related to different Technical Committees (TCs)), and which have to be broken down further and shared by many TCs in charge of specifying standards to support these system level functions.

One way to handle this transversality efficiently is to set some common methods and terms. The use case methodology is the current state of art and supports further engineering activities.

使用案例方法論提供唯一方式 , 用以於具不同背景之許多專家/TC 間共享新的使用案例或營運案例之想法及要求事項 : 例 : 一方面具能源系統或營運過程知識的領域專家 , 另一方面定義交換資訊及通訊之系統/IT 專家。於要求事項發展過程中 , 領域專家提供一般想法及功能要求事項。主要目標為系統專家將此等使用案例詳細化至可用以規定介面、專屬功能性、資料及服務模型交換之層級。然而 , 人身設備安全或 EMC 專家(作為示例)亦使用所描述之使用案例、用語及所識別的要求事項。

The use case methodology offers a unique way for sharing ideas and requirements of new use cases or business cases between many experts/TC's with different backgrounds: e.g. domain experts with



knowledge about energy systems or business processes on one hand and system-/IT-experts defining exchanged information and communication on the other hand. In the requirement development process, domain experts are providing general ideas and functional requirements. The main goal is for system experts to detail down these use cases to a level they can be used to specify interfaces, dedicated functionality, data and service model exchange. However, safety- or EMC-experts (as examples) may also make use of the described use cases, their terminology and identified requirements.

然而，起始點係於 IEC 內建立一致性框架，幫助 IEC 成員以一致性方式提供使用案例 - 本標準應充當使用案例儲存庫之基礎，以便蒐集、管理、維護並評估使用案例。

於 IEC 內，使用案例儲存庫應用做針對使用案例詳述之共同協作平台，並組織使用案例的調和，以便提供廣泛接受之共同使用案例作為進一步標準化工作的基礎。

However, the starting point is to set up a frame for consistency within IEC helping IEC members to provide use cases in a consistent manner - this standard shall serve as basis for use case repositories in order to gather, administrate, maintain, and evaluate use cases.

Within IEC, a use case repository shall be used as common collaborative platform for use case elaboration and to organize a harmonization of use cases in order to provide broadly accepted generic use cases as basis for further standardization work.

但本標準中所定義之使用案例模板不僅可用於標準的發展，且亦為先前 IEC PAS 62559:2008 (參照本系列標準第 4 部)之最初目的，作為用以實現複雜系統區域內專案的有用手段。此外，需結構化要求事項發展及功能性形式化說明之其他應用亦可使用所建議的模板。

使用案例方法論須看作始於定義營運想法、目標及要求事項之過程，且於使用案例說明中詳述此等內容。此資訊可作為識別/鏈接描述所使用組件之型式的參考架構之基礎，並進一步分析進一步的標準化過程。

But the use case template defined in this document may serve not only for the development of standards, but also - as it was the original purpose of the previous IEC PAS 62559:2008 (refer to IEC 62559-4) - as a helpful means for the realization of projects within the area of complex systems. Also other applications, which need the benefits of a structured requirements development and formalized description of functionality, may make use of the suggested template.

The use case methodology has to be seen as a process which starts with the definition of business ideas, goals and requirements, detailing these in use case descriptions. This information can be used as a basis to identify/link reference architectures describing the types of components used, and going further down to an analysis for the further standardization process.

預期有關使用案例模板之進一步發展。此等發展主要與資訊相關，其係要求於使用案例說明中進行進一步分析，且其能適用至其他資訊(例：參考架構、IT 安全方法、標準及資料模型)。本標準中所建議模板部分地考量此。進一步之關係將分別描述，因其仍於開發中，且可能考量將其用於 IEC 使用案例儲存庫的進一步開發。

Further developments regarding the use case template are expected. These developments are mainly related to information, which is required in the use case description for further analysis, and which can be mapped to other information (e. g. to a reference architecture, IT security methods, standards and data models). Partly this is considered in the suggested template of this standard. Further relations will be described separately as they are still under development and they might be considered for the further development of the IEC use case repository.

## 1. 適用範圍

### 1 Scope

本標準定義使用案例模板之結構、針對行為者(actor)及要求事項的模板清單，以及彼此間之關係。於本標準中，針對各種目的定義用於使用案例之標準化模板，如於標準化組織內用於標準發展或於開發專案中用於系統開發。

This part of IEC 62559 "Use case methodology" defines the structure of a use case template, template lists for actors and requirements, as well as their relation to each other. In this document, a standardized template for the description of use cases is defined for various purposes like the use in standardization organizations for standards development or within development projects for system development.

本標準係針對各種領域及系統中之一般應用所發展。本標準使用能源系統/智慧電網作為示例，因其係此使用案例模板之第 1 個使用區域之一，但此通用模板亦能適用於不同於能源系統的其他使用區域(例：智慧家庭或電氣行動機制)。

This document was developed for general application in various domains and systems. The energy system/smart grid is used as example in this document as it was one of the first usage areas for this use case template, but this general template can be applied in other usage areas different from energy systems as well (e.g. smart home or electro-mobility).

本系列標準第 1 部中描述動機、使用案例之背景資訊、處置使用案例的建議事項(recommendations)，以及用於標準化內部使用案例說明之流程及與中央使用案例儲存庫的關係。

The motivation, background information on use cases, recommendations for the handling of use cases and the processes for the description of use cases inside standardization and in relation to a central use case repository is described in IEC 62559-1.

## 2. 參引標準

### 2. Normative references

無參引標準。

Void

## 3. 用語、定義及縮寫

### 3. Terms. Definitions and abbreviations

本系列標準第 1 部中之用語及定義及下列用語及定義適用於本標準。

For the purposes of this document, the terms and definitions given in IEC 62559-1 and the following apply.

### 3.1 使用案例(use case)

由系統所執行之一組動作的規格，其產生可觀察之結果，該結果針對系統的 1 或多個行為者或其他利害相關者通常有價值。

[來源：ISO/IEC 19505-2:2012 之 16.3.6]

#### 3.1 use case

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

[SOURCE: ISO/IEC 19505-2:2012, 16.3.6]

### 3.2 行為者(actor)

溝通並互動之個體。

備考：此等行為者能包括人員、軟體應用、系統、資料庫，甚至電力系統本身。

[資料：基於 IEC PAS 62559:2008]

#### 3.2 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

[SOURCE: based on IEC PAS 62559:2008]

### 3.3 角色(role)

由行為者於與所討論系統互動中所扮演之角色。

備考 1. 備選方案：角色表示某方之外在預期行為。各方不能共享角色。

例：法律定義之市場參與者(例：電網營運者、用戶)、表示一組可能角色的通用角色(例：彈性營運者)，或針對通用過程及使用案例說明所需之人為定義的主體

備考 2. 法律或一般定義之外部行為者可能藉由其角色命名並識別。

[來源：SG-CG/M490/E:2012-12 之定義 3.17]

#### 3.3 role

role played by an actor in interaction with the system under discussion

Note 1 to entry Alternative: A role represents the external intended behavior of a party. A party cannot share a role.

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

[SOURCE: SG-CG/M490/E:2012-12, definition 3.17]

### **3.4 使用案例模板(use case template)**

容許於預先定義欄位中使用案例之結構化說明的表單。

[資料：SG-CG/M490/E:2012-12 之定義 3]

### **3.4 use case template**

a form which allows the structured description of a use case in predefined fields

[SOURCE: SG-CG/M490/E:2012-12, definition 3]

### **3.5 儲存庫(repository)**

用以儲存諸如使用案例之資訊的處所，通常作為資料庫(指使用案例儲存庫)。

[來源：基於 SG-CG/M490/E:2012-12 之定義 3.12]

### **3.5 repository**

here used for a place where information like use cases can be stored, usually as a database (refer to use case repository)

[SOURCE: based on SG-CG/M490/E:2012-12, definition 3.12]

### **3.6 使用案例儲存庫(use case repository, UCR)**

基於給定之使用案例模板的資料庫，用以編輯、維護並管理使用案例、行為者及要求事項(包括其相互關係)。

備考：UCR 係設計為標準化機構之協作平台，特別配備 UML 模型或文字模板等匯出功能性。

[來源：基於 SG-CG/M490/E:2012-12 之定義 3.13]

### **3.6 use case repository, UCR**

database, based on a given use case template, for editing, maintenance and administration of use cases, actors and requirements including their interrelations

Note 1 to entry: The UCR is designed as collaborative platform for standardization bodies, inter alia equipped with export functionalities as UML model or text template

[SOURCE: based on SG-CG/M490/E:2012-12, definition 3.13]

### **3.7 系統(system)**

於所定義全景中將其視為整體並與其環境分離之一組相互關聯的元件。

備考：系統通常係為達成所給定目標所定義，例：藉由執行明確功能。

[來源：IEC 60050-351:2013, 351-42-08]

### **3.7 system**

set of interrelated elements considered in a defined context as a whole and separated from their environment

Note 1 to entry: A system is generally defined with the view of achieving a given objective, for example by performing a definite function.

[SOURCE: IEC 60050-351:2013, 351-42-08]

### **3.8 區域(area)**

於共同使用案例資料庫內，用以支援使用案例之分群、過濾及行政管理的使用案例之主要使用區域。

例：能源系統/智慧電網、智慧家庭。

備考：可能與進一步劃分區域之領域結合使用。

### **3.8 area**

major usage area for use cases supporting of grouping, filtering and administration of use cases within a common use cases database

EXAMPLE Energy Systems/Smart Grid, Smart Home.

Note 1 to entry: Might be used in combination with domain which further divides an area.

### **3.9 領域(domain)**

由該區域行為者所理解之一組概念及用語為特徵，所特性化的知識或活動之區域。

例：取自智慧電網/能源系統區域：發電、輸電、配電、用戶。

備考：類似技術及組織背景之主要區域，針對能源系統，本標準中建議某些領域作為示例。

[來源：ISO/IEC 19501:2005：統一建模語言規格]

### **3.9 domain**

area of knowledge or activity characterized by a set of concepts and terminology understood by the practitioners in that area

EXAMPLE Taken from Smart Grid/energy system area: Generation, transmission, distribution, customer.

Note 1 to entry: Major area of similar technologies and organisational background, for the energy system some domains are suggested in this document as examples throughout this document.

[SOURCE: ISO/IEC 19501:2005: Unified Modeling Language Specification]

### **3.10 群組/分群(group/grouping)**

行為者之群組，以便組織行為者清單。

例：智慧計量行為者，如電表計營運者(角色)、智慧表計開道器(裝置)。

備考：可能與領域及區域結合使用。

### 3.10 group/grouping

group of actors in order to organize an actor list

EXAMPLE Smart metering actors like meter operator (role), smart meter gateway (devices).

Note 1 to entry: Might be used in combination with domain and area.

### 3.11 分區(zone)

自動化層級，結合參考架構進行分類。

例：SGAM。

### 3.11 zones

automation levels, classified in combination with a reference architecture

EXAMPLE SGAM.

### 3.12 智慧電網架構模型(smart grid architecture model, SGAM)

針對智慧電網區域所建議之參考架構。

[來源：SG-CG/M490/C:2012-12]

### 3.12 smart grid architecture model, SGAM

suggested reference architecture for the smart grid area

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

### 3.13 語意模型(semantic model)

一組資訊之語意的結構化說明，例：使用某些資訊建模語言，如 UML。

備考 1. 許多不同語意模型係相同語意之表示。即使使用 1 種語言(如 UML)，亦有多種方法表示相同種類資訊的結構。

備考 2. 語意建模僅表示訊息內容 - 其不包括格式/編碼(語法)規格。針對所給定之語意模型，通常有許多格式/編碼選項。

[來源：基於 SGAC 語意框架]

### 3.13 semantic model

structured description of the semantics of a set of information, e.g. using some information modeling language like UML

Note 1 to entry: Many different semantic models are expressions of the same semantics. Even with one language, like UML, there are lots of ways to represent the structure of the same kind of information.

Note 2 to entry: Semantic modeling only represents information content - it does not include formatting/encoding (syntactical) specifications. There are typically many formatting/encoding options for a given semantic model.

[SOURCE: based on SGAC Semantic Framework, ~~draft version~~]

### 3.14 正準資料模型(canonical data model, CDM)

所選定語意模型作為單一統一模型，其將治理資料規格之彙集的語意定義，諸如介面之彙集的訊息酬載內容之規格。

[來源：基於 SGAC 語意框架]

### 3.14 canonical data model, CDM

semantic model chosen as the single unifying model that will govern the semantic definition of a collection of data specifications, such as the specifications for message payload content for a collection of interfaces

[SOURCE: based on SGAC Semantic Framework, ~~draft version~~]

### 3.15 名稱空間(namespace)

(標準化)名稱空間限定資訊片段，包括關於其名稱詳細語意之資訊，且通常附加模型(例：正準資料模型)。

### 3.15 namespace

(standardized) space of names qualifying pieces of information, including information about their name detailed semantic, and usually their attached model (e.g. canonical data model)

### 3.16 資訊名稱(name of information)

唯一 ID，其識別於使用案例及其逐步分析之全景中待交換的所選擇資訊，且其宜與名稱空間相關。

### 3.16 name of information

unique ID which identifies the selected information to be exchanged in the context of the use case and its step-by-step analysis and which should be related to the namespace

### 3.17 預設名稱空間(by-default namespace)

預設情況下“資訊名稱”所源自之名稱空間。

### 3.17 by-default namespace

namespace where “name of information” by default originated from

### 3.18 情境(scenario)

可能之相互作用序列。

[來源：SG-CG/M490/E:2012-12 之定義 3.10]

### 3.18 scenario

a possible sequence of interactions

[SOURCE: SG-CG/M490/E:2012-12, definition 3.10]

### 3.19 活動步驟(activity step)



情境內之基本步驟，表示使用案例中互動的最細微說明層級。

[來源：SG-CG/M490/E:2012-12 之定義 3.11]

### 3.19 activity step

elementary step within a scenario representing the finest-grained description level of interactions in the use case

[SOURCE: SG-CG/M490/E:2012-12, definition 3.11]

### 3.20 概念說明(conceptual description)

使用案例之叢集，其能於總體說明中描述，提供簡介並彙總主要想法與叢群的不同高層級使用案例間之關係。

例：智慧電網領域之彈性概念、電氣行動機制(electro-mobility)/智慧電網領域的智慧充電。

### 3.20 conceptual description

cluster of use cases which can be described in an overall description providing an introduction and summarizing the main ideas and the relations between different high level use cases of the cluster  
EXAMPLE Flexibility concept in the Smart Grid area, smart charging in the electro-mobility/SmartGrid area.

### 3.21 叢集(cluster)

一組具相似背景或屬於 1 個系統或 1 個概念說明之使用案例。

[來源：SG-CG/M490/E:2012-12 之定義 3.3]

### 3.21 cluster

group of use cases with a similar background or belonging to one system or one conceptual description

[SOURCE: SG-CG/M490/E:2012-12, definition 3.3]

### 3.22 高層級使用案例(high level use case)

描述獨立於特定技術實現(如架構式解決方案)之一般要求、想法或概念的使用案例。

[來源：SG-CG/M490/E:20 12-12 之定義 3.4]

### 3.22 high level use case

use case which describes a general requirement, idea or concept independently from a specific technical realization like an architectural solution

[SOURCE: SG-CG/M490/E:20 12-12, definition 3.4]

### 3.23 主要使用案例(primary use case)

詳細描述營運過程(一部分)之功能的使用案例。

備考：主要使用案例能與能對映至 1 個架構式解決方案之主要目標或功能相關。

[來源：SG-CG/M490/E:20 12-12 之定義 3.5]

### **3.23 primary use case**

use case which describes in detail the functionality of (a part of) a business process

Note 1 to entry: Primary use cases can be related to a primary goal or function which can be mapped to one architectural solution.

[SOURCE: SG-CG/M490/E:20 12-12, definition 3.5]

### **3.24 次要使用案例(secondary use case)**

可能由其他幾個主要使用案例所使用之基本使用案例。

例：通訊功能。

[來源：SG-CG/M490/E:20 12-12 之定義 3.6]

### **3.24 secondary use case**

elementary use case which may be used by several other primary use cases

EXAMPLE Communication functions

[SOURCE: SG-CG/M490/E:20 12-12, definition 3.6]

### **3.25 通用使用案例(generic use case)**

廣泛接受之標準化使用案例，通常收集並調和不同的單一使用案例，而非基於專案或特定技術之解決方案。

[來源：SG-CG/M490/E:20 12-12 之定義 3.7]

### **3.25 generic use case**

use case which is broadly accepted for standardization, usually collecting and harmonizing different individual use cases without being based on a project or technology-specific solution

[SOURCE: SG-CG/M490/E:20 12-12, definition 3. 7]

### **3.26 特殊化使用案例(specialized use case)**

使用特定技術解決方案/實作之使用案例。

例：具特定介面協定之使用案例。

[來源：SG-CG/M490/E:2012-12 之定義 3.8]

### **3.26 specialized use case**

use case which is using specific technological solutions/implementations

EXAMPLE Use case with a specific interface protocol.

[SOURCE: SG-CG/M490/E:2012-12, definition 3.8]

### **3.27 個別使用案例(individual use case)**

特定於專案或公司/組織內所使用之使用案例。

[來源：SG CG/M490/E:2012-12 之定義 3.9]

**3.27 individual use case**

use case which is used specific for a project or within a company/organization

[SOURCE: SG CG/M490/E:2012-12, definition 3.9]

**3.28 識別碼(identification number, ID)**

表示識別符之值的字串。

例：各使用案例及各要求具 ID。

[來源：IEC 62507-1:2010 之定義 3.5]

**3.28 identification number, ID**

string of characters representing the value of the identifier

EXAMPLE Each use case and each requirement have an ID.

[SOURCE: IEC 62507-1:2010, definition 3.5]

**3.29 識別符(identifier)**

與物件相關聯之屬性，以於所規定領域中明確地識別物件。

[來源：IEC 62507-1:2010，定義 3.8]

**3.29 identifier**

attribute associated with an object to unambiguously identify it in a specified domain

[SOURCE: IEC 62507-1:2010, definition 3.8]

**3.30 要求 ID (requirement ID, R-ID)**

用於模板節次 4 中之要求事項的 ID，以便識別一般要求事項清單中的要求事項。

**3.30 requirement ID, R-ID**

ID for the requirements in template section 4 in order to identify requirements in the general requirements list

**3.31 統一建模語言(unified modeling language, UML)**

用於軟體及其他系統各部分之規格、構造及文件的圖形建模語言。

備考：其範圍極為廣泛，涵蓋大量不同應用領域。

[來源：基於 UML 基礎設施規格 v2.4.1]

**3.31 unified modeling language, UML**

graphical modeling language for the specification, construction, and documentation of parts of software and other systems

Note 1 to entry: It has a very broad scope that covers a large and diverse set of application domains.

