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Title: IEC 62325-451-1: Framework for energy market communications –
Part 451-1: Acknowledgement business process and contextual model for CIM European market

Introductory note

-

**ATTENTION
IEC – CENELEC
PARALLEL VOTING**

The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) for an International Standard is submitted for parallel voting.

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VOTE PARALLÈLE
IEC – CENELEC**

L'attention des Comités nationaux de l'IEC, membres du CENELEC, est attirée sur le fait que ce projet de comité pour vote (CDV) de Norme internationale est soumis au vote parallèle.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

FRAMEWORK FOR ENERGY MARKET COMMUNICATIONS –

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

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) Clarify the activity diagram for the acknowledgement process.
- c) Add the list of constraints on datatypes.

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

FDIS	Report on voting
57/XX/FDIS	57/XX/RVD

171
172 Full information on the voting for the approval of this standard can be found in the report on
173 voting indicated in the above table.

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

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

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

- 180 • reconfirmed,
- 181 • withdrawn,
- 182 • replaced by a revised edition, or
- 183 • amended.

184

185 The National Committees are requested to note that for this publication the stability date
186 is 2019.

187 THIS TEXT IS INCLUDED FOR THE INFORMATION OF THE NATIONAL COMMITTEES AND WILL BE
188 DELETED AT THE PUBLICATION STAGE.

189

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.

190

191 **Document history**

192 Any person intervening in the present document is invited to complete the table below before
193 sending the document elsewhere. The purpose is to allow all actors to see all changes
194 introduced and the intervening persons.

195 Any important message to IEC editors should also be included in the table below.

Name of intervening person	Document received		Brief description of the changes introduced	Document sent	
	From	Date		To	Date
Enrique Jimenez	Project leader		Update the document as per the 57/1634/DC	Project team	2016-02-15
Enrique Jimenez	Project leader		Following review of the document)	IEC TC57	2016-03-01
M.Noeth	M.Monti	2016-02-24	CDV document	CO	2016-03-10

196

197 This table will be removed by IEC editors before FDIS circulation (in case of IS) or before final
198 publication (in case of TS or TR).

199

200

INTRODUCTION

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

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

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

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

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

217 This part of IEC 62325 was originally based upon the work of the European Transmission
218 System Operators (ETSO)) and then on the work of the European Network of Transmission
219 System Operators (ENTSO-E) on electronic data interchange.

220

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 particular part of IEC 62325 series 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 contextualised into aggregated business information entities (ABIEs) to satisfy the requirements of the European style market acknowledgment business process.

The contextualised 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.

This new edition of IEC 62325-451-1 contains a new optional class and associations required to comply with new business development for European style market. In particular, the following changes have been made:

- Addition of an optional attribute `ProcessType` to the acknowledgment document to ease routing of incoming acknowledgment document instances to the appropriate application.
- Clarify the activity diagram for the acknowledgment process.
- Add the list of constraints on datatypes.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC TS 61970-2:2004, *Energy management system application program interface (EMS-API) – Part 2: Glossary*

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

IEC 62325-450:2013, *Framework for energy market communications - Part 450: Profile and context modelling rules*

259 IEC 62361-100, *Power systems management and associated information exchange –*
260 *Interoperability in the long term – Part 100: Naming and design rules for CIM profiles to XML*
261 *schema mapping*¹

262 **3 Terms and definitions**

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

265 **3.1**

266 **aggregate business information entity**

267 **ABIE**

268 re-use of an aggregate core component (ACC) in a specified business

269 **3.2**

270 **aggregate core component**

271 **ACC**

272 collection of related pieces of business information that together convey a distinct business
273 meaning, independent of any specific business context

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

276 [SOURCE: ISO/TS 15000-5:2005, Clause 9]

277 **3.3**

278 **based on**

279 **IsBasedOn**

280 use of an artefact that has been restricted according to the requirements of a specific
281 business context

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

283 **3.4**

284 **business context**

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

287 [SOURCE: ISO/TS 15000-5:2005, 4.6.2]

288 **3.5**

289 **information model**

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

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

294 **3.6**

295 **internal European market**

296 **IEM**

297 market of any commodity, service, etc. within the European Community

298 Note 1 to entry: In particular, European Directives and Regulation are defining the energy IEM.

299 Note 1 to entry: These software systems in an electricity market may include support for capacity allocation,
300 scheduling energy, ancillary or other services, real-time operations and settlements.

