IEC 62325-451-1

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Framework for energy market communications – Part 451-1: Acknowledgement business process and contextual model for CIM European market

Cadre pour les communications pour le marché de l'énergie – Partie 451-1: Processus métier d'accusé de réception et modèle contextuel pour le marché européen CIM

IEC 62325-451-1:2017-01(en-fr)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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FOREWORD

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International Standard IEC 62325-451-1 has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

This second edition cancels and replaces the first edition published in 2013. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) Addition of an optional attribute ProcessType to the acknowledgement document to ease routing of incoming acknowledgement document instances to the appropriate application.
b) Clarification of the activity diagram for the acknowledgement process.
c) Addition of the list of constraints on datatypes.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
57/1789/FDIS	57/1819/RVD

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

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

A list of all the parts in the IEC 62325 series, published under the general title *Framework for energy market communications*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

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- withdrawn,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

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

INTRODUCTION

This document is one part of the IEC 62325 series for deregulated energy market communications.

The principal objective of the IEC 62325 series is to produce standards which facilitate the integration of market application software developed independently by different vendors into a market management system, between market management systems and market participant systems. This is accomplished by defining message exchanges to allow these applications or systems access to public data and exchange information independent of how such information is represented internally.

The common information model (CIM), i.e. IEC 62325-301, IEC 61970-301 and IEC 61968-11, specifies the basis for the semantics for message exchange.

This European style market profile is based on different parts of the CIM IEC standard and specifies the content of the messages exchanged.

This document provides for the European style market profile the generic technical and application acknowledgement document that can be used in all European style market processes. These market processes are based on the European regulations, and on the concepts of third party access and zonal markets.

This document was originally based upon the work of the European Transmission System Operators (ETSO) and then on the work of the European Network of Transmission System Operators (ENTSO-E) on electronic data interchange.

FRAMEWORK FOR ENERGY MARKET COMMUNICATIONS –

Part 451-1: Acknowledgement business process and contextual model for CIM European market

1 Scope

Based on the European style market contextual model (IEC 62325-351), this part of IEC 62325 specifies a UML package for the acknowledgment business process and its associated document contextual model, assembly model and XML schema for use within the European style electricity markets.

The relevant aggregate core components (ACCs) defined in IEC 62325-351 have been contextualized into aggregated business information entities (ABIEs) to satisfy the requirements of the European style market acknowledgment business process.

The contextualized ABIEs have been assembled into the acknowledgment document contextual model.

A related assembly model and an XML schema for the exchange of acknowledgement information between market participants is automatically generated from the assembled document contextual model.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC TS 61970-2, *Energy management system application program interface (EMS-API) – Part 2: Glossary*

IEC 62325-351, *Framework for energy market communications – Part 351: CIM European market model exchange profile*

IEC 62325-450, *Framework for energy market communications – Part 450: Profile and context modelling rules*

IEC 62361-100, *Power systems management and associated information exchange – Interoperability in the long term – Part 100: CIM profiles to XML schema mapping*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC TS 61970-2 and the following apply.

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

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

3.1
aggregate business information entity
ABIE
re-use of an aggregate core component (ACC) in a specified business

Note 1 to entry: This note applies to the French language only.

3.2
aggregate core component
ACC
collection of related pieces of business information that together convey a distinct business meaning, independent of any specific business context

Note 1 to entry: Expressed in modelling terms, this is the representation of an object class, independent of any specific business context.

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

[SOURCE: ISO 15000-5:2014, 3.2]

3.3
based on
IsBasedOn
use of an artefact that has been restricted according to the requirements of a specific business context

Note 1 to entry: This note applies to the French language only.

[SOURCE: IEC 62325-450:2013, 3.4]

3.4
business context
specific business circumstance as identified by the values of a set of context categories, allowing different business circumstances to be uniquely distinguished

[SOURCE: UN/CEFACT, *Unified Context Methodology Technical Specification*]

3.5
information model
representation of concepts, relationships, constraints, rules, and operations to specify data semantics for a chosen domain of discourse

Note 1 to entry: It can provide shareable, stable, and organized structure of information requirements for the domain context.

3.6
internal European market
IEM
market of any commodity, service, etc. within the European Community

Note 1 to entry: In particular, European Directives and Regulations define the energy IEM.

Note 2 to entry: These software systems in an electricity market may include support for capacity allocation, energy scheduling, ancillary or other services, real-time operations and settlements.

Note 3 to entry: This note applies to the French language only.

3.7
profile
basic outline of all the information that is required to satisfy a specific environment

4 Document contextual model and message assembly model basic concepts

4.1 Overview

IEC 62325-450 defines how to develop a set of CIM profiles that follows a layered modelling framework as outlined in Figure 1, going from the common information model (CIM, IEC 61968-11, IEC 61970-301 and IEC 62325-301) to different regional contextual models and their subsequent contextualized documents for information exchange, the final step being the message specifications for information interchange.