~~Note 2 to entry: This note only applies to the French language~~

[SOURCE: Based on UML Infrastructure Specification, v2.4.1]

**4.使用案例之定義**

4.1 概觀

4.1.1 一般

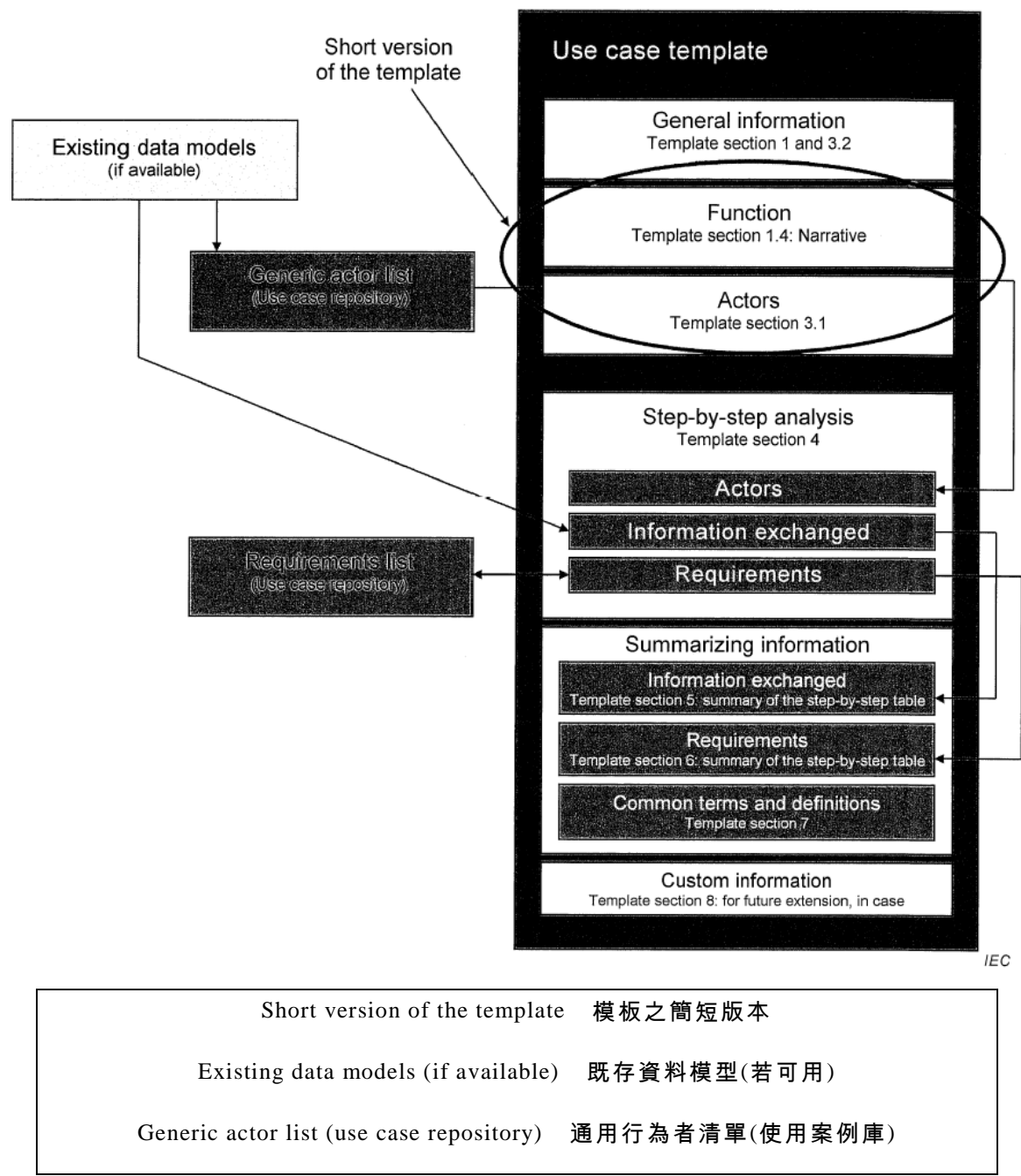
4 Definition of a use case template

4.1 Overview

4.1.1 General

圖 2 提供使用案例模板之概觀及其內部關係，以及與行為者清單及要求事項清單的關係，其共同於所有使用案例。

Figure 2 provides an overview of the use case template and its internal relations as well as the relation to the actor list and the requirements list, which are common for all use cases.



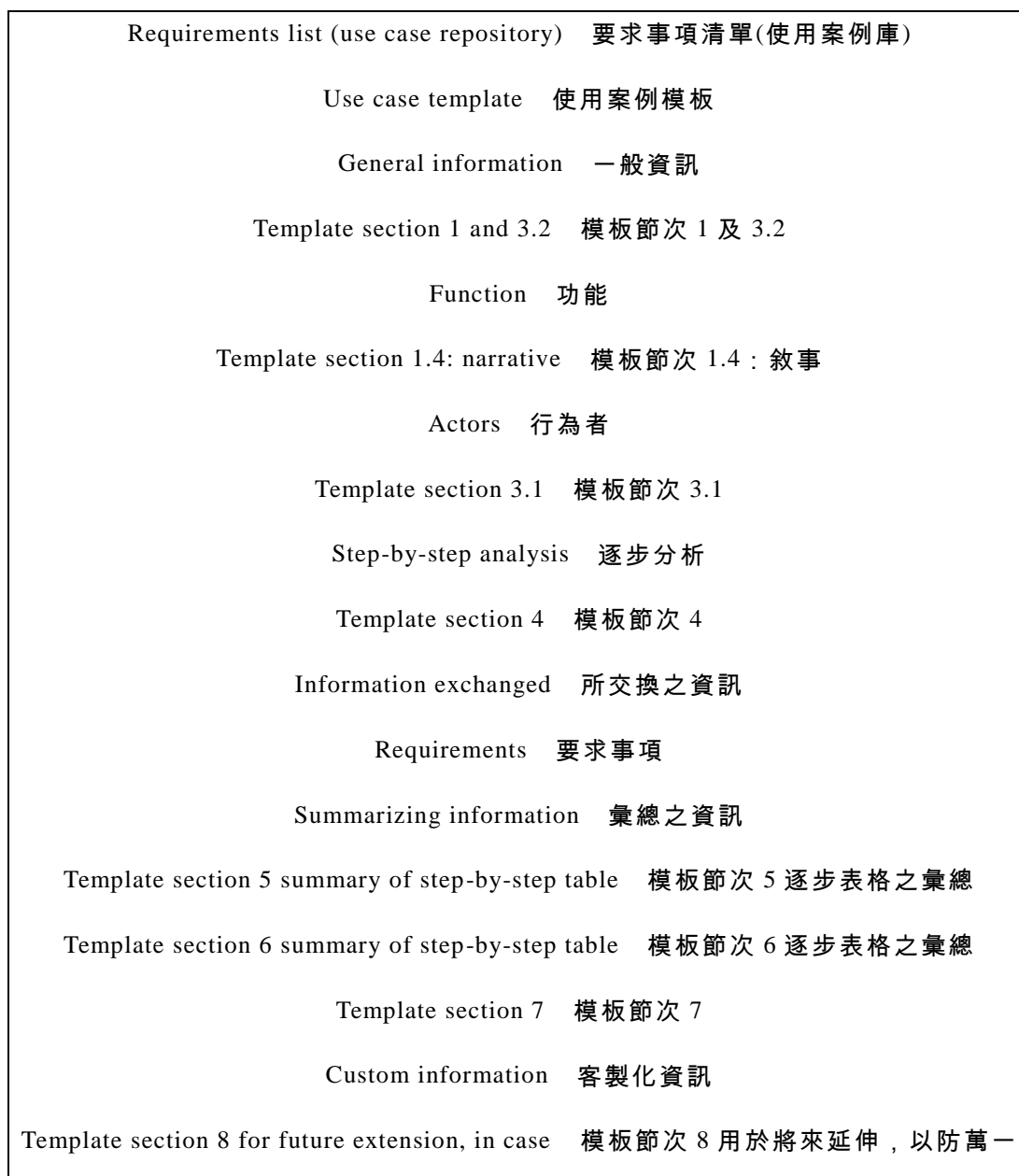


圖 2 使用案例模板概述

Figure 2 - Overview of the use case template

某些欄位要求(宜)預先定義之輸入，用以易於調和並分析使用案例(建議使用標準化清單)。此等建議之答案係於使用案例模板的解說中描述。於工具支援之儲存庫中，選擇預先定義的答案能支援作者。

Some fields require inputs which are/should be predefined for easier harmonization and analysis of use cases (it is recommended to use standardized lists). These recommended answers are described in the explanation of the use case template. In a tool-supported repository, the selection of predefined answers can support the author.

若要求，則既存使用案例說明主要基於類似之模板設計，且能移轉進本標準所定義版本中。於此情況下，要求個別之欄位對映表。

接下來，此模板係首先於 4.2 中定義為空版本。模板及其欄位係於第 5 節中解說。

Existing use case descriptions are mainly based on a similar template design and can be migrated into the defined version of this standard, if required. In this case, an individual mapping table for the fields is required.

In the following, the template is defined being first provided as empty version in 4.2 below. The template and its fields are explained in Clause 5.

#### 4.1.2 簡短模板版本及使用案例概觀表格

##### 4.1.2 Short template version and use case overview table

僅下列欄位係屬必備，涵蓋使用案例之最小簡短版本，其係主要用於新使用案例的第 1 個版本：

- 使用案例名稱。
- 作者。
- 日期。
- 敘事(narrative)。
- 行為者。

Only the following fields are mandatory covering the minimum short version of a use case which is mainly used for a first version of a new use case:

- name of use case,
- author,
- date,
- narrative,
- actors.

簡短版本係完整使用案例之基礎，且能以新增進一步資訊以簡單地延伸，亦即無需重新編寫使用案例。由於不言自明，簡短版本係視為針對領域專家之簡單起始點，而無需深入探討使用案例方法論及其完整使用案例模板的每個細節。

The short version is the basis for the complete use case and can simply be extended with the addition of further information, i.e. without rewriting the use case. Being self-explaining, the short version is seen as an easy starting point for domain experts without going into every detail of the use case methodology and its complete use case template.

使用案例能顯示於簡要概觀表中(每使用案例單一行)。其能用於將可能之使用案例的完整清單範圍限制為表格彙總。然後，例：能使用簡短模板抑或長模板識別並延伸最重要之使用案例。

Use cases can be displayed in a brief overview table (single row per use case). It can be used to scope the full list of possible use cases as tabular summary. Then, for instance, the most important use cases can be identified and expanded using either the short or long template.

使用案例之名稱 Name of use case	簡短說明 Short description	行為者 Actors	一般備註 General remarks
第 1 個使用案例 First use case			
下個使用案例 Next use case			
...			

例：參照附錄 B。可能於個別需求上定義進一步版本，但建議使用本標準中描述之所提供欄位及其定義，以便與其他使用案例說明、工具及儲存庫相容。

For examples, refer to Annex B. Further versions may be defined on individual demand, but it is recommend to use the provided fields and their definitions described in this document in order to be compatible with other use cases descriptions, tools, and repositories.

#### 4.1.3 行為者清單及要求事項清單

##### 4.1.3 Actor list and requirements list

依循模板之解說，行為者清單及要求事項清單係每欄位的預先定義答案，以便調和源自不同來源之各種使用案例中的資訊。於標準化中，此等清單實際上可於 IEC 使用案例儲存庫中取得。本系列標準第 1 部中描述驗核新資訊之過程。

Following the explanation of the template, an actor list and a requirements list are pre-defining answers for the respective fields in order to harmonize information in various use cases from different sources. In standardization, the lists are virtually made available in the IEC use case repository. A process for validating new information is described in IEC 62559-1.

#### 4.1.4 使用案例庫

##### 4.1.4 Use case repository

此模板可能於文字處理軟體中使用，但使用儲存庫提供幾個優點：維護、使用案例間之概觀/相互關係、用於工作小組或社群的共同基礎、使用案例專家之支援提供相關的資

訊，如行為者、要求事項等。此外，儲存庫能提供具預先定義答案之選擇框，容許易於開始使用簡短版本，易於移轉至模板的新版本/不同版本之一致使用(例：簡短及更詳細)資訊對映、特別報告/觀點的設計等。

The template may be used in a word processing software, but using a repository provides several advantages: maintenance, overview of/interrelation between use cases, common basis for working groups or communities, support of the use case experts providing already relevant information like actors, requirements, etc. In addition to that, a repository can provide selection boxes with predefined answer, allow an easier start using the short version, easier migration to new versions of the template/consistent use of different versions (e.g. short and more detailed), mapping of information, design of special reports/views, etc.

一般而言，與使用案例相關之所有資訊能整合於既存模板及其所定義的欄位中。儘管如此，模板之節次 8 提供未來個別延伸之選項。強烈建議使用既存欄位，以便與 UCR 等共同使用案例工具互運。

In general, all information related to the use case can be integrated into the existing template and its defined fields. Nevertheless, section 8 of the template provides options for future individual extension. It is strongly recommended to use existing fields in order to be interoperable with general use case tools like the UCR.

針對官方 IEC 模板(及儲存庫)，模板節次 8 之欄位能用於未來調整，直至發布該標準的新版本。本系列標準第 1 部提供新欄位之請求及驗核過程。於 IEC 內部使用之新欄位應對負責的委員會公布，並應於使用前依本系列標準第 1 部中所描述之程序確認。

For the official IEC template (and repository) fields of template section 8 can be used for future adaptations until a new version of this standard is issued. IEC 62559-1 provides a process for the request and validation of new fields. New fields for the use inside the IEC shall be announced to the responsible committee and shall be acknowledged according to the procedure described in IEC 62559-1, prior to use.

## 4.2 使用案例模板

### 4.2 Use case template

下列概觀提供空模板。該模板係於第 5 節中解說。

The following overview provides the empty template. The template is explained in Clause 5.

#### 1. 使用案例之說明

##### 1.1 使用案例之名稱



*1 Description of the use case**1.1 Name of use case*

使用案例識別 Use case identification		
ID	區域/領域/分區 Area/Domain(s)/Zone(s)	使用案例之名稱 Name of use case

**1.2 版本管理***1.2 Version management*

版本管理 Version management				
版本編號 Version No.	日期 Date	作者之名稱 Name of author(s)	變更 Changes	核可狀態 Approval status

**1.3 使用案例適用範圍及目標***1.3 Scope and objectives of use case*

使用案例適用範圍及目標 Scope and objectives of use case	
適用範圍 Scope	
目標 Objective(s)	
相關之營運案例 Related business case(s)	

**1.4 使用案例之敘事***1.4 Narrative of use case*

使用案例之敘事 Narrative of use case
簡短說明 Short description

完整說明
Complete description

### 1.5 關鍵效能指標(KPI)

#### 1.5 Key performance indicators (KPI)

關鍵效能指標			
Key performance indicators			
ID	名稱 Name	說明 Description	對所提及使用案例目標之參引 Reference to mentioned use case objectives

### 1.6 使用案例條件

#### 1.6 Use case conditions

使用案例條件	
Use case conditions	
假設 Assumptions	
先設條件 Prerequisites	

### 1.7 分類/對映使用案例之進一步資訊

#### 1.7 Further information to the use case for classification/mapping

分類資訊	
Classification information	
對其他使用案例之關係 Relation to other use cases	

深度之層級 Level of depth
優先序化 Prioritisation
通用、地區(regional)或國家關係 Generic, regional or national relation
使用案例之本質 Nature of the use case
用以分類之進一步關鍵詞 Further keywords for classification

### 1.8 一般備註

#### 1.8 General remarks

一般備註 General remarks

### 2. 使用案例之圖表

#### 2 Diagrams of use case

使用案例之圖表 Diagram(s) of use case

### 3. 技術細節

#### 3.1 行為者

##### 3 Technical details

##### 3.1 Actors

行為者 Actors
---------------

分群 Grouping		群組說明 Group description	
行為者名稱 Actor name	行為者型式 Actor type	行為者說明 Actor description	特定於此案例之進一步資訊 Further information specific to this use case

### 3.2 參引

#### 3.2 References

參引 Reference						
編號 No.	參引型式 Reference type	參引 Reference	狀態 Status	使用案例上之影響 Impact on use case	發起者/組織 Originator/ organisation	鏈接 Link

## 4. 使用案例之逐步分析

### 4.1 情境之概觀

#### 4 Step by step analysis of use case

##### 4.1 Overview of scenarios

情境條件 Scenario conditions						
編號 No.	情境名稱 Scenario name	情境說明 Scenario description	主要行為者 Primary actor	觸發事件 Triggering event	先設條件 Pre-condition	後設條件 Post-condition

### 4.2 步驟 - 情境

#### 4.2 Steps – Scenarios

Scenario
----------

情境								
情境名稱 Scenario name		編號 1 至... No. 1 - ...						
步驟 編號 Step No.	事件 event	過程/活動 之名稱 Name of process/ activity	過程/活動 之說明 Description of process/ activity	服務 service	資訊產生 者(行為者) Informa- tion producer (actor)	資訊接收 者(行為者) Informa- tion receiver (actor)	所交換之 資訊(ID) Informa- tion exchanged (IDs)	要求、R- ID Require- ment, R- IDs

## 5. 所交換之資訊

### 5 Information exchanged

所交換之資訊 Informa-tion exchanged			
所交換之資訊(ID) Informa-tion exchanged (IDs)	資訊之名稱 Name of information	所交換資訊之說明 Description of information exchanged	要求、R-ID Require-ment, R-IDs

## 6. 要求事項(選項)

### 6 Requirements (optional)

要求事項(選項) Requirements (optional)		
種類 ID Categories ID	用於要求事項之種類名稱 Category name for requirements	種類說明 Category description
要求 R-ID Requirement R-ID	要求名稱 Requirement name	要求說明 Requirement description

## 7. 共同用語及定義

### 7 Common terms and definitions

共同用語及定義 common terms and definitions	
用語 Term	定義 definition

## 8. 客製化資訊(選項)

## 8 Custom information (optional)

客製化資訊(選項) Custom information (optional)		
關鍵詞 Key	客製化資訊 Custom information	值參引之節次 Value Refers to section

## 5. 使用案例模板欄位之解說

## 5 Explanation of fields of the use case template

於第 5 節中，使用案例模板之各表格提供表格儲存格內容的說明。若有用，則提供有關此內容之某些額外資訊。

模板之不同部分以灰色背景標記，以便與本標準的節次區分。

## 模板節次：1 使用案例說明

## 模板節次：1.1 使用案例名稱

In Clause 5, each table of the use case template is presented with descriptions of the content of the table cells. Some additional information about this content is presented where helpful.

Different sections of the template are marked with grey background in order to differentiate from clauses of this document.

## Template section: 1 Description of the use case

## Template section: 1.1 Name of use case

使用案例識別 Use case identification		
ID	區域/領域/分區 Area/Domain(s)/Zone(s)	使用案例之名稱 Name of use case

ID：使用案例之識別碼(ID)於儲存庫或專案中係屬唯一，用於使用案例的組織/行政管理。

區域/領域/分區：使用案例能用於各種區域(例：能源系統)。於此等區域內，不同之領域係用以定義/確定更特定的子分群。分區可額外地描述自動化系統或參考架構內之分區。特定領域中之專家能建議其領域(及區域)集，以便就如何分群複雜區域內的使用案例達成共識。此等預先定義之領域(及分區)能由使用案例的作者選定(預選)。作者能選擇 1 或多個領域及分區，以逗號分隔，因其係通常跨越不同領域及分區。

ID: The identification number (ID) of a use case is unique within a repository or project and serves for organization/administration of use cases.