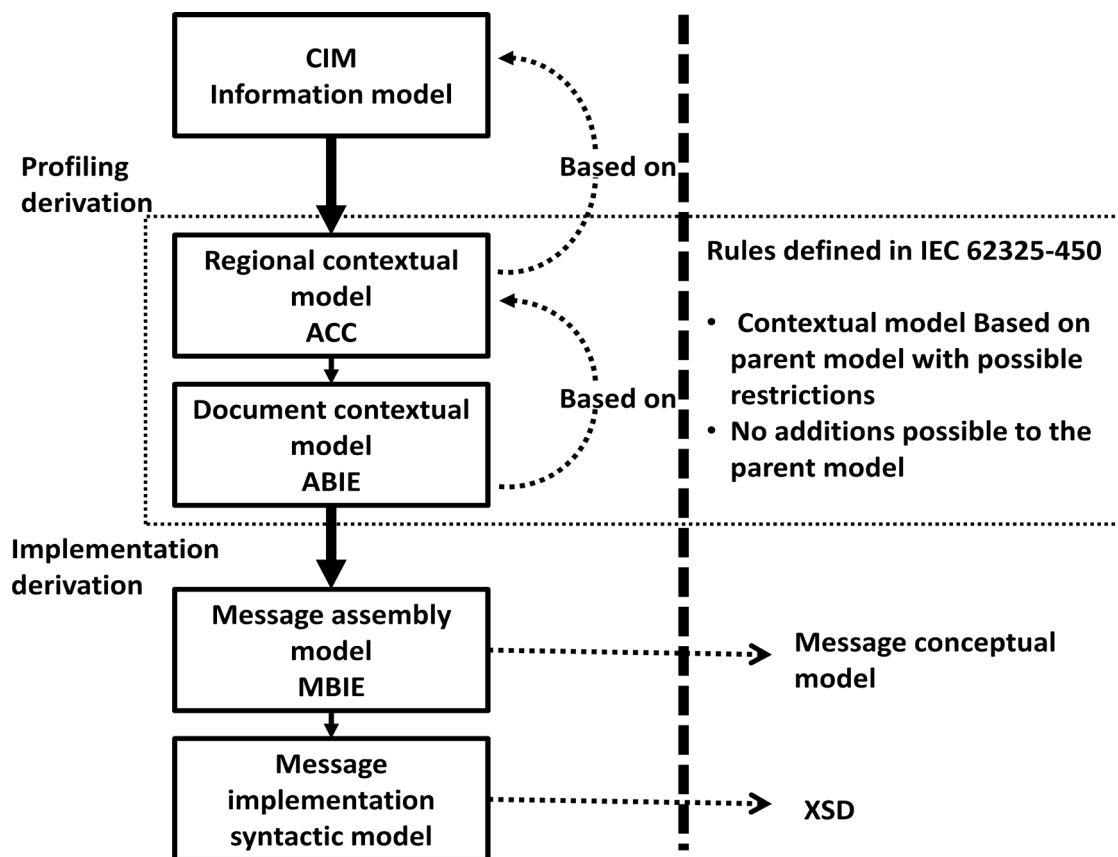
¹ To be published.