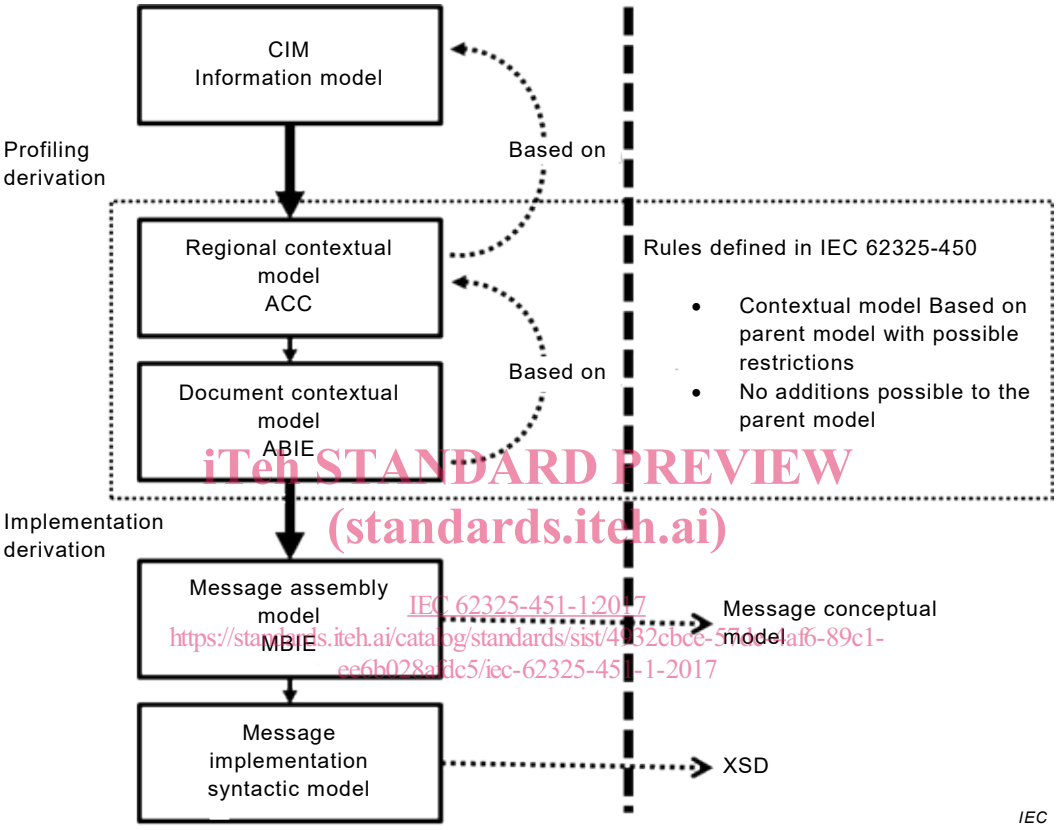

Figure 1 – IEC 62325-450 modelling framework

The regional contextual models are the basic core components that are necessary to build electronic documents for information interchange. This is defined in the European style market contextual model (IEC 62325-351). These core components are also termed aggregate core components (ACCs).

A document contextual model is based upon a specific business requirements specification and is constructed from the contextualization of the ACCs that can be found in the European style market contextual model. The contextualized ACCs at this stage are termed aggregate business information entities (ABIEs) These ABIEs are the constructs that are assembled together into a specific electronic document to satisfy the information requirements outlined in the business requirements specification. The transformation from an ACC to an ABIE shall respect the rules defined in IEC 62325-450.

Once a document contextual model has been built that satisfactorily meets the business requirements, a message assembly model can be automatically generated from it.

The XML schema then may be automatically generated from the message assembly model. If necessary, specific mapping can take place at this stage to transform the CIM class and attribute names into more market legacy names.

4.2 European style market package structure

Figure 2 describes the main package structure of the European style market profile.