Area/Domain(s)/Zone(s): Use cases can be used in various areas (e.g. energy system). Within these areas, different domains are used to define/determine a more specific subgrouping. Zones might describe additionally zones within an automation system or a reference architecture. Experts in a particular field can suggest their set of domains (and zones) in order to provide a common understanding how to group use cases within an complex area. These predefined domains (and zones) can be chosen by the author of a use case (preselection). The author can select one or more domains and zones, comma separated, as it is usual that use cases are crossing different domains and zones.

例：針對依智慧電網架構模型(SGAM)之能源系統，建議下列領域及分區：

區域：能源系統

領域：

- 發電。
- 輸電系統。
- 配電系統。
- 分散式能源(DER)。
- 用戶。

EXAMPLE For the energy system according to the smart grid architecture model (SGAM), the following domains and zones are suggested:

Area: Energy systems

Domains:

- Generation
- Transmission system:
- Distribution system
- Distributed Energy Resources (DER)
- Customers

分區：

- 市場。
- 企業。
- 運作。
- 站所。
- 現場。
- 過程。

Zones:

- Market
- Enterprise
- Operation
- Station
- Field
- Process

將 SGAM 示例轉移至其他區域須相應地採用領域，假設該等分區可能對其他區域有效。

使用案例之名稱：簡短名稱，其於區域/領域內宜為唯一，且其宜使用“動詞+說明”參引使用案例本身之活動。

例：判定變電所層級之電能平衡。

#### 模板節次：1.2 版本管理

此 1.2 係與版本管理及關於作者之資訊相關。

Transferring the SGAM example to other areas the domains have to be adopted accordingly, it is assumed that the zones might be valid for other areas as well.

Name of use case: A short name, which should be unique within the area/domain and which refers to the activity of the use case itself using "Verb + description" should be used.

EXAMPLE Determine energy balance on substation level.

#### Template Section: 1.2 Version management

This section 1.2 is related to a version management and information about authors.

版本管理				
Version management				
版本編號	日期	作者之名稱	變更	核可狀態
Version No	Date	Name of author(s)	Changes	Approval status




版本編號：識別文件版本之序號。

日期：版本建立之日期。

作者之名稱：此欄位係用於登載提供目前版本者。其能為個人、組織或例：標準化委員會，如 TC 或 WG。

Version number: Sequential number to identify the version of the document.

Date: Date, when the version was created.

Name of author(s): This field is used to document who has provided the current version. It can be a person, organization or e.g. standardization committee like TC or WG.

變更：當變更使用案例時，一般變更宜簡短地登載於“變更”欄中，多個變更係段落分隔。

核可狀態：將於標準化組織內使用。使用案例或行為者之驗核程序將定義於本標準第 1 部中。

Changes: When changing the use case, general changes shall be documented shortly in the column "Changes", multiple changes are separated with paragraphs.

Approval status: will be used within the standardization organizations. The procedures for validation of use cases or actors will be defined in part 1 of this standard.

例：類似於工作草案(類似 FDIS)、徵求意見之最終委員會草案(CD)、用於投票的委員會草案(CDV)、用於投票(類似 FDIS)、最終草案。

### 模板節次：1.3 使用案例之適用範圍及目標

此處描述此使用案例之背景或動機。

EXAMPLE Similar to working draft, (similar FDIS), final committee draft (CD) for comments, committee draft for vote (CDV), for voting (similar FDIS), final.

#### Template section: 1.3 Scope and objective of use case

Here the background or motivation of this use case is described.

使用案例之適用範圍及目標 Scope and objectives of use case	
適用範圍 Scope	
目標 Objective(s)	

相關之營運案例 Related business case(s)	
-------------------------------------	--

適用範圍：適用範圍定義使用案例之限制。

目標：使用案例之目標清單。

相關之營運案例：提供具某些針對所建議使用案例之理由闡述的說明或參引。通常，營運案例係與多個使用案例相關。因此，外部參引或營運案例/營運要求事項之鏈接可能更有效，且能於此處新增。或者，其可能於此欄位中描述。亦參照模板節次 3.2。

#### 模板節次：1.4 使用案例敘事

Scope: The scope defines the limits of the use case.

Objective: List of objectives of the use case.

Related business case(s): Provides a description or reference with some rationale for the suggested use case. Usually the business case is related to several use cases. Therefore an external reference or link to a business case/business requirements might be more efficient and can be added here. Alternatively it may be described in this field. Refer also to template section 3.2.

#### Template section: 1.4 Narrative of use case

使用案例之敘事 Narrative of use case
簡短說明 Short description
完整說明 Complete description

簡短說明：簡短文字旨在彙總主要想法，為正搜尋使用案例或尋找概觀之讀者提供服務。

建議：此簡短說明不應超過 150 個字。

完整說明：自使用者觀點提供使用案例之完整敘事，描述何時、為何、期望什麼，以及於何種條件下發生什麼。此敘事宜以純文字形式編寫，以便非領域專家能理解。

Short description: Short text intended to summarize the main idea as service for the reader who is searching for a use case or looking for an overview.

Recommendation: This short description should have not more than 150 words.

Complete description: Provides a complete narrative of the use case from a user's point of view, describing what OCCURS when, why, with what expectation, and under what conditions. This narrative should be written in plain text so that non-domain experts can understand it.

完整說明之長度能自幾句話至幾頁不等，取決於使用案例的複雜性及/或新穎性。此說明通常有助於領域專家於深入瞭解使用案例模板之下個節次中的詳細資訊前，反思使用案例的要求事項。

說明可包括用於解說之附圖(UML 圖請參照節次 2)。

#### 模板節次：1.5 關鍵效能指標(KPI)

The length of the complete description can range from a few sentences to a few pages, depending on the complexity and/or newness of the use case. This description often helps the domain expert to reflect about the requirements for the use case before getting into the details in the next sections of the use case template.

The description may include drawings for explanation (for UML diagrams refer to section 2)

#### Template section: 1.5 Key performance indicators (KPI)

關鍵效能指標			
Key performance indicators			
ID	名稱 Name	說明 Description	對所提及使用案例目標之參引 Reference to mentioned use case objectives

ID：關鍵效能指標(KPI)之唯一識別符。

名稱：描述 KPI 之簡短名稱。

例：增加駐存容量 DER。

說明：說明規定 KPI，且可包括與使用案例目標之一相關的特定目標及此等目標的計算。

ID: Unique identifier for the Key Performance Indicator (KPI).

Name: Short name that describes the KPI.

EXAMPLE Increased Hosting Capacity DER.

Description: The description specifies the KPI and may include specific targets in relation to one of the objectives of the use case and the calculation of these targets.

例：使用系統平均中斷持續時間指數 SAIDI 之計算，將系統可用性改善 10%。

對所提及使用案例目標之參引：此處係先前於目標及 KPI 中所規定的標的之一的鏈接。

例：供應之安全性。

#### 模板節次：1.6 使用案例條件

EXAMPLE Improve system availability by 10 %, using the calculation of SAIDI, System Average Interruption Duration Index.

Reference to mentioned use case objectives: Here is the link to one of the objective which are specified in the targets and the KPI before.

EXAMPLE Security of supply.

#### Template section: 1.6 Use case conditions

使用案例條件 Use case conditions	
假設 Assumptions	
1	
...	
n	

先設條件 prerequisites	
1	
...	
m	

假設：可能用以進一步定義此使用案例之一般假設。

於某些使用案例中，瞭解正做出哪些先設條件或其他假設至關重要。

- 應識別任何假設，諸如：哪些系統已存在，哪些契約關係存在，以及哪些系統組態可能已到位。
- 應識別下個節次中之步驟中所交換資訊的任何初始狀態。

Assumption: May be used to define further, general assumption for this use case.

In some use cases, it is critical to understand which preconditions or other assumptions are being made.

- Any assumptions shall be identified, such as: which systems already exist, which contractual relations exist, and which configurations of systems are probably in place.
- Any initial states of information exchanged in the steps in the next section shall be identified.

先設條件：描述於啟動使用案例之前宜滿足哪些條件，諸如行為者及活動的先前狀態。

**模板節次：1.7 分類/對映使用案例之進一步更多資訊**

此節次 1.7 提供用以分類或對映使用案例之額外資訊。

Prerequisites: Describes what condition(s) should have been met prior to the initiation of the use case, such as prior state of the actors and activities.

**Template section: 1.7 Further information to the use case for classification/mapping**

This section 1.7 provides additional information used to classify or map the use case.

分類資訊 Classification information
對其他使用案例之關係 Relation to other use case

對其他使用案例之關係：例：若使用案例係與高層及使用案例相關之更詳細的使用案例，或其係既存使用案例之替代方案，則能於此處提供與其他使用案例的已知關係。可使用如“include”、“extends”、“invokes”之關係的型式，更詳細地規定該關係。

Relation to other use cases: Known relations to other use cases can be provided here if e.g. the use case is a more detailed one related to a high level use case, or it is an alternative to an existing use case. The type of relation like “include”, “extends”, “invokes” might be used in order to specify this relation in more detail.

深度之層級 Level of depth

深度之層級：能於不同層級上描述使用案例(例：參照 IEC62559-1)。目前，針對所定義之使用案例無固定的階層，但提供某些最常見之示例。

例：高層級使用案例、通用使用案例、特殊化使用案例。

Level of depth: Use cases can be described on different levels (refer to IEC62559-1 for examples). Currently there is no fixed hierarchy for use cases defined, but some most common examples are provided.

EXAMPLE High level use case, generic use case, specialised use cases.

優先序化 Prioritisation

優先序化：考量大量使用案例，可能關注依優先序對其叢集。

此優先序話可能因國家/地區而異。

例：

- 強制性/必備、選項、有就好。
- 就標準化觀點之政治標的/營運需要/優先序。
- 部署/時機、效益、對新挑戰之答案的時間尺度。

Prioritisation: Considering a larger number of use cases it might be interesting to cluster them according to priority.

This prioritisation might be different from country to country.

#### EXAMPLES

- *Obligatory/mandatory, optional, nice to have.*
- *Political target/business need/prioritization from standardization point of view.*
- *Time scale to deployment/timing, benefit, answer to new challenges.*

通用、地區或國家關係
Generic, regional or national relation

通用、地區或國家關係：於國際層級上，使用案例說明可能足夠通用以更一般之方式描述使用案例，獨立於國家或地區市場設計。但使用案例可能用以描述地區或國家之特定情況，如法律，甚至專案特定的細節。若使用案例反映此等情況，則宜相應地特性化。

例：國家、“Country”。

Generic, regional or national relation: On international level, the use case description might be generic enough to describe a use case in a more general way independently from the national or regional market design. But use cases might be used to describe regional or national specific circumstances like laws or even project-specific details. If the use case reflects those circumstances, it should be characterized accordingly.

EXAMPLE National, "Country".

使用案例之本質
Nature of the use case

使用案例之本質：此欄位能有助於分類使用案例之主要焦點。

例：技術/系統使用案例、營運使用案例(例：市場過程)、政治、測試使用案例。

Nature of the use case: This field can help to classify the main focus of the use case.

EXAMPLE Technical/system use case, business use cases (e.g. market processes), political, test use cases.

用以分類之進一步關鍵詞 Further keywords for classification

用以分類之其他關鍵詞：能定義關鍵詞以支援使用案例儲存庫內之延伸搜尋功能。宜以逗號分隔清單之形式提供多個關鍵詞。

例：智慧電網、電動車輛、車輛裝載、電力計量、儲能。

#### 模板節次：1.8 一般備註

Further keywords for classification: Keywords can be defined in order to support extended search functionalities within a use case repository. Multiple keywords should be provided as a comma-separated list.

EXAMPLE Smart grid, electric vehicles, loading of vehicles, electricity metering, storage.

#### Template section: 1.8 General remarks

一般備註 General remarks

一般備註：用於他處未考量之進一步備註。

#### 模板節次：2 個使用案例之圖表

General remarks: Is used for further comments which are not considered elsewhere.

#### Template section: 2 Diagrams of use case

使用案例之圖表 <i>Diagram(s) of use case</i>

使用案例之圖表：為清楚起見，通常建議藉由手工、圖形或 UML 圖形(此節次 2 中的首選)提供繪圖。繪圖宜顯示可能識別步驟之互動。

例：使用案例圖、序列圖、活動圖等。

#### 模板節次：3 技術細節

Diagram of use case: For clarification, in general it is recommended to provide drawing(s) by hand, by a graphic or as UML graphics (preferred in this section 2). The drawing should show

interactions which identify the steps where possible.

EXAMPLES Use case diagram, sequence diagram, activity diagram, others.

### Template section: 3 Technical details

於下列節次 3.1 至 3.2 中，提供使用案例之細節。

#### 模板節次：3.1 行為者

於此節次 3.1 中，列出並描述使用案例中所涉及之行為者。例：此等能包括人員、系統、應用、資料庫、裝置等。

In the following sections 3.1 to 3.2, details of the use case are provided.

#### Template section: 3.1 Actors

In this section 3.1, actors which are involved in the use case are listed and described. These can for instance include people, systems, applications, databases, devices, etc.

行為者 Actors	
分群 Grouping	群組說明 Group description

分群：能分群行為者清單，以便為每“分群”使用 1 個表格(分群之名稱及其說明)提供較佳概觀及檢索。該表將依所識別之群組數複製。

命名規約：針對複雜之分群，群組名稱能為“點分隔”。

例：(area.domain.)main.sub.subsub。該分群可依循模板節次 1.1 中所建議之領域/分區。

群組說明：群組之簡要說明。若給予標準化分群名稱，此能藉由軟體工具自動完成。

Grouping: The actor list can be grouped in order to provide a better overview and retrieval using one table per “grouping” (name of grouping and its description). The table will be copied according to the number of groups identified.

Naming convention: For complex groupings, the group name can be “dot-delimited”.

EXAMPLE (area.domain.) main.sub.subsub. The grouping may follow the suggested domains/zones in section 1.1 of the template.

**Group description**: Brief description of the group. This can be automatically completed by software tools, if a standardized grouping name is given.

行為者名稱 Actor name	行為者型式 Actor type	行為者說明 Actor description	特定於此使用案例之進一步資訊 Further information specific to this use case




行為者名稱、行為者型式及行為者說明欄位：參照本標準的第 6 節。

於第 6 節中，建議具預先定義行為者之進一步文件。於 1 個儲存庫(例：IEC 儲存庫 - 參照本系列標準第 1 部)中，宜優先行為者清單中之行為者。於此情況下，型式及說明無須再次填寫。於使用案例儲存庫中，整合行為者清單。能針對整個行為者名單定義並建議缺失之行為者。名單之目的係限制使用相似名稱的行為者數量加倍。針對使用案例儲存庫之分類、搜尋功能及進一步服務，提供預先定義的行為者將極有用。

Fields actor name, actor type, actor description: Refer to Clause 6 of this document.

In Clause 6, a further document with predefined actors is suggested. Within one repository (e.g. an IEC repository - refer to IEC 62559-1) actors from the actor list should be preferred. In this case, type and description have not to be filled in again. In the use case repository, an actor list is integrated. Missing actors can be defined and suggested for the overall actor list. The aim of the list is to limit the amount of actors which are doubled using similar names. For classification, search function and further services of a use case repository, it will be very useful to provide predefined actors.

但使用案例的作者不應受限制，因此其可定義自有行為者。於此情況下，應分類(型式)並描述行為者。

應確保於整個文件中(特別於行為者定義標籤情境條件、先設條件、假設及情境中)一致使用此表中列出行為者名稱。若未使用儲存庫中之自動選擇框，則作者應檢查其說明的常見大寫、用法上之細微差異、縮寫相對於整個字詞(亦即 ESP 及其他能源服務提供者)等。

But the author of a use case shall not be restricted so it may define an own actor. In this case, the actor shall be classified (type) and described.

It shall be ensured that the names of the actors as listed in this table are consistently used throughout the document (specifically in the actors definitions tab scenario conditions, preconditions and assumptions and scenarios). If not using an automatic selection box in the repository, writers shall check their descriptions for common capitalization, small differences in usage, abbreviations vs. whole words (i.e. ESP and elsewhere Energy Service Provider), etc.

特定於此使用案例之進一步資訊：能提供與該使用案例相關之個別或額外資訊。

例：參引如 SGAM 之參考架構。

Further information specific to this use case: Individual or additional information that relates

to the use case can be provided.

EXAMPLE Reference to a reference architecture like SGAM.

## 模板節次：3.2 參引

## Template section: 3.2 References

參引 References						
編號 No.	參引型式 References type	參引 Reference	狀態 Status	使用案例上之 影響 Impact on use case	發起者/組織 Originator/ organisation	鏈接 Link
	來源/文獻及相關鏈接 Source(s)/ Literature with relevant link	此使用案例源自 1 或多個既存來源？ Is the use case taken from one or several existing source?		例：著作權、 IPR。 e.g. copy right. IPR	擁有者/作者 Owner/author	網路上公開可用？ Publicly available in the web?
	標準 Standards	是否已有標準可用以支援使用案例？是否存在與使用案例相關但須修改之標準？ Are there already standards available to support the use case? Are there standards existing related to use case but have to be modified?	例：NP、CD、CDV、FDIS、IS。		是否已有委員會參與此使用案例？能將使用案例指派予負責該使用案例之委員會？此資訊對差距分析及工作計畫之定義係屬重要。 Is there already a committee involved in this use case? Can	

					the use case be assigned to a committee being responsible for the use case? This information will be important for the gap analysis and the definition of a work program.	
	法律 Laws					
	契約 Contracts					
	法規 Regulations					
	要求事項之清單 List of requirements	有關要求事項，參照第 7 節定義 Refer to Clause 7 Definition of a list for requirements				
	行為者清單 Actor list	有關行為者清單，參照第 6 節定義 Refer to clause 6 definition of an actor list				
	預設名稱空間	標準參引				

	By-default namespace	Standard reference				
	相關之營運案例(參引 模板節次 1.3) Related business case (refer to section 1.3 of the template)					
	其他參引議題 Other references issues					

編號：此參引號可用於使用案例本身之參引；例：使用[編號](可能由儲存庫工具或文字處理軟體支援)。

參引型式：如上例所示，有不同參考文獻型式(例：標準、法規、契約、出版物等其他文獻)。

No: This reference number might be used for referencing in the use case itself; e.g., using [No.] (may be supported by a repository tool or a word processing software).

References type: There are different reference types as shown in the examples above (e.g. standards, regulation, contract, others like publications).

參引：應識別可限制或影響使用案例之設計、理解及要求事項的任何參引，包括契約、法規、政策、財務考量、工程限制事項(constraint)、污染限制事項，以及其他環境品質問題。

狀態：所參引文件之狀態。

Reference: Any references shall be identified that might restrict or affect the design, understanding, and requirements of the use case, including contracts, regulations, policies, financial considerations, engineering constraints, pollution constraints, and other environmental quality issues.

Status: The status of the referenced document.

使用案例上之影響：文件於何處影響使用案例？

發起者/組織：誰發布該文件？

鏈接：若可用，能提供公眾鏈接(例：標準之 IEC 網路商店)。

Impact on use case: Where does the document influence the use case?

originator/organisation: Who published the document?

Link: If available, a public link can be provided (e.g. to the IEC webstore for standards).

例：係於上表中提供。

若適用，此能針對高層級使用案例描述一次，而非針對每一詳細使用案例再次描述：例：針對智慧計量所需之法規、法律等能於分離的文件或更高層級之使用案例中描述一次，然後能於其他使用案例中參引。於此情況下，1 個參引即足夠。

EXAMPLES Are provided in the table above.

If applicable, this can be described once for a high level use case and not for every detailed use case again: e.g. regulations, laws etc. which are needed for smart metering can be described in a separate document or in a higher level use case once, and then they can be referenced in other use cases. In this case, one reference is sufficient.

**模板節次：4 使用案例的逐步分析****模板節次：4.1 情境概觀**

模板節次 4 聚焦於以逐步分析(序列說明)描述使用案例之情境。

敘事與此等情境及步驟間宜有明確之相關性。

**Template section: 4 Step by step analysis of use case****Template section: 4.1 Overview of scenarios**

Template section 4 focuses on describing scenarios of the use case with a step-step analysis (sequence description).

There should be a clear correlation between the narrative and these scenarios and steps.

情境條件						
Scenario conditions						
編號 No.	情境名稱 Scenario name	情境說明 Scenario description	主要行為者 Primary actor	觸發事件 Triggering event	先設條件 Pre-condition	後設條件 Post-condition

表格提供使用案例之不同情境的概觀，如模板節次 4.2 中所描述之正常及替代情境。

一般而言，使用案例之編寫者自正常序列(成功)開始。若前設條件或後設條件未提供預期輸出(例：no success = failure)，則須定義替代方案。

The table provides an overview of the different scenarios of the use case like normal and alternative scenarios which are described in section 4.2 of the template.

In general, the writer of the use case starts with the normal sequence (success). In case pre-condition or post-condition does not provide the expected output (e.g. no success = failure), alternative scenarios have to be defined.

編號：情境係循序地編號。情境之數目未受限。

情境名稱：用以命名情境。

情境說明：用以簡短地描述情境。主要行為者描述哪些行為者觸發此情境。

觸發事件：描述哪些事件觸發此情境。

No: The scenarios are sequentially numbered. The number of scenarios is not limited.

Scenario name: is used to name the scenario.

Scenario description: is used to describe shortly the scenario. Primary actor describes which actor(s) trigger(s) this scenario.

Triggering event: describes which event(s) trigger(s) this scenario.

前設條件：描述於此情況發生前宜滿足哪些條件。

後設條件：描述於此情況發生後哪些條件宜優先。後設條件針對各使用案例亦可定義“成功”或“不成功”條件。

#### 模板節次：4.2 步驟 - 情境

Pre-condition: describes which condition(s) should have been met before this scenario happens.

Post-condition: describes which condition(s) should prevail after this scenario happens. The post conditions may also define "success" or "failure" conditions for each use case.

#### Template section: 4.2 Steps - Scenarios

情境條件 Scenario conditions								
情境名稱： Scenario name:		編號 1 至... No. 1 - ...						
步驟 編號 Step No.	事件 Event	過程 / 活動之名稱 Name of process/activity	過程 / 活動之說明 Description of process/activity	服務 Service	資訊產生者(行為者) Information producer (actor)	資訊接收者(行為者) Information receiver (actor)	所交換之資訊(ID) Information exchanged (IDs)	要求、R-ID Requirement, R-IDs

針對此場景，應使用簡單動詞(例：get、put、cancel、subscribe 等)自起始至結束描述所執行之所有步驟。步驟應循序地編號 - 1、2、3 等。若需要，能將更多步驟新增至表格(步驟數量未受限制)。

若場景要求詳細說明其他使用案例亦使用之步驟，則宜考量建立新的“子”使用案例，然後於該場景中參引該“子常式”。

步驟編號：識別該步驟之序號。

For this scenario, all the steps performed shall be described going from start to end using simple



verbs like – get, put, cancel, subscribe etc. Steps shall be numbered sequentially - 1, 2, 3 and so on. Further steps can be added to the tab, if needed (number of steps are not limited).

Should the scenario require detailed descriptions of steps that are also used by other use cases, it should be considered creating a new "sub" use case, then referring to that "subroutine" in this scenario.

Step No: Sequential number identifying the step.

步驟編號應語法地定義如下：簡單之步驟編號由數字及選項字母組成。若要求，亦能藉由以點序連簡單步驟編號延伸簡單步驟編號(例：表示步驟之階層)。編號能藉由 POSIX 遵循正規表示式而正式定義： $[0-9]+[a-z]*(\.[0-9]+[a-z]*)^*$ 。此意指步驟編號以任何自然數(包括 0)開頭，後面跟隨著 0 或多個字元。若適用，0 或多個步驟編號能於各步驟編號前面加 1 個點。

Step numbers shall be syntactically defined as follows: A simple step number consists of a digit and an optional letter. If required, simple step numbers can also be extended (e.g. to express a hierarchy of steps) by concatenating simple step numbers with a dot. The numbering can be formally defined by the POSIX-compliant regular expression:  $[0-9]+[a-z]*(\.[0-9]+[a-z]*)^*$ . This means that step numbers start with any natural number (incl. 0), followed by zero or more characters. If applicable, zero or more of these step numbers can follow with a dot in front of each step number.

步驟編號之次序係依前導整數(能由多個數字組成)的自然次序所定義。若 2 個整數相等，則步驟編號係依尾隨字母以字母序排序。經延伸、以點分隔之步驟編號自左至右相應地排序。

The order of step numbers is defined according to the natural order of the leading integer (which can consist of multiple digits). If two integers are equal, the step numbers are ordered according to trailing letters in alphabetical order. Extended, dot-separated step numbers are ordered accordingly from left to right.

例：步驟之列舉及次序基本上依循與文件之共同章節編號相同的規則；1a、1b、1cf、1cg、

1n、1n.2a、1n.2b、2、2a、...、12、...等

事件：觸發步驟的事件。此可能是上一步驟的完成。

例：人類請求功能、定期報告資料或電力系統事件

EXAMPLE The enumeration and order of steps basically follows the same rule as common chapter and section numbering of a document; 1a, 1b, 1cf, 1cg, 1n, 1n.2a, 1n.2b, 2, 2a, ..., 12, ..., etc.

Event: The event that triggers the step. This might be completion of the previous step.

EXAMPLE A human requesting the function, data being reported periodically, or a power system event

過程/活動之名稱：將出現於過程圖中的標籤。當命名活動時宜使用動作動詞。

例：“電網中發生故障”（參照附錄 B 中之 FLISR 示例）。

過程/活動之說明：此描述此步驟中發生的動作。焦點宜少在應用之演算法上，而更多地在此行為者間的互動及資訊流上。

Name of process/activity: Label that would appear in a process diagram. Action verbs should be used when naming activity.

EXAMPLE “Fault occurs in the grid” (Refer to FLISR example in Annex B).

Description of process/activity: This describes what action takes place in this step. The focus should be less on the algorithms of the applications and more on the interactions and information flows between actors.

服務：此欄位識別資訊流之本質及資訊的發起者。可用選項為源自 IEC 61968-ID0:2013, 6.2.2 之 CREATE、GET、CHANGE、DELETE、CANCEL、EXECUTE。此外，亦建議使用 REPORT、TIMER 及 REPEAT。

Service: This column identifies the nature of the information flow and the originator of the information. Available options are CREATE, GET, CHANGE, DELETE, CANCEL, EXECUTE derived from IEC 61968-ID0:2013, 6.2.2. Additionally, REPORT, TIMER and REPEAT are suggested.

CREATE 意指將於生產者處建立資訊物件。

GET (若無填充，則此為預設值)意指接收者對生產者請求資訊(預設)。

CHANGE 意指資訊待更新。生產者更新接收者之資訊。

CREATE means that an information object is to be created at the Producer.

GET (this is the default value if none is populated) means that the Receiver requests information from the Producer (default).

CHANGE means that information is to be updated. Producer updates the Receiver's information.

DELETE 意指待刪除之資訊。生產者刪除源自接收者之資訊。

CANCEL、CLOSE 隱示與過程相關之運作，諸如工作單的關閉或控制請求的取消。

EXECUTE 係當使用服務傳遞複雜交易時使用，其可能包含多個動詞。

REPORT 係用以表示自發資訊或非同步資訊流之傳送。生產者對接收者提供資訊。

DELETE means that information is to be deleted. Producer deletes information from the Receiver.

CANCEL, CLOSE imply actions related to processes, such as the closure of a work order or the cancellation of a control request.

EXECUTE is used when a complex transaction is being conveyed using a service, which potentially contains more than one verb.

REPORT is used to represent transferral of unsolicited information or asynchronous information flows. Producer provides information to the Receiver.

TIMER 係用於表示等待期間。當使用 TIMER 服務時，資訊生產者及資訊接收者欄位應指相同行為者。

REPEAT 係用於指示重複一系列步驟，直至出現條件或觸發事件。條件係規定為此列或步驟之“事件”欄中的文字。

TIMER is used to represent a waiting period. When using the TIMER service, the Information Producer and Information Receiver fields shall refer to the same actor.

REPEAT is used to indicate that a series of steps is repeated until a condition or trigger event. The condition is specified as the text in the “Event” column for this row or step.

於字詞 REPEAT 之後，應於括號中出現待重複的系列之第 1 個及最後步驟編號，格式為 REPEAT(X-Y)，其中 X 為第 1 個步驟，Y 為最後步驟。

此等共同服務定義係與自動化/資訊或通訊系統相關。若使用案例模板係適用於其他領域，則可能使用並描述更多服務。

Following the word REPEAT, shall appear, in parenthesis, the first and last step numbers of the series to be repeated in the following form REPEAT(X-Y) where X is the first step and Y is the last step.

These common service definitions are related to automation/information or communication systems. In case the use case template is applied in other domains, further services might be used and described.

資訊生產者：識別資訊之生產者或來源。此宜為參考模板節次的行為者之一。

訊息接收者：識別訊息之接收者。此亦宜為上文所識別的行為者之一。

所交換資訊 ID：此簡要描述資訊生產者與資訊接收者的 2 個行為者間待交換之資訊：

- 源自本使用案例中未描述之某些外部來源的使用案例輸入。

- 使用案例內部(例：使用案例內之不同應用與系統間)。

Information producer: This identifies the producer or source of the information. This should be one of the actors in the reference template section.

Information receiver: This identifies the receiver of the information. This should also be one of the actors identified above.

Information exchanged IDs: This describes briefly the information to be exchanged between the two actors information producer and information receiver:

- Input to the use case from some external sources that is not described in this use case.
- Internal to the use case (e.g. between different applications and systems within the use case).

- 使用案例之輸出將由未包含於此使用案例中的其他行為者/個體所使用。
- 此欄不宜包含技術議題/要求事項。
- 容許於 1 個步驟中列出多個資訊，以逗號分隔。
- 基於相關使用案例集彙總 2 個行為者間所交換之資訊，能特性化所需的通訊/訊息酬載。

載。

- Output from the use case that will be used by other actors/entities not included in this use case.
- This column should not contain technology issues/requirements.
- It is allowed to list several information in one step, comma separated.
- Summarizing the information exchanged between two actors based on the relevant set of use cases can characterize the needed communication/message payload.

- 詳細之資訊交換宜使用 ID ( "資訊名稱" ) 識別。若未參引預設名稱空間，則此種名稱宜包括來源名稱空間。於此情況下，該欄僅包含所交換資訊之 ID，其鏈接至有關下列模板節次 5 中分離的表中之資訊的更詳細資訊，其係用於使用案例的所有步驟。

- Detailed information exchange should be identified using an ID ("Name of Information"). Such name should include the source namespace, if not referring to the by-default one. In this case, the column only contains the ID of the exchanged information which link to more details about the information in a separate table in the following template section 5 which is used for all steps of the use case.

此處之資訊可以使用簡短 ID，詳細資訊參引模板節次 5。能列出多個所交換資訊 ID，以逗號分隔。

Here the information can use a short ID referring to template section 5 for further details. Several information exchanged IDs can be listed, comma separated.

要求 ID：宜於分離之文件中針對所有使用案例定義詳細要求事項，並參考下列各項：

- 容許於 1 個步驟中列出多個要求，以逗號分隔。
- 有關進一步細節，參照模板節次 7 “要求事項清單的定義”。

於該等步驟中，詳細要求事項係使用 ID (R-ID)鏈接至要求事項之一般清單，以及於模板節次 6 中此使用案例及其步驟的要求事項彙總。

Requirement IDs: Detailed requirements should be defined in a separate document for all use cases with the following references:

- It is allowed to list several requirement in one step, comma separated.
- Refer to template Clause 7 “Definition of a list for requirements” for further details.

In the steps, the detailed requirements are linked to the general list of requirements using IDs (R-ID) as well as to the summary of requirements of this use case and its steps in template section 6.

Scenario 情境								
情境名稱 Scenario name		編號...至... No. ... - ...						
步驟 編號 Step No.	事件 event	過程/活動 之名稱 Name of process/ activity	過程/活動 之說明 Description of process/ activity	服務 service	資訊產生 者(行為 者) Informa- tion producer (actor)	資訊接收 者(行為者) Informa- tion receiver (actor)	所交換之 資訊(ID) Informa- tion exchanged (IDs)	要求、R- ID Require- ment, R- IDs

應提供任何替代方案、錯誤管理及/或維護/備份序列。

若需進一步場景，能新增更多表格(藉由複製及黏貼用於文字處理程式模板)。

#### 模板節次：5 所交換之資訊

Any alternative, error management and/or maintenance/backup sequences shall be provided.

If further scenarios are needed, further tables can be added (for the word processing program template by copy & paste).

#### Template section: 5 Information exchanged

所交換之資訊
--------

Information exchanged			
所交換資訊 ID	資訊之名稱	所交換資訊之說明	要求、R-ID
Information exchanged ID	Name of information	Description of information exchanged	Requirement, R-IDs

此等資訊物件係對應於模板節次 4 “逐步分析” 場景步驟中所參引之 “資訊交換” 欄的 “資訊名稱”。若合適，能新增對資訊物件之進一步要求事項。

所交換資訊 ID；係唯一之 ID，用以識別使用案例全景中所選擇的資訊。

資訊之名稱：係唯一之 ID，用以識別使用案例全景中所選擇的資訊。

These information objects are corresponding to the “Name of Information” of the “Information Exchanged” column referenced in the scenario steps in template section 4 “Step by Step Analysis”. If appropriate, further requirements to the information objects can be added.

Information exchanged ID; is a unique ID which identifies the selected information in the context of the use case.

The name of information: is a unique ID which identifies the selected information in the context of the use case.

當深入分析及工程設計時，將使用案例對應至標準，並考量針對相同使用案例能考量多個名稱空間，然後建議提及與所選擇資訊相關聯之名稱空間，並附加至到此 ID（例：“namespace\_name.information ID”）。有可能能於參引中之使用案例文件的開頭引入“預設名稱空間”。於此情況下，“資訊名稱”未明確地參引名稱空間，預設參引所參引文件清單中所指示之“預設名稱空間”。

When going deeper in analysis and engineering, mapping the use case to standards, and considering that multiple namespaces can be considered for the same use case, then it is recommended that the namespace associated to the selected piece of information is mentioned and attached to this ID (such as “namespace\_name.information ID”). Possibly a “By-default namespace” can be introduced at the beginning of the use case document within the references. In that case, “Name of Information” which not explicitly refers to a namespace, referring by default to the “By-default namespace” indicated in the referenced documents list.

例：基於由 SDO (標準開發組織) 所定義之語意資訊模型的名稱空間，如 CNS 61970-301、CNS 61968-11 (共同資訊模型 CIM)、IEC 62325-301，以及 CNS 61850 系列標準中之

相關資訊模型(例：邏輯節點)，或 CNS 62056 系列標準(COSEM 電能計量配套規格)。

EXAMPLE Namespaces based on semantic information models defined by SDOs (Standards Developing Organisation) like IEC 61970-301, IEC 61968-11 (Common Information Model CIM), IEC 62325-301, and related information models from IEC 61850 (e.g. logical nodes), or IEC 62056 (COSEM Companion Specification for Energy Metering).

使用使用案例儲存庫，已匯入之任何資訊類別可供其他使用案例使用，無須於所有使用案例中定義。

所交換資訊之說明：簡要說明，若宜新增對既存資料模型/資訊類別之參引。建議使用既存之正準資料模型。

Using a use case repository, any information classes that have been imported are available to other use cases and do not have to be defined in all use cases.

Description of information exchanged: Brief description, in case a reference to existing data models/information classes should be added. Using existing canonical data models is recommended.

要求 ID：能用以定義參引資訊之要求事項，而非如逐步分析般參考步驟(參照下文模板節次 6)。

例：對應於此資訊物件之資料保護類別。

Requirement IDs: can be used to define requirements referring to the information and not to the step as in the step by step analysis (see template section 6 below).

EXAMPLE Data protection class corresponding to this information object.

#### 模板節次：6 個要求事項(選項)

此表格彙總使用案例中所有步驟之要求事項，並鏈接至模板節次 4 “逐步分析”。用於要求事項之 ID (R-ID)係唯一的 ID，用以識別所有使用案例中之要求(例：於儲存庫中)。

#### Template section: 6 Requirements (optional)

This table summarizes the requirements of all steps in the use case and it is linked to template section 4 “Step by Step Analysis”. The ID for requirements (R-ID) is a unique ID which identifies the Requirement in all use cases (e.g. in a repository).

該表格係屬選項，因建議於分離之文件中收集所有使用案例(例：於區域內)的要求事項。

於使用案例模板中，此表格可用以提供完整之概觀(例：於使用使用案例儲存庫時自動填寫)，或於使用案例說明的開始階段(例：由領域專家填寫，稍後由 IT/自動化專家更詳細地

定義)。

The table is optional, because it is recommended to collect the requirements of all use cases (e.g. within an area) in a separate document. Within a use case template, this table can be used to provide a complete overview (e.g. filled automatically when using a use case repository) or within the starting phase of the use case description (e.g. by the domain experts, later to be specified in more detail by IT/automation experts).

要求事項(選項)		
Requirements (optional)		
種類 ID Category ID	要求事項之種類名稱 Category name for requirements	種類說明 Category description
要求、R-ID Requirement, R-ID	要求名稱 Description name	要求說明 Description description

種類 ID：針對種類之唯一識別符。依第 7 節，要求事項係以種類排序。針對複雜種類，種類名稱能為“點分隔”：[種類之 ID].[子種類的 ID].[其他子種類...]。

Category ID: Unique identifier for the category. According to Clause 7, requirements are sorted in categories. For complex categories, the category name can be “dot-delimited”: [ID of category].[ID of Sub Category].[other Sub category...].

要求事項之種類名稱：用於要求事項之種類之名稱。

種類說明：要求種類之說明。

要求 ID：唯一識別符，其識別其種類內之要求，且其能將要求鏈接至外部要求文件。

Category name for Requirements: A name for the category of requirements.

Category Description: Description of the requirement category.

Requirement ID: Unique identifier which identifies the requirement within its category and which can link the requirement to an external requirement document.

要求名稱：要求之名稱。

要求說明：要求之說明(若要求前已於外部文件中描述，則此可由儲存庫自動填充，以便於此處自動填充)。

Requirement name: A name of the requirement.