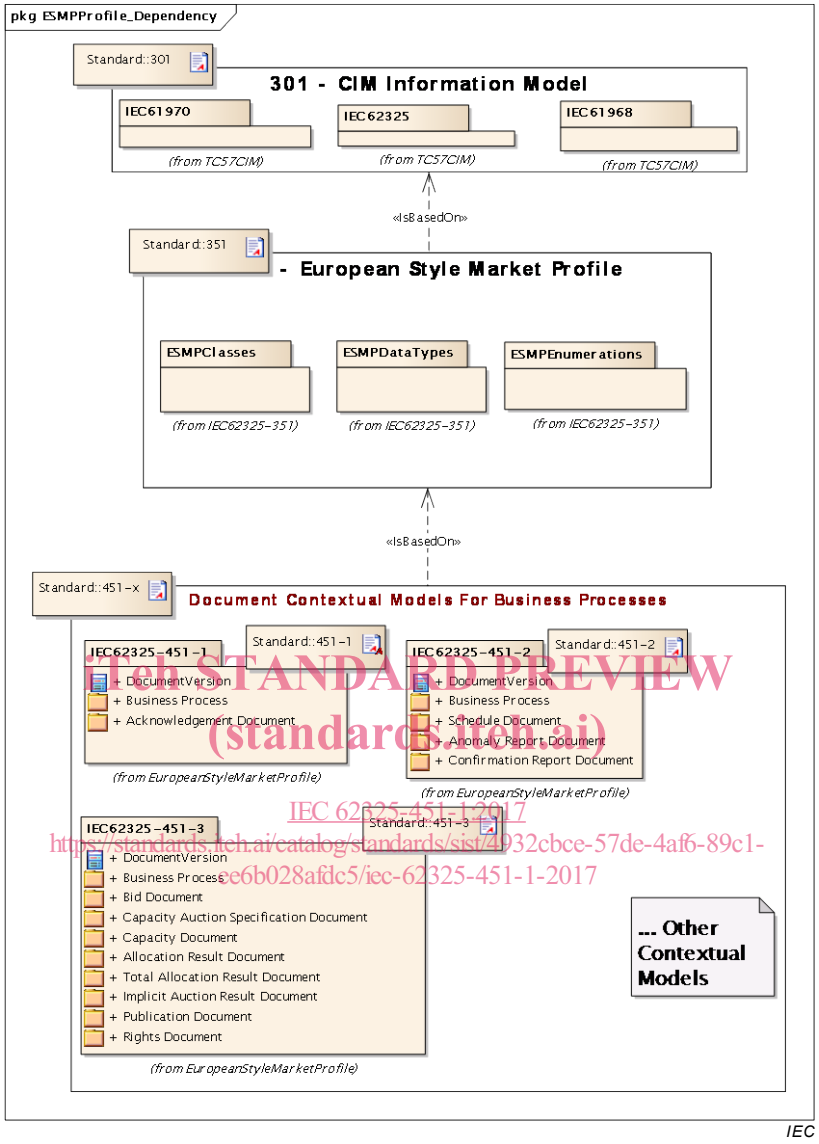

Figure 2 – Overview of European style market profile dependency

For each business process, a business process package is described in an IEC 62325-451-x (x from 1 to n) standard. A business process package contains:

- the document contextual model (ABIE) and the automatically generated message assembly model (MBIE) for each electronic document required to enable the completion of the business process. Each document is a sub-contextual model derived by restriction from the European style market profile;
- the XML schema of the business document that is automatically generated from the message assembly model.

The European style market profile (ESMP), as defined in IEC 62325-351, provides the core components permitted for use in an IEC 62325-451-x standard as all ABIEs shall be “based on” the IEC 62325-351 core components:

- ESMPClasses: Defining all the semi-contextual classes of the European style market profile derived by restriction from the CIM model.
- ESMPDataTypes: Defining all the core datatypes used within the ESMP classes.

All the core components that are used in every electronic document structure have been harmonized and centralized in the European style market profile. These core components are consequently the basic building blocks from which all electronic document ABIEs are derived.

4.3 From the European style market profile to the document contextual model

The document contextual model for a given business process is constructed by an information analyst who identifies all the information requirements necessary to satisfy the business process.

Once the information requirements have been identified, the information analyst identifies the related ACCs that are available in the European style market profile and contextualizes them to meet the information requirements. This contextualization step creates a set of aggregate business information entities (ABIEs).

In a final step the information analyst assembles the ABIEs together in a specific document contextual model package to form a document model satisfying the business requirements.

4.4 From the document contextual model to the message assembly model

Once the document contextual model has been finalized, the message assembly model may be automatically generated.

All document contextual models share the same core components and core datatypes. These are defined in the European style market profile (IEC 62325-351) and are contextualized and refined in all document contextual models (IEC 62325-451-x series) respecting the rules as described in IEC 62325-450.

4.5 From the assembly model to the XML schema

The final modelling step applies a standardized set of criteria in order to generate a uniform XML schema from the assembly model. This transformation process respects the rules defined in IEC 62361-100.

5 The acknowledgment business process

5.1 Business process definition

5.1.1 General

The acknowledgment business process is generic and can be used in all the electricity market business processes at two levels:

- system level – to detect syntax errors (XML parsing errors, etc.);
- application level – to detect semantic errors (invalid data, wrong process, etc.).

If there is a problem encountered at the first level, then a technical acknowledgement may be sent to inform the originator of the problem.

If errors are encountered at the second level or if the application can successfully process the information, then an application acknowledgement may be sent to inform the originator of the situation. Figure 3 provides the activity diagram of the acknowledgement process.