Requirement Description: Description of the requirement (this might be populated automatically by a repository, if the requirement has already been described in the external document before, so that it can be filled in here automatically).

該表格將依所識別種類之數量複製。

有關進一步細節，參照第 7 節“要求事項清單之定義”。

#### 模板節次：7 共同用語及定義

The table will be copied according to the number of categories identified.

For further details refer to Clause 7 "Definition of a list for requirements".

#### Template section: 7 Common terms and definitions

共同用語及定義 Common terms and definitions	
用語 Term	定義 Definition

針對所有使用案例，用語及其定義宜於之共同詞彙中定義。此處列出屬於此使用案例之相關用語。針對詞彙使用資料庫儲存庫，可基於既存資訊自動填入定義。

#### 模板節次：8 客製化資訊(選項)

Terms and their definitions Should be defined in a common glossary for all use cases. Here relevant terms belonging to this use case are listed. Using a database repository for the glossary, the definitions might be filled automatically based on existing information.

#### Template section: 8 Custom information (optional)

客製化資訊(選項) Custom information (optional)		
關鍵詞 Key	值 Value	參引節次 Refers to section

自訂資訊節次提供彈性選項，以包含不適合模板其他部分之各種自訂、半結構化資訊。為包括自訂資訊，應於個別欄中提供(唯一)關鍵詞，其識別自訂資訊及值欄中之對應值。關鍵詞應限定資訊之型式，並應以點記法標記(若使用子概念)。若應定義多個值，則此等值

應以逗號分隔。若自訂資訊與此模板中之其他部分相關，則能於最後欄中規定。

The custom information section provides a flexible option to include miscellaneous custom, semi-structured information which does not fit into other parts of the template. To include custom information a (unique) key shall be provided in the respective column that identifies the custom information and a corresponding value in the value column. Keys shall qualify the type of information and shall be noted in a dot notation, if for instance sub-concepts are being used. In case multiple values shall be defined, these shall be separated by commas. If the custom information is related to another section in this template, this can be specified in the last column.

**關鍵詞**：使用案例範圍內之唯一關鍵詞，用於識別目的。

例：SGAM.zones、author.jobtitle、ConsideredSystem。

值：針對所提供之關鍵詞，提供對應的資訊。

例：站所、現場或現場工程師或智慧表計。

**參引節次**：此欄位參引本標準中之相關模板節次(選項)。

**Key**: Use case wide unique key for identification purposes.

EXAMPLE SGAM.zones, author.jobtitle, ConsideredSystem.

**Value**: Provides the corresponding information for the provided key.

EXAMPLE Station, Field, or Field engineer, or Smart Meter.

**Refers to section**: This field refers to relevant template section in this document (optional).

例 1.1：

節次 8 係屬選項，且僅應納入使用案例模板，若該資訊確實無法入他處 - 參照附錄 B，其提供如何將各種資訊納入模板之示例。

針對 IEC 內部使用之新欄位應通知負責的委員會，並應於使用前依本系列標準中所定義的程序確認。

EXAMPLE 1.1.

This section 8 is optional and shall only be included in a use case template, if the information really cannot be included elsewhere - please refer to Annex B which gives an example on how various information can be included in the template.

New fields for the use inside the IEC shall be notified to the responsible committee and shall be acknowledged according to procedure defined in IEC 62559 prior to use.

## 6. 行為者清單之定義

### 6 Definition of an actor list

“行為者”之概念極為一般，且能涵蓋：

使用案例涉及或受使用案例影響之人員(其角色或工作)、系統、資料庫、組織及裝置：

例：運作者、系統管理者、技術員、終端使用者、服務人員、管理人員、SCADA 系統、即時資料庫、地區輸電營運者(regional transmission operator, RTO)、遠端終端單元(remote terminal unit, RTU)、智慧電子裝置(intelligent electronic device, IED)，甚至電力系統。

The concept of an “actor” is very general and can cover:

People (their roles or jobs), systems, databases, organizations, and devices involved in or affected by the use case: e.g. operators, system administrators, technicians, end users, service personnel, executives, SCADA system, real-time database, regional transmission operator (RTO), remote terminal units (RTU), intelligent electronic devices (IED) and even the power system.

大致行為者可能區分為系統行為者及營運行為者：

- 系統行為者涵蓋功能或裝置。例：於能源系統區域中，系統行為者係定義於介面參考模型(CNS 61968 系列標準)中。
- 營運行為者實際上規定“角色”；能由不同個體取得之角色。

Roughly actors might be divided into system actors and business actors.

- System actors are covering functions or devices. For example in the energy system area, system actors are defined in the interface reference model (IEC 61968).
- A business actor specifies in fact a “role”; roles can be taken by diverse entities.

例：針對能源系統中行為者/角色之典型示例。

- “表計營運者(meter operator)”角色能由特定公司或配電系統營運者(DSO)公司取得。
- “聚合者”係能由 DSO 公司、能源服務公司(ESCO)或能源供應者等許多個體擔取得之角色。

EXAMPLE Typical examples for actors/roles in the energy system.

- “Meter operator” a role that can be taken either by a specific company or by a distribution system operator (DSO) company, or
- “Aggregator” is a role that could be taken by many entities like a DSO company, an energy service company (ESCO) or an energy supplier.

當使用案例於工程期間越加詳細，行為者亦可能越加精確地定義。例：於標準化中，通用行為者及角色，以及於特定專案中所使用之真實裝置或個體。

針對某些使用案例，若通用行為者能由不同角色(例：不同國家之不同市場利害相關者)所實現，則此行為者的邏輯定義可能有用。因此，於行為者清單中，“滿足角色之可能行為者”欄位可用以提供可能對映至更特定行為者的示例。

As use cases are more and more detailed during the engineering, also actors might be defined more and more precisely. For example, in standardization generic actors and roles and in specific projects real devices or entities are used.

For some use cases, the logical definition of a generic actor might be useful, if this actor can be realized by different roles (e.g. different market stakeholders in different countries). In the actor list therefore the column “Possible actors fulfilling a role” might be used to provide examples for a possible mapping to a more specific actor.

行為者係定義於分離之清單中，其服務於所有使用案例。若關注之區域中存在通用行為者清單，則於使用案例中宜盡可能僅使用該通用行為者清單中的行為者。

IEC 使用案例儲存庫(UCR)中提供特定領域之通用行為者清單。當建議新行為者時，應依本標準第 1 部分中所描述之程序，對其描述並新增至 IEC 的通用行為者清單中。

Actors are defined in a separate list which serves for all use cases. If a generic actor list exists in the area of interest, only actors of this generic actor list should be used as far as possible in the use case.

A generic actor list for specific areas is provided in the IEC use case repository (UCR). When suggesting new actors, they shall be described and added to the generic actor list of IEC according to the procedure described in Part 1 of this standard.

行為者清單針對行為者包含下列資訊：

- 區域。

例：智慧電網/能源系統。

- 對映至分群。

例：對“能源系統”區域內“智慧計量”之要求事項排序。

The actor list contains the following information for each actor:

- Area.

EXAMPLE Smart Grid/energy systems.

- Mapping to grouping.

EXAMPLE To sort requirements for "smart metering" within the area "energy system"

- 行為者之名稱。

例：配電系統營運者(DSO)。

- 行為者名稱之縮寫。

例：DSO。

- Name of the actor.

EXAMPLE Distribution system operator (DSO)

- Abbreviation for the actor name.

EXAMPLE DSO.

- 行為者型式(例：角色、應用...).

例：DSO 係屬角色，能源管理系統(EMS)係屬應用。

- 行為者之定義。

此處應描述行為者。通常，行為者係自既存的行為者清單中所取得，因此定義已存在。

- Actor type (e.g. roles, application, ...).

EXAMPLE DSO is a role, an energy management system (EMS) is an application.

- Definition of actor.

Here the actor shall be described. Usually the actor is taken from an existing actor list so that the definition already exists.

- 滿足此角色之可能行為者。

例：針對行為者“表計營運者”，其可能為 DSO 或獨立表計營運者，取決於國家背景或特定專案。

- 國際、地區或國家相關性。

取決於地區或國家立法或市場之不同，行為者的定義可能有所不同。

- Possible actors fulfilling this role.

EXAMPLE For the actor “meter operator” it might be a DSO or an independent meter operator, depending on the national background or the specific project.

- International, regional or national relevance.

Actors might differentiate in definition depending on regional or national legislation or markets.

- 定義之來源。

行為者宜盡可能基於相關區域或領域之既存資料模型。

例：資料模型，如計量領域中之 CIM 共同資訊模型(CNS 61968/61970 系列標準)或

COSEM (CNS 62056 系列標準)。

- Source of the definition

Actors should be based as far as possible on existing data models in the relevant area or domain.

EXAMPLE Data models like CIM common information model (IEC 61968/61970) or COSEM in the metering domain (IEC 62056).

- 親項。

此欄係用以建立一種行為者之階層。

例：電網營運者作為輸電或配電系統營運者(TSO 或 DSO)之親項。

- 進一步備註。

此清單能用以依不同需要排序資訊(例：過濾特定分群之行為者)。

- Parent

This column is used to build up a kind of hierarchy of actors.

EXAMPLE A grid operator as parent of transmission or distribution system operator (TSO or DSO)

- Further comments

The list can be used to sort the information according to different needs (e.g. filter for actors of a specific grouping).

## 7. 針對要求事項之清單的定義

### 7 Definition of a list for requirements

用於逐步分析中之要求事項(參照模板節次 4)或所交換的資訊(模板節次 5)，係於分離之文件中定義，其充當所有針對使用案例的參引。於使用案例模板中，要求事項應藉由唯一之要求識別碼(R-ID)鏈接至全域要求事項清單。

本標準之使用者宜先尋求重複使用全域要求事項清單中之既存要求事項。新要求事項宜首先作為全域要求事項清單之延伸提出，以便藉由一致且唯一的識別碼參引。

The requirements used in the step by step analysis (refer to section 4 of the template) or to the information exchanged (section 5 of the template) are defined in a separate document which serves as reference for all use cases. In the use case template, requirements shall be linked to the global requirements list by means of the unique requirement identification number (R-ID). Users of this document should seek first to reuse existing requirements from the global requirements list. New requirements should be presented first as an extension to the global requirements list in order to refer to them by a consistent and unique identifier.

清單中之各要求包含下列資訊：

- 要求名稱。
  - 要求名稱宜為描述要求之簡短字串。其宜可能自其名稱及其種類理解要求。
- 要求識別(R-ID)。
  - R-ID 於全域要求事項清單中應唯一。

Each requirement in the list contains the following information:

- Requirement name.
  - The requirement name should be a short string that is descriptive of the requirement. It should be possible to understand the requirement from its name and its category
- Requirement identification (R-ID).
  - The R-ID shall be unique within the context of the global requirements list
- 基於全域要求事項種類清單之要求種類。
  - 基於種類之數量及詳細程度，種類可能組織於種類樹中。
  - 全域要求事項清單係由種類所組織。若要求，能新增更多要求種類。下列清單顯示頂端層級要求事項種類，此處主要基於 SGAM 及 GWAC。此等種類係視為足夠通用，以轉換至智慧電網外之其他區域。
- Requirement category based on the global requirements category list.
  - Depending on the amount of categories and the level of detail, the categories might be organized in a category tree.
  - The global requirements list is organized by categories. Further requirement categories can be added, if needed. The list below shows the top level requirements categories, here mainly based on SGAM, and GWAC. The categories are perceived as generic enough to be transferred to other areas than the Smart Grid as well.
- 定義。
  - 要求之描述。
- 分群。
  - 表示使用要求事項處之應用區域的一系列字串。

此等係旨在支援於要求事項集合上之關鍵詞搜尋。例：“智慧計量”分群之過濾要求事項。

要求事項清單能用以依不同需要排序資訊進行（例：針對要求種別或特定分群之篩

選)。

- Definition.

- A description of the requirement.

- Grouping

- A series of strings representing application areas where the requirement is used

These are intended to support key word searches on the requirements set. For example, filter requirements for the grouping "Smart Metering".

The requirements list can be used to sort the information according to different needs (e. g. filter for requirement category or a specific grouping).

當設計詳細使用案例時，建議採用下列各項：

要求事項宜設計為「基元」。本節定義之要求：

- 須表示單一性質以便亦用於其他使用案例。

- 此要求不宜參引任何其他要求。例：「用戶裝置應具唯一 ID」同時指特定使用案例內之「用戶裝置」及「唯一 ID」。因此，其係由 2 個基元組成，且須進一步簡化為作為行為者之「用戶裝置」及作為一般要求的「裝置具唯一 ID」。

When designing a detailed use case, the following is recommended

Requirements should be designed to be "atomic". A requirement defined under this clause:

- must express a single property in order to be used also for other use cases.

- The requirement should not refer to any other requirement. For example to say "a customer device shall have a unique ID" refers to both a "customer device" and a "unique ID" within a specific use case. Therefore this is made up of two primitives and must be reduced further to "customer device" as actor and "device has unique ID" as general requirement.

- 僅能為 true 或 false。

- 能藉由分析、檢驗、展示或測試查證要求。該要求不宜為量測或度數。此使得其具基元性及可測試性。

- can only be true or false.

- The requirement can be verified either by analysis, inspection, demonstration, or test. The requirement should not be a measurement or degree. This makes it atomic and testable.

- 能完全自其名稱及其於種類樹中之位置理解。

- 亦即，由其所附加至之分支及其文字所定義。例：若種類為「6.8 服務之品質」（參照下文），且要求係「頻寬利用率：<10%」，則要求服務品質的頻寬利用率低於 10%。



- can be understood entirely from its name and its position in the category tree.
  - That is, the branch it is attached to and its text defines it. For example, if the category is “6.8 Quality of Service” (see below), and the requirement is “bandwidth utilization: <10 %” we are requiring the quality of service be for a less than 10 % utilization of bandwidth.
- 須獨立於其來源之來源文件。
  - 例：“XYZ 相容裝置須具符合性驗證”需自聲明中剝除“XYZ”以使其為基元。例：  
“裝置須具符合性驗證”。
- must be independent of the source document from which it came.
  - For example “XYZ-compatible devices must have conformance certification” needs to strip the “XYZ” from the statement to make it primitive. E.g. “devices must have conformance certification”.
- 針對可能(特定於專案)之實現的蘊含，可提及下列各項：
  - 要求之優先序。
  - 實作之難度。
- The following might be mentioned for possible (project specific) implication of realization:
  - Priority of requirement, and
  - Difficulty of implementation

#### 建議之種類清單(種類樹)

##### 1. 營運層級

###### 1.1 監理政策

###### 1.2 營運目標

#### Suggested list of categories (category tree)

##### 1 Business layer

###### 1.1 Regulatory policy

###### 1.2 Business objectives

##### 2. 功能層級

###### 2.1 營運程序

##### 3. 資訊層級

###### 3.1 營運全景

3.2 語意理解

2 Function layer

2.1 Business procedures

3 Information layer

3.1 Business context

3.2 Semantic understanding

4. 通訊層

4.1 語法互運性

4.2 網路互運性

5. 組件層級

5.1 基本連接性

4 Communication layer

4.1 Syntactic interoperability

4.2 Network interoperability

5 Component layer

5.1 Basic connectivity

6. 橫切議題

6.1 內容之共享意義

6.2 資源識別

6.3 時間同步及循序

6.4 存錄及稽核

6 Cross cutting issues

6.1 Shared meaning of content

6.2 Resource identification

6.3 Time synchronisation and sequencing

6.4 Logging and auditing

6.5 交易及狀態管理

6.6 系統保存

6.7 服務之品質

例：可用性、不同組件之可接受停機時間、復原、備份、資料交換的頻率、未來變更之彈

性、回應時間、偵測與其顯示或動作間的資料延時。

#### 6.5 Transaction and state management

#### 6.6 System preservation

#### 6.7 Quality of service

EXAMPLE Availability, acceptable downtime of different components, recovery, backup, frequency of data exchanges, flexibility for future changes, response times, latency of data between detection and its display or action.

#### 6.8 探索及組態

例：位置、距離、通訊布局、媒體、網路頻寬、既存協定、裝置之數量、系統、資料項之數量、預期成長等

#### 6.9 系統演進及縮放性

#### 6.8 Discovery and configuration

EXAMPLE Location, distances, communication layout, media, network bandwidth, existing protocols, number of devices, systems, volume of data items, expected grow, etc

#### 6.9 System evolution and scalability

### 7. 實作

#### 7.1 資訊系統及通訊保護

例：使用者之鑑別、機密性、完整性、防止阻絕服務、不可否認性或可歸責性、錯誤管理。

#### 7 Implementation

#### 7.1 Information system and communication protection

EXAMPLE Authentication of user, confidentiality, integrity, prevention of denial of service, non-repudiation or accountability, error management

#### 7.2 資料管理

例：資料來源之型式、資料的正確性或有效性、資料之及時性或時間加戳、資料量、跨系統資料的同步或一致性、及時存取資料、跨組織邊界之資料驗核、交易管理、資料命名、識別、跨不同系統的格式、資料及資料庫之維護。

#### 7.2 Data management

EXAMPLE Type of source of data, correctness or validity of data, timeliness or time stamping of data, volume of data, synchronization or consistency of data across systems, timely access to data, validation of data across organizational boundaries, transaction management, data naming, identification, formats across disparate systems, maintenance of data and databases.

7.3 功能效能要求

7.4 安全及風險評鑑

例：人身設備安全考量事項及風險評鑑：分析功能/使用案例可能識別特定功能性風險。

7.5 連接及 HMI (人機介面)

7.3 Functional performance requirements

7.4 Safety and risk assessment

EXAMPLE Safety considerations and risk assessment: Analysing the function/use case specific functional risks might be identified.

7.5 Connections and HMI (human machine interface)

## 附錄 A

(參考)

## 行為者之示例

Annex A

(informative)

Examples of actors

備考：

- 此清單(參照表 A.1)並非排他性且未行維護。示例係取自“能源系統/智慧電網”區域。
- 此清單僅包含行為者之示例。

## NOTE

- This list (see Table A.1) is not exclusive and not maintained. Examples are taken from the area “Energy System/Smart Grid”.
- This list contains only examples of actors.

表 A.1 行為者清單之示例

Table A.1 - Example of an actor list

區域	分群	行為者名稱	行為者 縮寫	行為者型式	行為者說明	滿足角色、示 例之行為者	國際或國家關 係	來源	親項	進一步備 註
Area	Grouping	Name of actor	Abbr. of actor	Actor type	Actor description	Actors fulfilling a role, examples	International or national relevance	Source	Parent	Further comments

能 源 / 系 統  /SG Energy/ System /SC	耗用者  Consumer	耗用者  Consumer		角色  Role	電力、瓦斯、自來水或熱能之 終端使用者  End user of electricity, gas, water or heat.  備考：由於耗用者亦能使用分 散式能源產生能源，因此有時 稱為“產消者”。  Note As the sonsumer can also generate energe using a distribued energe resource, he is sometimes call the “prosumer”.		國際  International	與 SMCG 相 關 之  ENTSOE 角色模型  ENTSOE role model related by SMCG		
能 源 / 系 統  /SG Energy/ System /SC	耗用者  Consumer	耗用者能源 管理系統  Customer energy management system	CEMS	系統  System	能源用戶依供應契約或其他 經濟標的，最佳化能源利用之 能源管理系統。負責蒐集用戶 場所內之彈性並將其提供予 聚合者，因此未直接參與彈性 市場。  Energy management system for			SG-CG		

					energy customer to optimize the utilization of energy according to supply contracts or other economical target. Is responsible for gathering flexibilities within the customer premisses and providing them to an aggregator, and therefore does not directly participate in flexibility markets.					
能 源 / 系 統 /SG Energy/ System /SC	電網運作 Grid operation	配電管理系 統 Distribution management system	DMS	系統 System	提供應用以自集中位置(通常為控制中心)監視並控制配電網之系統。DMS 通常具對其他系統(如 GIS 或 OMS)之介面。  A system which provides applications to monitor and control a distribution grid from a centralized location, typically the control center. A DMS typically has interfaces to other systems, like an GIS or an OMS.		國際 International	SG3		

能 源 / 系 統 /SG Energy/ System /SC	電網運作 Grid operation	配電系統營 運者 Distribution system operator	DOS	角色 Role	系統營運者運作配電系統。 System operator operating the distribution system.		國際 International			
能 源 / 系 統 /SG Energy/ System /SC	計量 Metering	表計營運者 Meter operator	MO	角色 Role	負責安裝、維護、測試、驗證 及退役實體表計之一方。 A party responsible for installing, maintaining, testing, certifying and decommissioning physical meters.	充當 MO 之 DSO (國家 特定)。 DSO acting as MO (country specific)	國際 International	ENTSOE 角色模型 ENTSOE role model		
能 源 / 系 統 /SG Energy/ System /SC	電網運作 Grid operation	系統運作者 System operator	SO	角色 Role	負責透過地理區域內之輸電 網實現電力系統穩定運作(包 括組織實體平衡)的一方。SO 亦將判定並負責跨境容量及 交換。若必要，其可減少配電 的容量以確保營運穩定性。上		國際 International	ENTSOE 角色模型 ENTSOE role model		



					<p>述輸電係指「於特高壓或高壓網路上對最終用戶或配送者傳送電力。輸電之運作亦包括連接能量流管理、系統可靠性，以及所有必要系統服務可用性之系統運作任務。(定義取自 UCTE 運作手冊用語表)。當地市場規則可能規定額外義務。</p> <p>A party that is responsible for a stable power system operation (including the organization of physical balance) through a transmission grid in a geographical area. The SO will also determine and be responsible for cross border capacity and exchange. If necessary he may reduce allocated capacity to ensure</p>					
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					operational stability. Transmission as mentioned above means “the transport of electricity on the extra high or high voltage network with a view to final customers or to distributors. Operation of transmission includes as well the tasks of system operation connecting its management of energy flows, reliability of the system and availability of all necessary system services.” (definition taken from the UCTE operation handbook glossary). To be considered additional obligations may be imposed through local market rules.					
能 源 / 系 統 /SG Energy/ System	電網運作 Grid operation	網路運作監 視 Netwoak operation monotoring		應用 Application	網路運作監視行為者監測網路拓撲、連接性及負載狀況，包括斷路器及控制設備狀態。其定位用戶電話投訴及現場			基於 IEC 61968-1。 Based IEC 61968-1		

/SC					<p>工班。</p> <p>Network operation monitoring actors supervise network topology, connectivity and loading conditions, including breaker and control equipment status. They locate customer telephone complaints and field crews.</p>					
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## 附錄 B

(參考)

## 基於所建議模板之使用案例示例

(簡短及延伸版本)

Annex B

(informative)

Example of a use case based on the suggested template

(short and extended version)

**B.1 使用案例之簡短版本 “定位並隔離故障且復原系統(FLISR 故障定位、隔離、系統復原)”****B.1 Short version of the use case "Locate and isolate fault and restore system (FLISR Fault location, isolation, system restoration)"**

此示例及下個示例係基於 IEC 技術機構及智慧電網協調小組(參照參考資料)中從事之使用案例。由於該使用案例僅作為示例，其不更新或發布以供任何進一步使用，因此填寫幾個欄位用於展示目的。

This and the next example are based on use case worked on in IEC technical bodies and in the Smart Grid Coordination Group (refer to the bibliography). As the use case is only taken as example it is not updated or released for any further use, several fields are filled for demonstration purpose.

**1. 使用案例說明****1.1 使用案例之名稱***1 Description of the use case**1.1 Name of use case*

使用案例識別		
Use case identification		
ID	區域/領域/分區 Area/Domain(s)/Zone(s)	使用案例之名稱 Name of use case
		定位並隔離故障且復原系統(故障定位、隔離及系統復原(FLISR)) Locate and isolate fault and restore system (Fault location, isolation and system restoration (FLISR))

**1.2 版本管理**

**1.2 Version management**

版本管理 Version				
版本編號 Version No.	日期 Date	作者之名稱 Name of author	變更 Changes	核可狀態 Approval status
	2011-11-24	Rolf Apel		

**1.3 使用案例之適用範圍及目標****1.3 Scope and objectives of use case**

使用案例之適用範圍及目標 Scope and objectives of use case	
適用範圍 Scope	
目標 Objective(s)	
相關之營運案例 Related business case(s)	

**1.4 使用案例之敘事****1.4 Narrative of use case**

使用案例之敘事 Narrative of use case
簡短說明 Short description  FLISR 使用案例分為 4 個序列  1. 故障偵測及淨空 (clearance) - 電網中之保護裝置正偵測故障並發出適當的斷路器跳脫訊號。  2. 故障定位 (fault localization) - 藉由分析接收自電網中保護裝置之遙測警示識別故障的實體位置。  3. 故障隔離 - 判定開關動作，其將自電網之其餘部分隔離故障設備。  4. 系統復原 - 為故障清理期間斷電之電網健康部分重新供電。

此等序列中之執行通常係高度自動化，而下個序列的持續通常要求控制室運作者互動。

The FLISR use case is divided into four sequences

1. Fault detection and clearance - The protection devices in the grid are detecting the fault and issuing suitable breaker tripping.
2. Fault localization - Identify the physical location of the fault by analysing the telemetered alarms received from protection devices in the grid.
3. Fault isolation - Determine switching actions which will isolate the faulty equipment(s) from the rest of the grid.
4. System restoration - Resupply those healthy parts of the grid, which are de-energized during the fault clearing.

The execution within these sequences is typically highly automated, while the continuation with the next sequence typically requires a control room operator interaction.

#### 完整說明

##### *Complete description*

若配電網中發生故障，則保護裝置將偵測出此情況並立即啟動斷路器跳脫以消除故障。由於配電網中故障保護之選擇性較低，通常大部分配電網將斷電，例：完整的饋線。

If a failure happens in the distribution grid, the protection devices will detect this and initiate immediately breaker tripping to de-energize the fault. Due to the lower selectivity of the fault protection in distribution grids, typically a large part of the distribution grid becomes de-energized, e.g. a complete feeder.

借助通訊系統、位於電力系統上之故障通道指示器，以及位於主變電所的通訊斷路器，控制中心之 FLISR 應用將察覺故障、識別故障區段、遠端隔離故障。無論係於運作者之控制下或係於 1 種閉環運作中。所判定用以隔離或復原之開關動作的效應可能自動地模擬並查證，或由配電營運者於執行前模擬並查證。

Together with the help of a communicating system, and fault passage indicators located on the power system, and communicating breakers located at the main substation, the FLISR application in the control center will be aware of a fault, identify the faulty section, remotely isolate the faulty section and remotely restore power to the healthy part, either under the control of the operator or in a kind of closed loop operation. The effects of the determined switching actions for isolation or restoration might be simulated and verified automatically or by the distribution operator prior to execution.

於此類網路中運作之公用事業需快速故障察覺、故障區段識別、快速資訊蒐集，以及切換選項的分析，以於連接之相關饋線的部分用戶丟失時復原服務。無此能力，若市中心變電所發生故障，可能需幾個小時或更長時間才能復原供電。該應用於控制中心層級運行，與

充當感測器或致動器之現場裝置緊密連接。

饋線能為架空式或地下式或兩者。

Utilities that operate in such networks have a need for fast fault awareness, faulty section identification, rapid information gathering, and analysis of switching options to restore service when a part of the consumers, attached to the concerned feeder is lost. Without this capability, it can make several hours or more to restore power should an inner city substation be lost. This application runs at a control centre level, with tight connection with field devices acting either as sensors or actuators.

Feeder can be of overhead or underground types or both.

實作 FLISR 有助於公用事業提高效能式費率(performance based rate, PBR)並降低處罰風險。效能式費率(PBR)之規則將因國家甚至州而異，然而大多數包括 SAIDI (系統平均中斷持續時間指標)、SAIFI (系統平均中斷頻率指數)等效能指標，且通常包括每英里線路的系統平均中斷次數。另一商業作法能量測由於消費者側電力不可用而導致之非分散式能源的數量。故障後復原越快，未配送之電能越少。

Implementing FLISR helps the utility to improve the performance based rates (PBR) and reduce the risk of penalties. The rules for performance based rates (PBR) will vary from country to country, or even from state to state, however most include the performance measures of SAIDI (system average interruption duration index), SAIFI (system average interruption frequency index), and often system average interruptions per mile of line. Another business approach can be to measure the quantity of non-distributed energy due to un-availability of power at consumer side. The quicker is the restoration after a fault, the less is the quantity of non-distributed energy.

## 1.5 關鍵效能指標(KPI)

### 1.5 Key performance indicators (KPI)

關鍵效能指標(KPI)			
Key performance indicators (KPI)			
ID	名稱 Name	說明 Description	對所提及使用案例目標之參引 Reference to mentioned use case objectives

## 1.6 使用案例條件

### 1.6 Use case conditions

使用案例條件 <i>Use case conditions</i>
假設 Assumption

先設條件 Prerequisite

### 1.7 分類/對映使用案例之進一步資訊

#### 1.7 Further information to the use case for classification/mapping

分類資訊 Classification information
對其他使用案例之關係 Relation to other use case
深度之層級 Level of depth
優先序化 Priortisation
通用、地區或國家關係 Generic, regional or national relation
使用案例之本質 Nature of the use case



用以分類之進一步關鍵詞 Futher keywords for classification

### 1.8 一般備註

#### 1.8 General remarks

一般備註 <i>General remarks</i>

### 2 使用案例之圖表

#### 2 Diagrams of use case

使用案例之圖表 <i>Diagram(s) of use case</i>

### 3. 技術細節

#### 3.1 行為者

##### 3 Technical details

##### 3.1 Actors

行為者 Actor	
分群 Grouping	群組說明 Group description

行為者名稱 Actor name	行為者 型式 Actor type	行為者說明 Actor description	特定於此使用案 例之進一步資訊 Further information specific to this use case

開關動作排程/運作 工作排程 Switch action scheduling/operation work scheduling		開關動作排程針對處置與開關次序 公式化相關之所有層面、草擬運作指 導綱要、派遣維修工班，並通知受影 響的用戶提供支援。其輔助收集相關 資料且以所請求之各種形式交付。 Switch action scheduling provides supports for handling all aspects relevant to switch order formulation, drawing up operating guidelines, dispatching repair crews and informing customers affected. It assists in collecting the related data and delivering it in the various forms required.	
網路運作監視 Network operation monitoring		網路運作監視行為者監測控網路拓 撲、連接性及負載狀況，包括斷路器 及開關狀態以及控制設備狀態。其定 位用戶電話投訴及現場工班。 Network operation monitoring actors supervise network topology, connectivity and loading condition, including breaker and switch status, and control equipment status. They locate customer telephone complaints and field crews.	
網路運作模擬 Network operation simulation		此組功能容許模擬設施定義、準備並 最佳化執行系統維護工作(發布/淨空 單)及運作規劃所需之運作序列。 This set of functions allows simulation facilities to define, prepare and optimise the sequence of operations required for carrying out maintenance work on the system (release/clearance orders) and operational planning.	

配電管理系統(DMS) Distribution management system (DMS)		<p>提供應用以自集中位置(通常係控制中心)監視並控制配電網之系統。</p> <p>DMS 通常具對其他系統(如 GIS 或 OMS)之介面。</p> <p>A system which provides applications to monitor and control a distribution grid from a centralized location, typically the control center. A DMS typically has interfaces to other systems, like an GIS or an OMS.</p>	
配電營運者 Distribution operator		<p>運作配電營運者系統之人員。</p> <p>Person operating the distribution operator system.</p>	
網路運作故障管理 Network operations fault management		<p>故障管理行為者增強故障定位、識別及區段化之速度，以便復原服務。其為客戶提供資訊，協調勞動力派遣並編制資訊用以統計。</p> <p>Fault management actors enhance the speed at which faults are located, identified, and sectionalized so service can be restored. They provide information for customers, coordinate with workforce dispatch and compile information for statistics.</p>	IEC 61968-1
致動器 Actuator		<p>致動器係接受訊號並將其轉換為實體動作之感測器。換言之，致動器導致發生與發送予其的資料相關之動作。其係用以遠端地運作諸如開關及斷路器之裝置。</p> <p>An actuator is a transducer that accepts a signal and converts it to a physical action. In other words, an actuator causes an action to occur relating to the</p>	

		data that was sent to it. They are used to remotely operate devices such as switches and circuit-breakers.	
配電量測 Distribution measure		<p>由提供現場電力流及系統狀況可視性之行為者所執行。未來，量測可能內建於電網中之表計、變壓器、饋線、開關及其他裝置中。示例為透過 SCADA 系統自遠端終端單元(RTU) 收集數位及類比量測值，並將其提供予運作領域中之電網控制中心。</p> <p>Performed by actors that provide visibility into the flow of power and the condition of the systems in the field. In the future, measurement might be found in built into meters, transformers, feeders, switches and other devices in the grid. An example would be the digital and analog measurements collected through the SCADA system from a remote terminal unit (RTU) and provided to a grid control center in the operations domain.</p>	
配電保護裝置 Distribution protection device		<p>對系統中可能導致停電、限電或設備損壞之故障，以及其他事件做出快速反應的行為者。旨在維持高水準可靠性及電能品質。示例包括 FACT 裝置、開關、電路中斷器、電容器、電抗器、熔線。</p> <p>Actors that react rapidly to faults and other events in the system which might cause power outages, brownouts, or the destruction of equipment. Performed to maintain high levels of reliability and</p>	

		power quality. Examples include FACTS devices, switches, circuit interrupters, capacitors, reactors, fuses.	
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### 3.2 參引

#### 3.2 References

參引 References						
編號 No.	參引型式 References type	參引 Reference	狀態 Status	使用案例上之影響 Impact on use case	發起者/組織 Originator/ organisation	鏈接 Link

#### B.2 使用案例“定位並隔離故障且復原系統(FLISR 故障定位、隔離、系統復原)”之使用案例

##### 概觀表

#### B.2 Use case overview table of the use case "Locate and isolate fault and restore system (FLISR Fault location, isolation, system restoration)"

使用案例之名稱 Name of use case	簡短說明 Short description	行為者 Actor	一般備註 General remarks
定位並隔離故障 且復原系統(故障 定位、隔離、系統 復原(FLISR))  Locate an isolate fault and restore system (fault location, isolation and system restoration (FLISR))	FLISR 使用案例分為 4 個序列：  1. 故障偵測及淨空 - 電網中之保護 裝置正偵測故障並發出適當的斷路 器跳脫訊號。  The FLISR use case is divided into four sequences:  1. Fault detection and clearance - The protection devices in the grid are detecting the fault and issuing suitable breaker tripping.  2. 故障定位 - 藉由分析接收自電網 中保護裝置之遙測警示識別故障的	開關動作排程/運作  工作排程、網路運作 監視、網路運作模 擬、配電管理系統 (DMS)、配電營運 者、網路運作故障管 理、致動器、配電量 測、配電保護裝置  Switch action scheduling/operation work scheduling,	

	<p>實體位置。</p> <p>3. 故障隔離 - 判定開關動作,其將自電網之其餘部分隔離故障設備。</p> <p>2. Fault localization - Identify the physical location of the fault by analysing the telemetered alarms received from protection devices in the grid.</p> <p>3. Fault isolation - Determine switching actions which will isolate the faulty equipment(s) from the rest of the grid.</p> <p>4.系統復原 - 為故障清理期間斷電之電網健康部分重新供電。</p> <p>此等序列中之執行通常係高度自動化,而下個序列的持續通常要求控制室運作者互動。</p> <p>4. System restoration - Resupply those healthy parts of the grid, which are de-energized during the fault clearing. The execution within these sequences is typically highly automated, while the continuation with the next sequence typically requires a control room operator interaction.</p>	<p>network operation monitoring, network operations simulation, distribution management system (DMS), distribution operator, network operations fault management, actuator, distribution measure, distribution protection device</p>	
下個使用案例 Next use case			
下個使用案例 Next use case			

### B.3 使用案例“定位並隔離故障且復原系統(FLISR 故障定位、隔離、系統復原)”之詳細版本

#### B.3 Detailed version of the use case "Locate and isolate fault and restore system (FLISR Fault location, isolation, system restauration)"

##### 1.使用案例之定義

## 1.1 使用案例之名稱

### 1 Description of the use case

#### 1.1 Name of use case

使用案例識別		
Use case identification		
ID	區域/領域/分區 Area/Domain(s)/Zone(s)	使用案例之名稱 Name of use case
0100	區域：能源系統 領域：配電系統 分區：運作、站所、現場 Area: energy system Domain: distribution system Zones: operation, station, field	定位並隔離故障且復原系統(故障定位、隔離、系統復原(FLISR)) Locate and isolate fault and restore system (Fault location, isolation, system restauration (FLISR))

## 1.2 版本管理

### 1.2 Version management

版本管理				
Version management				
版本編號 Version No.	日期 Date	作者之名稱 Name of auyhor(s)	變更 Changes	核可狀態 Approval status
0.9	2011-11-24	Rolf Apel		WD 工作文件 WD working document
1.0	2012-05-15	Rolf Apel	新增繪圖 Drawing added	WD 工作文件 WD working document
1.2	2013-10-08	Rolf Apel	行為者更新、繪圖更新、詳細步驟說明 Actor list updated, drawing updated, step-by-step description detailed	示例文件 Example document

## 1.3 使用案例之適用範圍及目標

## 1.3 Scope and objectives of use case

使用案例之適用範圍及目標 <i>Scope and objectives of use case</i>	
適用範圍 Scope	FLISR 自動化配電網中故障之管理。 FLISR automates the management of faults in the distribution grid.
目標 Objective(s)	<p>為改善效能指標，FLISR 支援故障定位、故障隔離及電能配送復原。於擾動期間，自動化故障處置縮短停電時間，並針對更複雜之情況減輕配電控制中心運作者之負擔。由於 FLISR 正建立重新組態網路之切換提議，因此需考量並實作對應的人身設備安全層面。</p> <p>In order to improve performance indexes, FLISR supports the localization of the fault, the isolation of the fault and the restoration of the energy delivery. During disturbances, the automatic fault handling shortens outage time and offloads the operators in the distribution control center for more complicated situations. As FLISR is creating switching proposals to reconfigure the network, corresponding safety aspects need to be considered and implemented.</p>
相關之營運案例 Related business case	<p>因此，FLISR 可有助於改善如 SAIDI (系統平均中斷持續時間指標)及 SAIFI (系統平均中斷頻率指數)之效能指數。</p> <p>Therefore FLISR may help to improve performance indexes like SAIDI (system average interruption duration index) and SAIFI (system average interruption frequency index).</p>

## 1.4 使用案例之敘事

## 1.4 Narrative of use case

使用案例之敘事 <i>Narrative of use case</i>
簡短說明 Short description
<p>FLISR 使用案例分為 4 個序列：</p> <ol style="list-style-type: none"> <li>故障偵測及淨空 - 電網中之保護裝置正偵測故障並發出適當的斷路器跳脫訊號。</li> <li>故障定位 - 藉由分析接收自電網中保護裝置之遙測警示識別故障的實體位置。</li> </ol>



The FLISR use case is divided into four sequences:

1. Fault detection and clearance - The protection devices in the grid are detecting the fault and issuing suitable breaker tripping.
2. Fault localization - Identify the physical location of the fault by analysing the telemetered alarms received from protection devices in the grid.
3. 故障隔離 - 判定開關動作，其將自電網之其餘部分隔離故障設備。
4. 系統復原 - 為故障清理期間斷電之電網健康部分重新供電。

此等序列中之執行通常係高度自動化，而下個序列的持續通常要求控制室運作者互動。

3. Fault isolation - Determine switching actions which will isolate the faulty equipment(s) from the rest of the grid.

4. System restoration - Resupply those healthy parts of the grid, which are de-energized during the fault clearing.

The execution within these sequences is typically highly automated, while the continuation with the next sequence typically requires a control room operator interaction.