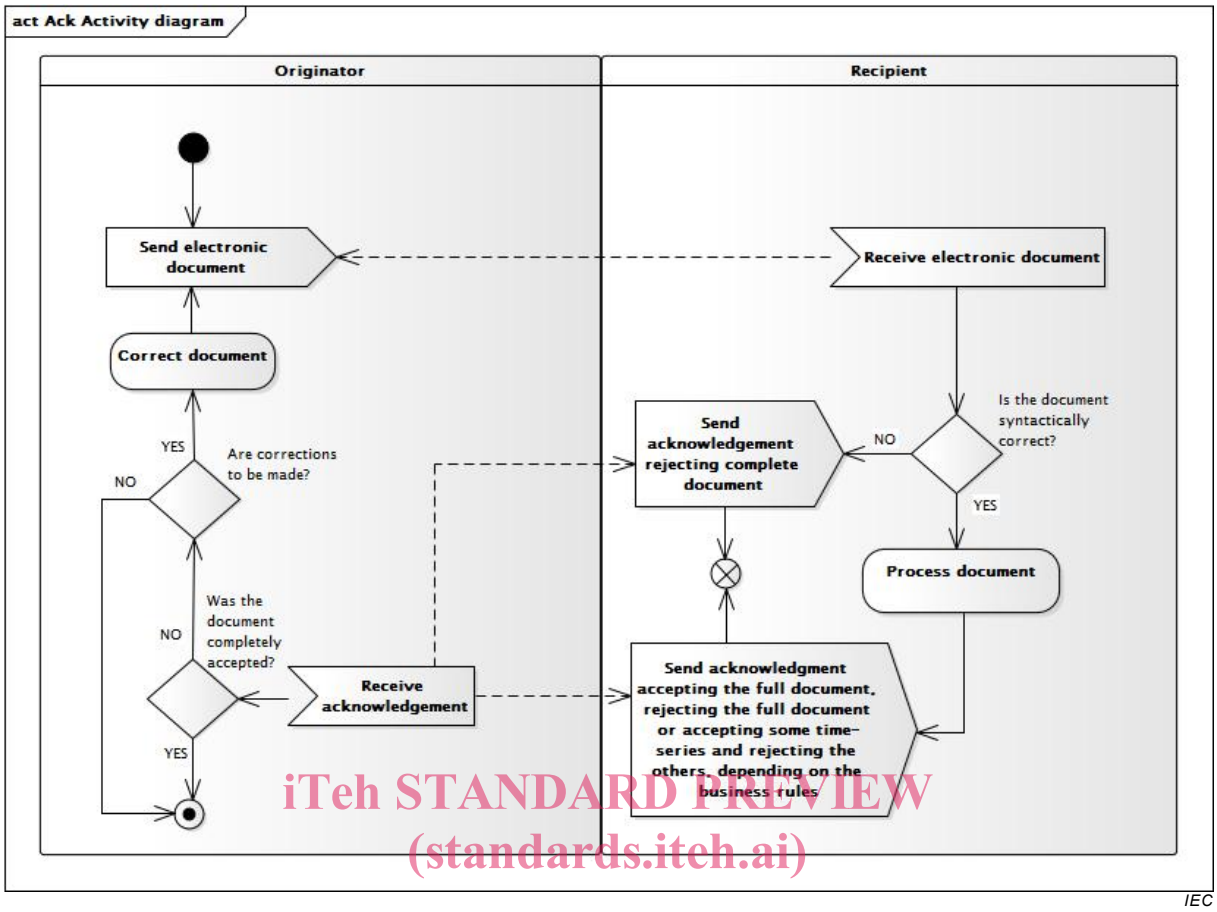

Figure 3 – Acknowledgement process

5.1.2 Technical acknowledgment

A technical acknowledgement occurs when an XML document is received that cannot be correctly processed for submission to the application. Such an error could occur for example whenever the XML parser cannot correctly parse the incoming document. Other instances could be the incapacity to correctly identify the originator of the document in relation to the process requested.

In such a case a technical acknowledgement can be sent to the document originator providing the information that the XML document in question cannot be correctly processed by the system.

5.1.3 Application acknowledgment

Within each business process of European style markets, business rules shall state whether or not an application acknowledgment is to be sent upon reception of an electronic document.

In particular, where the originator is in an “operator” type role (system operator, market operator, interconnection capacity allocator, etc.) and the recipient is in a “market participant” type role, all electronic documents sent by entities in the role of an operator shall be considered as received and correct, and the acknowledgement process is not required unless an acknowledgment document is required by a specific process.

Otherwise, upon reception, checks are to be carried out at the application level to assess that the received document can be correctly processed by the application. The originator is informed that:

- its document, which is stated as valid after this verification, is ready to be processed by the reception of an acknowledgement document accepting the document in question;