#### 完整說明

#### Complete description

若配電網中發生故障，則保護裝置將偵測出此情況並立即啟動斷路器跳脫以消除故障。由於配電網中故障保護之選擇性較低，通常大部分配電網將斷電，例：完整饋線。

借助通訊系統、位於電力系統上之故障通道指示器，以及位於主變電所的通訊斷路器，控制中心之 FLISR 應用將察覺故障、識別故障區段、遠端隔離故障。無論係於運作者之控制下或係於 1 種閉環運作中。所判定用以隔離或復原之開關動作的效應可能自動地模擬並查證，或由配電營運者於執行前模擬並查證。

If a failure happens in the distribution grid, the protection devices will detect this and initiate immediately breaker tripping to de-energize the fault. Due to the lower selectivity of the fault protection in distribution grids, typically a large part of the distribution grid becomes de-energized, e.g. a complete feeder.

Together with the help of a communicating system, and fault passage indicators located on the power system, and communicating breakers located at the main substation, the FLISR application in the control center will be aware of a fault, identify the faulty section, remotely isolate the faulty section and remotely restore power to the healthy part, either under the control of the operator or in a kind of closed loop operation. The effects of the determined switching actions for isolation or restoration might be simulated and verified automatically or by the distribution operator prior to execution.

於此類網路中運作之公用事業需快速故障察覺、故障區段識別、快速資訊收集，以及切換

選項分析，以便於連接至相關饋線的部分用戶丟失時復原服務。無此能力，若市中心變電所發生故障，可能需幾個小時或更長時間以復原供電。此應用於控制中心層級運行，與充當感測器或致動器之現場裝置緊密連接。

饋線可為架空式或地下式或兩者。

Utilities that operate in such networks have a need for fast fault awareness, faulty section identification, rapid information gathering, and analysis of switching options to restore service when a part of the consumers, attached to the concerned feeder, is lost. Without this capability, it can make several hours or more to restore power should an inner city substation be lost. This application runs at a control centre level, with tight connection with field devices acting either as sensors or actuators.

Feeder can be of overhead or underground types or both.

實作 FLISR 有助於公用事業提高效能式費率(PBR)並降低處罰風險。效能式費率(PBR)之規則將因國家甚至州而異，然而大多數包括 SAIDI (系統平均中斷持續時間指標)、SAIFI (系統平均中斷頻率指數)等效能指標，且通常包括每英里線路的系統平均中斷次數。另一商業作法能量測由於消費者側電力不可用而導致之非分散式能源的數量。故障後復原越快，未配送之電能越少。

Implementing FLISR helps the utility to improve the performance based rates (PBR) and reduce the risk of penalties. The rules for performance based rates (PBR) will vary from country to country, or even from state to state, however most include the performance measures of SAIDI (system average interruption duration index), SAIFI (system average interruption frequency index), and often system average interruptions per mile of line. Another business approach can be to measure the quantity of non-distributed-energy due to un-availability of power at consumer side. The quicker is the restoration after a fault, the less is the quantity of non-distribution energy.

## 1.5 關鍵效能指標

### 1.5 Key performance indicators

關鍵效能指標			
Key performance indicators			
ID	名稱 Name	說明 Description	對所提及使用案例目標之參引 Reference to mentioned use case objectives

SAIDI	系統平均中斷持續時間 指標 System average interruption duration index	停電管理：量測供電之可靠性  SAIDI = (所有用戶中斷持續時間總和)/(所服務的用戶總數)  Outage management: Measure reliability of power supply SAIDI = (sum of all customer interruption durations)/(total number of customers served)	改善效能指標  Improve performance indexes
CAIDI	用戶平均中斷持續時間 指數 Customer average interruption duration index	停電管理：量測供電之可靠性  CAIDI = (所有用戶中斷持續時間總和)/(用戶中斷總數)  Outage management: Measure reliability of power supply CAIDI = (sum of all customer interruptions duration)/(total number of customer interruptions)	改善效能指標  Improve performance indexes
ASUI	平均服務不可用指數 Average service unavailability index	停電管理：量測供電之可靠性  ASUI = SAIDI / 8760  Outage management: Measure reliability of power supply ASUI = SAIDI/8760	改善效能指標  Improve performance indexes

## 1.6 使用案例條件

### 1.6 Use case conditions

使用案例條件 <i>Use case conditions</i>
假設 <i>Assumption</i>
<ul style="list-style-type: none"> <li>將考量自動重新供電之人身設備安全條件。</li> <li>Safety conditions for automatic re-supply to be considered.</li> </ul>
先設條件 <i>Prerequisite</i>
<ul style="list-style-type: none"> <li>配電保護裝置於出現故障時出反應。</li> <li>The distribution protection device is reacting in the presence of a fault.</li> </ul>

<ul style="list-style-type: none"> <li>• 儲存足夠電能並可用於通訊。</li> <li>• Enough energy is stored and available for communicating.</li> </ul>
<ul style="list-style-type: none"> <li>• 電網係持續地監視。</li> <li>• The grid is continuously monitored.</li> </ul>
<ul style="list-style-type: none"> <li>• 通用架構組件與駐存 FLISR 之控制中心間的通訊系統正常運作。</li> <li>• Communication system between generic architectural component and control center where FLISR is hosted is operational.</li> </ul>
<ul style="list-style-type: none"> <li>• 電網拓樸已知並反映真實之拓樸。</li> <li>• The grid topology is known and reflects the real topology.</li> </ul>
<ul style="list-style-type: none"> <li>• 電網電能路徑已知並反映真實路徑(有效狀態)。</li> <li>• The grid energy path is known and reflects the real path (effective status).</li> </ul>

### 1.7 針對分類/對映之使用案例的進一步資訊

#### 1.7 Further information to the use case for classification/mapping

分類資訊 <i>Classification information</i>
對其他使用案例之反應 <i>Reaction to other use cases</i>
配電管理系統，針對各情境之子使用案例(例如饋線自動化) Distribution management system, sub use cases for each scenario (e.g. feeder automation)
深度之層級 <i>Level of depth</i>
詳細 Detailed
優先序化 <i>Prioritisation</i>
高 High
通用、地區或國家關係 <i>Generic, regional or national relation</i>
通用 Generic

使用案例之本質 <i>Nature of the use case</i>
系統使用案例 System use case
用以分類之進一步關鍵詞 <i>Further keywords for classification</i>
故障偵測、自動復原、自動化饋線組態 Fault detection, automatic restoration, automatic feeder configuration

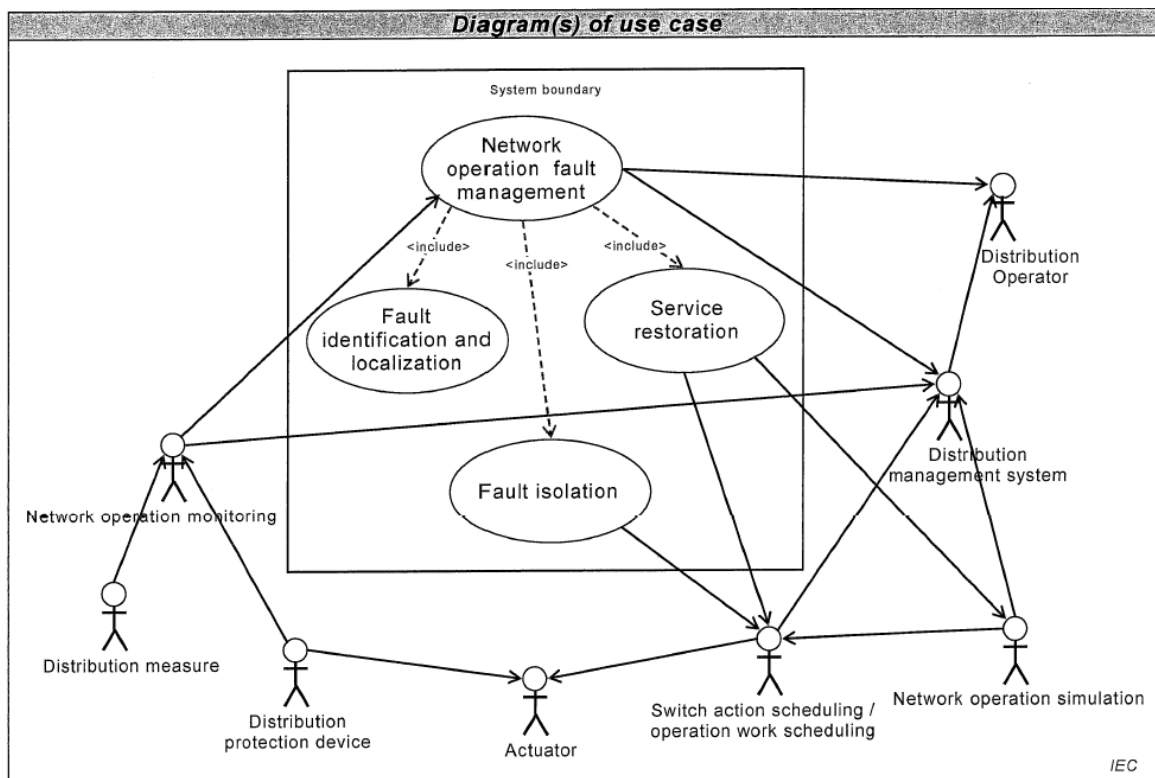
### 1.8 一般備註

#### 1.8 General remarks

一般備註 <i>General remarks</i>
基於不同電網拓撲，使用案例可不同。此說明最適合弱網狀網路及 FLISR 應用之集中化執行。 Based on different grid topologies, the use case may differ. This description fits the best to a weakly meshed network and a centralised execution of the FLISR application.

### 2.使用案例之圖表

#### 2 Diagrams of use case



### Diagrams of use case 使用案例之圖表

System boundary 系統邊界

Network operation fault management 網路運作故障管理

<include> <包括>

Fault identification and localization 故障識別及定位

Service restoration 服務復原

Fault isolation 故障隔離

Network operation monitoring 網路運作監視

Distribution measure 配電量測

Distribution protection device 配電保護裝置

Distribution operator 配電營運者

Distribution management system 配電管理系統

Actuator 致動器

Switch action scheduling / operation work scheduling 開關動作排程/運作工作排程

Network operation simulation 網路運作模擬

### 3. 技術細節

#### 3.1 行為者

##### 3 Technical details

##### 3.1 Actors

行為者 Actors	
分群 Grouping	群組說明 Group description
配電網 Distribution grid	<p>表示對用戶配送電力之基礎設施及組織(且越加自當地分散的發電機(如 PV)收集電力)。</p> <p>Representing the infrastructure and organization which distributes electricity to customers (and more and more collects electricity from local decentralized generators like PV).</p>

行為者名稱 Actor name	行為者型式 Actor typ	行為者說明 Actor description	特定於此使用案例之進一步資訊 Further information specific to this use case
開關動作排程 / 運作工作排程 Switch action scheduling/operation work scheduling	應用 Application	<p>開關動作排程針對處置與開關次序公式化相關之所有層面、草擬運作指導綱要、派遣維修工班，並通知受影響的用戶提供支援。其輔助收集相關資料且以所請求之各種形式交付。</p> <p>Switch action scheduling provides supports for handling all aspects relevant to switch order formulation, drawing up operating guidelines, dispatching repair crews and informing customers affected. It assists in collecting the related data and delivering it in the various forms required.</p>	IEC 61968-1

	應用 Application		
網路運作監視 Network operation monitoring	應用 Application	網路運作監視行為者監督網路拓撲、連接及負載狀況，包括斷路器、開關狀態，以及控制設備狀態。其定位用戶電話投訴及現場工班。  Network operation monitoring actors supervise network topology, connectivity and loading conditions, including breaker and switch states, and control equipment status. They locate customer telephone complaints and field crews.	基於 IEC 61968-1  Based on IEC 61968-1
網路運作模擬 Network operations simulation	應用 Application	此組功能容許設施定義、準備並最佳化執行系統維護工作(發布/淨空單)，以及營運規劃所要求之運作序列。  This set of functions allows facilities to define, prepare and optimise the sequence of operations required for carrying out maintenance work on the system (release/clearance orders) and operational planning.	IEC 61968-1
配電管理系統 (DMS) Distribution management system (DMS)	應用 Application	提供應用以自集中位置(通常為控制中心)監視並控制配電網之系統。  DMS 通常具對其他系統(如 GIS 或 OMS)之介面。  A system which provides applications to monitor and control a distribution grid from a centralized location, typically the control center. A DMS typically has interfaces to other systems, like an GIS or an OMS.	SG-CG/M490/E
配電營運者 Distribution	人員 Person	運作配電系統之人員。  Person operating the distribution	NIST



operator		system.	
網路運作故障 管理 Network operations fault management	應用 Application	故障管理行為者增強故障定位、識別及區段化之速度，以便復原服務。其為客戶提供資訊，協調勞動力派遣並編制資訊用以統計。  Fault management actors enhance the speed at which faults are located, identified, and sectionalized so service can be resorted. They provide information for customers, coordinate with workforce dispatch and compile information for statistics.	IEC 61968-1
致動器 Actuator	裝置 Device	致動器是一種接受訊號並將其轉換為物理動作的感測器。換言之，致動器導致發生與發送給其資料相關的動作。其用於遠端運作開關和斷路器等設備。  An actuator is a transducer that accepts a signal and converts it to a physical action. In other words, an actuator causes an action to occur relating to the data that was sent to it. They are used to remotely operate devices such as switches and circuit-breakers.	SGIP 個體清單 SGIP entity list
配電量測 Distribution measure	應用 Application	由提供現場電力流及系統狀況可視性之行為者所執行。未來，量測可能內建於電網中之表計、變壓器、饋線、開關及其他裝置中。示例為透過 SCADA 系統自遠端終端單元(RTU)收集數位及類比量測值，並將其提供予運作領域中之電網控制中心。  Performed by actors that provide	NIST 概念模型 NIST conceptual model

		visibility into the flow of power and the condition of the systems in the field. In the future, measurement might be found in built into meters, transformers, feeders, switches and other devices in the grid. An example would be the digital and analog measurements collected through the SCADA system from a remote terminal unit (RTU) and provide to grid control center in the operation domain.	
配電保護裝置 Distribution protection device	裝置 Device	<p>對系統中可能導致停電、限電或設備損壞之故障，以及其他事件做出快速反應的行為者。旨在維持高水準可靠性及電能品質。示例包括 FACT 裝置、開關、電路中斷器、電容器、電抗器、熔線。</p> <p>Actors that react rapidly to faults and other events in the system which might cause power outages, brownouts, or the destruction of equipment. Performed to maintain high levels of reliability and power quality. Example include FACTs devices, switches, circuit interrupters, capacitors, reactors, fuses.</p>	SGIP 個體清單 SGIP entity list

### 3.2 參引

#### 3.2 References

參引 References						
編號 No.	參引型式 References type	參引 Reference	狀態 Status	使用案例上之影響 Impact on use case	發起者/組織 Originator/organisation	鏈接 Link
	標準	IEC 61850, IEC			IEC TC 57	

	Standards	60870-5-10X、 IEC 61968-1				
		WGSP-0100 使 用案例 FLIR WGSP-0100 use case FLIR		基本輸入(基於 TC 57 使用案例) Basic input (based on a TC 57 use case)	智慧電網協調 群組(歐洲) Smart grid coordination group (Europe)	

## 4.使用案例之逐步分析

## 4.1 情境之概觀

## 4 Step by step analysis of use case

## 4.1 Overview of scenarios

情境條件 Scenario conditions						
編號 No.	情境名稱 Scenario name	情境說明 Scenario description	主要行為者 Primary actor	觸發事件 Triggering event	先設條件 Pre-condition	後設條件 Post-condition
1	故障發生 Fault occurs	電網故障期間由現場裝置對控制中心所採取之運作及資訊流。 Action taken by field devices during grid failure and information flow to control center.	配電保護裝置 Distribution protection device	故障發生 Fault occurs	配電保護裝置係運作並正確地組態設定。 Distribution protection devices are operable and configured correctly.	部分電網處發生斷電。 Part of the grid where occurs is de-energized
2	故障定位 Fault location	控制中心應用互動以判定電網失效位置。 Interaction of control center application to determine the location of the grid failure.	網路運作故障管理 Network operations fault management	故障通知 Fault notification	故障通知係經由網路運作監視傳輸至網路運作故障管理。 Fault notification is transmitted via network	故障之位置已識別。 Location of the fault is identified.

					operation monitoring to the network operations fault management.	
3	故障隔離 Fault isolation	控制中心應用互動判定切換動作以隔離故障電網部分。 Interaction of control center application to determine switching actions to isolate faulty grid part,	網路運作故障管理 Network operations fault management	故障定位就緒 Fault localization ready	可識別故障位置。 The fault location could be identified.	故障設備與電網的健康部分隔離。 The faulty equipment is isolated from the healthy part of the grid.
4	系統復原 System restoration	控制中心應用互動判定切換動作以重新供電予斷電但無故障之電網部分。 Interaction of control center application to determine switching actions to resupply de-energized, but non faulty grid part.	網路運作故障管理 Network operations fault management	故障定位就緒 Fault localization ready	可隔離故障之設備。 The faulty equipment could be isolated.	除故障設備外，電網所有先前斷電之部分已重新供電。 Except of the faulty equipment all formerly de-energized parts of the grid are resupplied.
5	無定位可能 No localisation possible	故障定位演算法無法辨識故障位置後之資訊流。 Information flow after fault	網路運作故障管理 Network operations fault management	故障發生 Fault occurs	配電保護裝置係運作並正確地組態設定。 Distribution protection	無法定位故障位置。 The location of the fault is not possible.

		localization algorithm fails to identify fault location.			devices are operable and configured correctly.	
6	無隔離可能 No isolation possible	故障隔離演算法無法判定隔離切換序後後之資訊流。 Information flow after fault isolation algortihm fails to determine isolation switching sequence.	網路運作故障管理 Network operations fault management	故障通知 Fault notification	故障通知係經由網路運作監視傳輸至網路運作故障管理。 Fault notification is transmitted via network operation monitoring to the network operations fault management.	不可能更緊密地隔離故障設備。 There is no possibility for a closer isolation of the faulty equipment
7	重新通電不成功 Re-energizmg failed	故障隔離演算法無法判定復原切換序列後之資訊流。 Information flow after fault isolation algortihm fails to determine resoration switching sequence.	網路運作故障管理 Network operations fault management	故障定位就緒 Fault localization ready	可隔離故障之設備。 The faulty equipment could be isolated.	並非所有斷電但無故障之電網部分皆可復原。 Not all de-energized, but faultless parts of the grid could be restored.

## 4.2 情境

### 4.2 Scenarios

情境名稱：	編號 1 - 故障發生
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Scenario name:		No. 1 – Fault occurs						
步驟編號 Step No.	事件 Event	過程 / 活動 之名稱 Name of process/ activity	過程/活動之說明 Description of process/ activity	服務 Service	資訊產生者(行為 者) Informa-tion producer (actor)	資訊接收者(行為 者) Informa-tion receiver (actor)	所交換之資 訊(ID) Informa-tion exchanged (IDs)	要求、R- ID Require- ment, R- IDs
1	電網中發生故障 Fault occurs in the grid	跳脫 Tripping	變電所保護裝置偵測出電網故障，以消除目前故障。其實際上使受保護之資產斷電，例：徑向運作的網路中發生故障之部分。  Substation protection device detects a fault on the grid to eliminate the current fault. It de facto de-energizes the protected asset e.g. the part of the radial operated network where the fault occurred.	執行 Execute	配電保護裝置 Distribution protection device	致動器(斷路器) Acyuator (breaker)	跳脫命令 Tripping command	QoS-1
2	電網中發生故障 Fault occurs in the grid	故障通知 Fault notification	變電所保護裝置將訊號發送予網路運作監視。  Substation protection device sends signal to the network operation monitoring.	建立 Create	配電保護裝置 Distribution protection device	網路運作監視 Network monitoring	網路故障 Network fault	IS-1

3	斷路器跳脫 警示 Breaker trip alarm	資訊收集 Information collection	網路運作監視收集由網路運作監控所 提供與所發生之故障相關的所有傳入 資訊。 Network operations monitoring collects all incoming information provided by the network operation monitoring which is related to the occurred fault.	報告 Report	網路運作監視 Network monitoring	網路運作故障管 理 Network operations fault management	各種故障及 狀態資訊 Various fault and status information	IS-1
4	故障資料收 集就緒 Fault data collection ready	故障定位 Fault localisation	網路運作故障管理應用分析所收集之 故障資料，並識別故障設備(參照下個 情境)。 The network operations fault management application analyses the collected fault data and identifies the faulty equipment (see next scenario).	建立 Create	網路運作故障管 理 Network operations fault management	DMS	故障設備	QoS-2

情境名稱： Scenario name:		編號 2 - 故障定位 No. 2 – Fault location						
步驟編號 Step No.	事件 Event	過程/活動之 名稱 Name of	過程/活動之說明 Description of process/ activity	服務 Service	資訊產生者(行為 者) Informa-tion producer (actor)	資訊接收者(行為 者) Informa-tion receiver (actor)	所交換之資 訊(ID) Informa-tion exchanged	要求、R- ID Require- ment, R-



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		process/ activity					(IDs)	IDs
1	故障位置已 識別 Fault location identified	網路分析 Network analysis	網路運作故障管理分析故障設備周圍 之電網拓撲，並識別當斷開時將隔離故 障設備的該等開關。  The network operation fault management analyses the grid topology around the faulty equipment and identifies those switches which will isolate the faulty device when opened.	建立 Create	網路運作故障管 理 Network operations fault management	關關動作排程/運 作工作排程及運 作模擬 Switch action scheduling/ operation work scheduling & Network operations simulation	InfEx-4	
2	切換次序就 緒 Switching order ready	模擬饋線組 態 Simulation feeder configuration	模擬切換次序之效應並將模擬結果呈 現予配電營運者。  The effects of the switching order are simulated and the simulation results are presented to the distribution operator.	報告 Report	網路運作模擬 Network operations simulation	配電營運者 Distribution operator	InfEx-11	

情境名稱：		編號 3 - 故障隔離						
Scenario name:		No. 3 – Fault isolation						
步驟編號	事件	過程/活動之	過程/活動之說明	服務	資訊產生者(行為 者)	資訊接收者(行為 者)	所交換之資 訊(ID)	要求、R- ID
Step No.	Event		Description of process/ activity	Service				

		名稱 Name of process/ activity			Informa-tion producer (actor)	Informa-tion receiver (actor)	Informa-tion exchanged (IDs)	Require- ment, R- IDs
1	觸發切換序列 Trigger switching sequence	饋線重新組態設定 Feeder re-configuration	切換動作排程/運作工作排程自動觸發或由 DMS 運作者觸發以執行隔離切換序列。 The switch action scheduling/operation work scheduling is triggered either automatically or by the DMS operator to execute the isolation switching sequence.	執行 Execute	關關動作排程/運作工作排程 Switch action scheduling/ operation work scheduling	致動器 Acturators	InfEx-5	IS-1
2	切換命令 Switching commands	饋線回饋 Feeder feedback	現場運作者或配電量測依命令反應並報告執行之成功狀態。 The field operators or the distribution measure react according to the commands and report the success status of the execution.	報告 Report	現場運作者/配電量測 Field operators/ distributoin measure	網路運作監視 Network monitoring	InfEx-6	IS-1 、 QoS-3
3	切換序列之成功執行 Successful execution of	新網路組態之確認 Confirmation of new	網路運作監視查證隔離是否成功並更新資料模型。 The network operations monitoring verifies the success of the isolation and	報告 Report	網路運作監視 Network monitoring	DMS	InfEx-11	

	switching sequence	network configuration	updates the data model.					
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情境名稱：		編號 4 - 系統復原						
Scenario name:		No. 4 – System restoration						
步驟編號 Step No.	事件 Event	過程/活動之 名稱 Name of process/ activity	過程/活動之說明 Description of process/ activity	服務 Service	資訊產生者(行 為者) Informa-tion producer (actor)	資訊接收者(行 為者) Informa-tion receiver (actor)	所交換之資 訊(ID) Informa-tion exchanged (IDs)	要求、R- ID Require- ment, R- IDs
1	成功之隔離 Successful isolation	針對復原之 饋線建議 Suggestion of feeder for restoration	網路運作故障管理分析健康但斷電設備之電網拓撲，並判定將為其復原電能的開關。 The network operations fault management analyses the grid topology of the healthy, but de-energized equipment and determines switches which will restore energy to them.	建立 Create	網路運作故障管理 Network operations fault management	關關動作排程/ 運作工作排程及 運作模擬 Switch action scheduling/ operation work scheduling & Network operations simulation	InfEx-12	
2	復原提議可	針對復原之	網路運作模擬所提出之切換動作的效	執行	網路運作模擬		(僅內部)	

	用 Restoration proposal available	饋線建議 Suggestion of feeder for restoration	應並驗證運行安全性。 The network operations simulation simulated the effects of the proposed switching actions and verifies the operation safety.	Execute	Network operations simulation		(only internal)	
3	切 換 次 序 就 緒 Switching order ready	模擬之顯示 Display of simulation	切 換 次 序 之 模 擬 結 果 呈 現 予 配 電 營 運 者。 The simulation results of the switching order are presented to the distribution operator.	報告 Report	網路運作模擬 Network operations simulation	配電營運者 Distribution operator	InfEx-11	
4	觸 發 切 換 序 列 Trigger switching sequence	用 以 復 原 之 切 換 斷 路 器 Switching breakers for restoration	切 換 動 作 調 度 / 運 作 工 作 調 度 自 動 觸 發 或 由 配 電 營 運 者 觸 發 以 執 行 復 原 切 換 序 列。 The switch action scheduling/operation work scheduling is triggered either automatically or by the distribution operator to execute the restoration switching sequence.	執行 Execute	關 關 動 作 排 程 / 運 作 工 作 排 程 Switch action scheduling/ operation work scheduling	現 場 致 動 器 Field actuators	InfEx-5 InfEx-6	IS-1
5	切 換 序 列 之 成 功 執 行 Successful	復 原 後 之 饋 線 回 饋 Feeder	網 路 運 作 監 視 查 證 復 原 是 否 成 功 並 更 新 資 料 模 型。 The network operations monitoring	報告 Report	網路運作監視 Network monitoring	DMS	InfEx-7 InfEx-11	

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	execution of switching sequence	feedback after restoration	verifies the success of the resoration and updates the data model.					
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情境名稱：		編號 5 - 無定位可能						
Scenario name:		No. 5 – No localisation possible						
步驟編號 Step No.	事件 Event	過程/活動之 名稱 Name of process/ activity	過程/活動之說明 Description of process/ activity	服務 Service	資訊產生者(行為 者) Informa-tion producer (actor)	資訊接收者(行為 者) Informa-tion receiver (actor)	所交換之資 訊(ID) Informa-tion exchanged (IDs)	要求、R- ID Require- ment, R- IDs
1、2		參照編號 1 See No. 1						
3Err	故障資料收集就緒 Fault data collection ready	定位錯誤 Localization error	網路運作故障管理應用分析已收集故障資料，但無法判定故障位置。 The network operation fault management application analyses the collected fault data but is not able to determine the fault location.	取消 Cancel	網路運作故障管理 Network operations fault management	配電營運者 Distribution operator	InfEx-8	

情境名稱：		編號 6 - 無隔離可能						
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Scenario name:		No. 6 – No isolation possible						
步驟編號 Step No.	事件 Event	過程/活動之 名稱 Name of process/ activity	過程/活動之說明 Description of process/ activity	服務 Service	資訊產生者(行為 者) Informa-tion producer (actor)	資訊接收者(行為 者) Informa-tion receiver (actor)	所交換之資 訊(ID) Informa-tion exchanged (IDs)	要求、R- ID Require- ment, R- IDs
1	故障位置已 識別 Fault location identified	隔離錯誤 Isolation error	網路運作故障管理應用分析故障設備 周圍之電網拓撲並識別但未發現於斷 開時隔離故障設備的開關。  The network operation fault management application analyses the grid topology around the faulty equipment and identifies but can not find switchs which will isolate the faulty device when opened.	取消 Cancel	網路運作故障管 理 Network operations fault management	配電營運者 Distribution operator	InfEx-9	

情境名稱：		編號 7 - 無隔離可能						
Scenario name:		No. 6 – No isolation possible						
步驟編號 Step No.	事件 Event	過程/活動之 名稱 Name of	過程/活動之說明 Description of process/ activity	服務 Service	資訊產生者(行為 者) Informa-tion	資訊接收者(行為 者) Informa-tion	所交換之資 訊(ID) Informa-tion	要求、R- ID Require- ment, R-

		process/ activity			producer (actor)	receiver (actor)	exchanged (IDs)	IDs
1	成功隔離 Successful isolation	復原錯誤 Restauration error	網路運作故障管理分析健康但斷電之設備的電網拓撲，並嘗試判定將為其復原電能的開關。無法針對所有斷電部件發現解決方案。  The network operations fault management analyses the grid topology of the healthy, but de-energized equipment and tries to determine switches which will restore energy to them. A solution can not be found for all de-energized parts.	取消 Cancel	網路運作故障管理 Network operations fault management	配電營運者 Distribution operator	InfEx-10	
2ff			類似於 PS4，但僅適用於已發現之解決方案。  Similar to PS4, but only for found solution.					

## 5. 所交換之資訊

## 5 Information exchanged

所交換之資訊 <i>Information exchanged</i>			
所交換資訊 ID Information exchanged ID	資訊之名稱 Name of information	所交換資訊之說明 Description of information exchanged	要求、R-ID Requirement, R-IDs
InfEx-1	跳脫命令 Trip command	將故障設備斷電。 De-energizing the fault equipment.	SynInt-1
InfEx-2	網路故障 Network fault	偵測出網路故障，此處為通用。 Detected network fault, here generic.	SynInt-1
InfEx-3	故障設備 Fault equipment	識別之故障設備。 Identified fault equipment.	SynInt-1
InfEx-4	建議之饋再重新組態設定 Suggested feeder reconfiguration	提出如何重新組態設定電網拓樸以重新為盡可能多之用戶供電的建議。 Proposal how to reconfigure the grid topology to re-energize as much as possible customers.	Saf-1
InfEx-5	饋線斷開/閉合命令 Feeder open/close commands	對現場致動器或操運作者傳訊。 Signal to actuators in the field or to operator.	SynInt-1
InfEx-6	饋線之斷開/閉合 open/close of feeders	對斷開/閉合命令之回應報告。 Report of response to open/close command.	SynInt-3
InfEx-7	新饋線地點之回饋 Feedback of new feeder position	對 DMS 運作者之新拓樸的視覺化。 Visualization of new topology to DMS operator.	SynInt-2
InfEx-8	錯誤定位 Error localization	錯誤訊息說是故障之定位係屬不可能。	SynInt-2



		Error message saying that the localization of the fault was not possible.	
InfEx-9	錯誤隔離 Error isolation	錯誤訊息說是無法更接近地隔離故障設備。  Error message saying that the faulty equipment can not be isolated closer.	SynInt-2
InfEx-10	錯誤復原 Error resauration	錯誤訊息說是所有斷電部件能復原。  Error message saying that all de-energized parts can be restored.	SynInt-2
InfEx-11	電網狀態 Grid state	運作者顯示器中之電網狀態視覺化(單線圖、表格等)  Grid status visualization in operator display (one-line-diagrams, tabulars,...)	SynInt-2
InfEx-12	網路元件 Network element	控制中心資料模型中所使用電網設備之唯一 ID。  Unique ID of grid equipment used in the control center data model.	SynInt-1

## 6. 要求事項(選項)

### 6 Requirements (optional)

要求事項(選項) <i>Requirements (optional)</i>		
種類 ID Category ID	要求事項之種類 Category for requirements	種類說明 Category description
3.2	SynInt	語法互運性。 Syntactic interoperability
要求、R-ID Requirement,	要求名稱 Requirement	要求說明 Requirement description

R-ID	name	
SynInt-1	唯一 ID Unique ID	傳輸之物件 ID 係屬唯一。 The transmitted ID of an object to be unique.
SynInt-2	資訊呈現 Inf presentation	該資訊以可用且符合人體工學的方式呈現。 The information has be presented in a usable and ergonomic way.
SynInt-3	回傳代碼 Return code	應用之回傳代碼須告知成功或不成功。 Return code of application has to inform about success or failure.

要求事項(選項) <i>Requirements (optional)</i>		
種類 ID Categor ID	要求事項之種類 Category for requirements	種類說明 Category description
6.7	QoS	服務品質要求。 Quality of service requirement.
要求、R-ID Requirement, R-ID	要求名稱 Requirement name	要求說明 Requirement description
QoS-1	信號回應時間 Signal response time	待發送之訊號 < 15 毫秒。 Signal to be sent < 15 milliseconds.
QoS-2	識別 Identification	精確地識別地點或設備。 Position or equipment to be identified precisely.
QoS-3	信號回應時間 Signal response time	待發送之訊號 < 30 秒。 Signal to be sent < 30 seconds

要求事項(選項) <i>Requirements (optional)</i>		
種類 ID Categor ID	要求事項之種類 Category for requirements	種類說明 Category description

7.1	IS	資訊系統及通訊保護(資訊安全)。 Information system and communication protection (information security).
要求、R-ID Requirement, R-ID	要求名稱 Requirement name	要求說明 Requirement description
IS-1	IS 檢查 1 IS check 1	待鑑別之訊號；完整性檢查。 Signals to be authentication; integrity checked.

要求事項(選項) <i>Requirements (optional)</i>		
種類 ID Category ID	要求事項之種類 Category for requirements	種類說明 Category description
7.4	Saf	人身設備安全及風險評鑑。 Safety and risk assessment.
要求、R-ID Requirement, R-ID	要求名稱 Requirement name	要求說明 Requirement description
Saf-1	人身設備安全檢查 1 Safety check 1	須依人身設備安全要求事項檢查應用結果。 Application results have to be checked against safety requirements.

## 7. 共同用語及定義

### 7 Common terms and definitions

共同用語及定義 <i>Common terms and definitions</i>	
用語 Term	定義 Definition
SAIDI	系統平均中斷持續時間指標 System average interruption duration index

SAIFI	系統平均中斷頻率指數 System average interruption frequency index
ASUI	平均服務不可用指數 Average service unavailability index
PBR	高效能式費率 Performance based rates
FLISR	故障定位、隔離及系統復原 Fault location, isolation and system restoration
GIS	地理資訊系統 Geographic information system
OMS	停電管理系統 Outage management system
NIST/SGIP	美國國家標準技術研究院/智慧電網互運性計畫 National institute of standards and technology/Smart grid interoperability plane
SCADA	監控及資料擷取 Supervisory control and data acquisition
RTU	遠端終端單元 Remote terminal unit
FACTS	彈性交流輸電系統 Flexible alternating current transmission system

## 8. 客製化資訊(選項)

### 8 Custom information (optional)

客製化資訊(選項) <i>Custom information (optional)</i>		
關鍵詞 Key	值 Value	參引節次 Refers to section

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**相對應國際標準**

IEC 62351-5:2023, Power systems management and associated information exchange – Data and communications security – Part 5: security for IEC 60870-5 and derivatives

## 名詞對照

**A**

activity step

活動步驟

area

區域

**C**

canonical data model, CDM

正準資料模型

clearance

淨空

cluster

叢集

conceptual description

概念說明

constraint

限制事項

**D**

domain

領域

**E**

electro-mobility

電氣行動機制

**F**

fault localization

故障定位

**G**

generic use case

通用使用案例

**I**

identification number, ID

識別碼

identifier

識別符

individual use case

個別使用案例

intelligent electronic device, IED

智慧電子裝置

**M**

meter operator

表計營運者

## **N**

namespace

名稱空間

narrative

敘事

## **O**

operator

運作者；營運者

## **P**

performance based rate, PBR

效能式費率

primary use case

主要使用案例

profile

剖繪

## **R**

recommendations

建議事項

regional

地區

regional transmission operator, RTO

地區輸電營運者

remote terminal unit, RTU

遠端終端單元

repository

儲存庫

requirements

要求事項

role

角色

## **S**

scenario

情境

secondary use case

次要使用案例

semantic model

語意模型

smart grid

智慧電網

smart grid architecture model, SGAM

智慧電網架構模型

specialized use case

特殊化使用案例



system average interruption duration index, SAIDI

系統平均中斷持續時間指標

## **U**

unified modeling language, UML

統一建模語言

use case

使用案例

use case repository, UCR

使用案例儲存庫

use case template

使用案例模板

## **Z**

zone

分區