301 **3.7**
 302 **profile**
 303 basic outline of all the information that is required to satisfy a specific environment

304 **4 Document contextual model and message assembly model basic concepts**

305 **4.1 Overview**

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



311

312

Figure 1 – IEC 62325-450 modelling framework

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

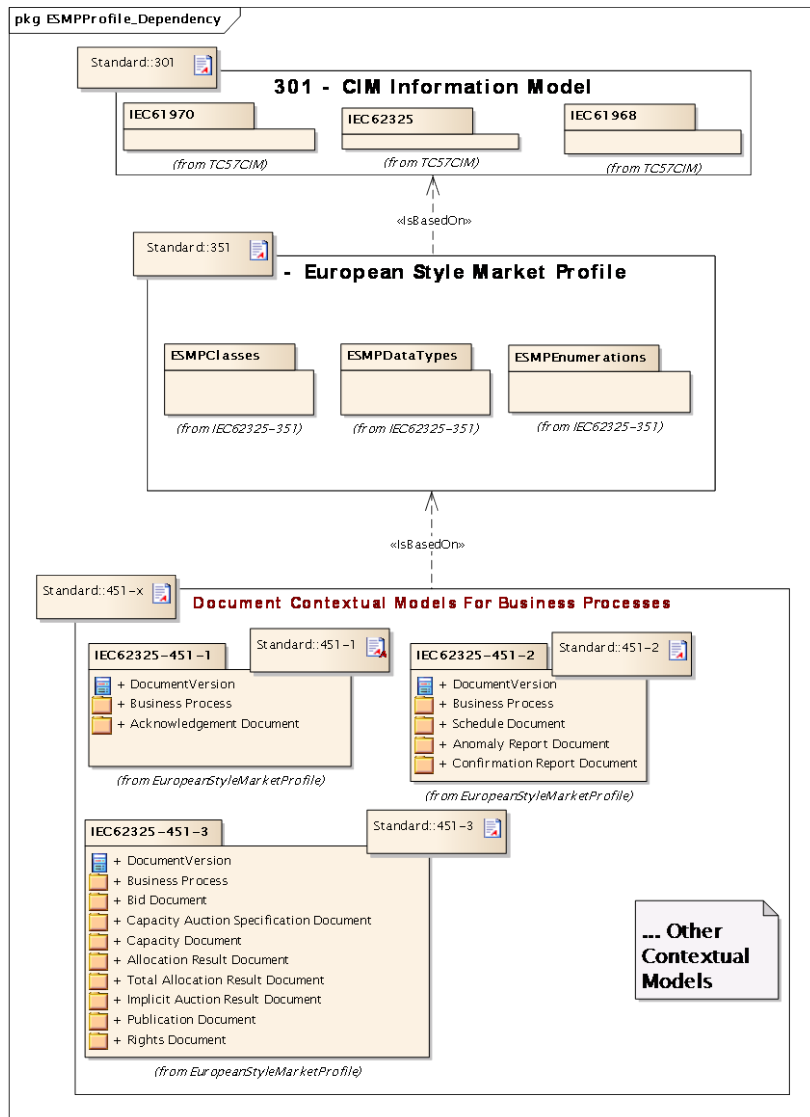
317 A document contextual model is based upon a specific business requirements specification
 318 and is constructed from the contextualisation of the ACCs that can be found in the European
 319 style market contextual model. The contextualised ACCs at this stage are termed aggregate
 320 business information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

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

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

329 **4.2 European style market package structure**

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



331

332 **Figure 2 – Overview of European style market profile dependency**

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

- 335
- 336 • The document contextual model (ABIE) and the automatically generated message
 337 assembly model (MBIE) for each electronic document required to enable the completion of
 338 the business process. Each document is a sub contextual model derived by restriction
 from the European style market profile.
 - 339 • The XML schema of the business document that is automatically generated from the
 340 message assembly model.

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

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

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

350 **4.3 From the European style market profile to the document contextual model**

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

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

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

360 **4.4 From the document contextual model to the message assembly model**

361 Once the document contextual model has been finalised, the message assembly model may
362 be automatically generated.

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

367 **4.5 From the assembly model to the XML schema**

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

371 **5 The acknowledgment business process**

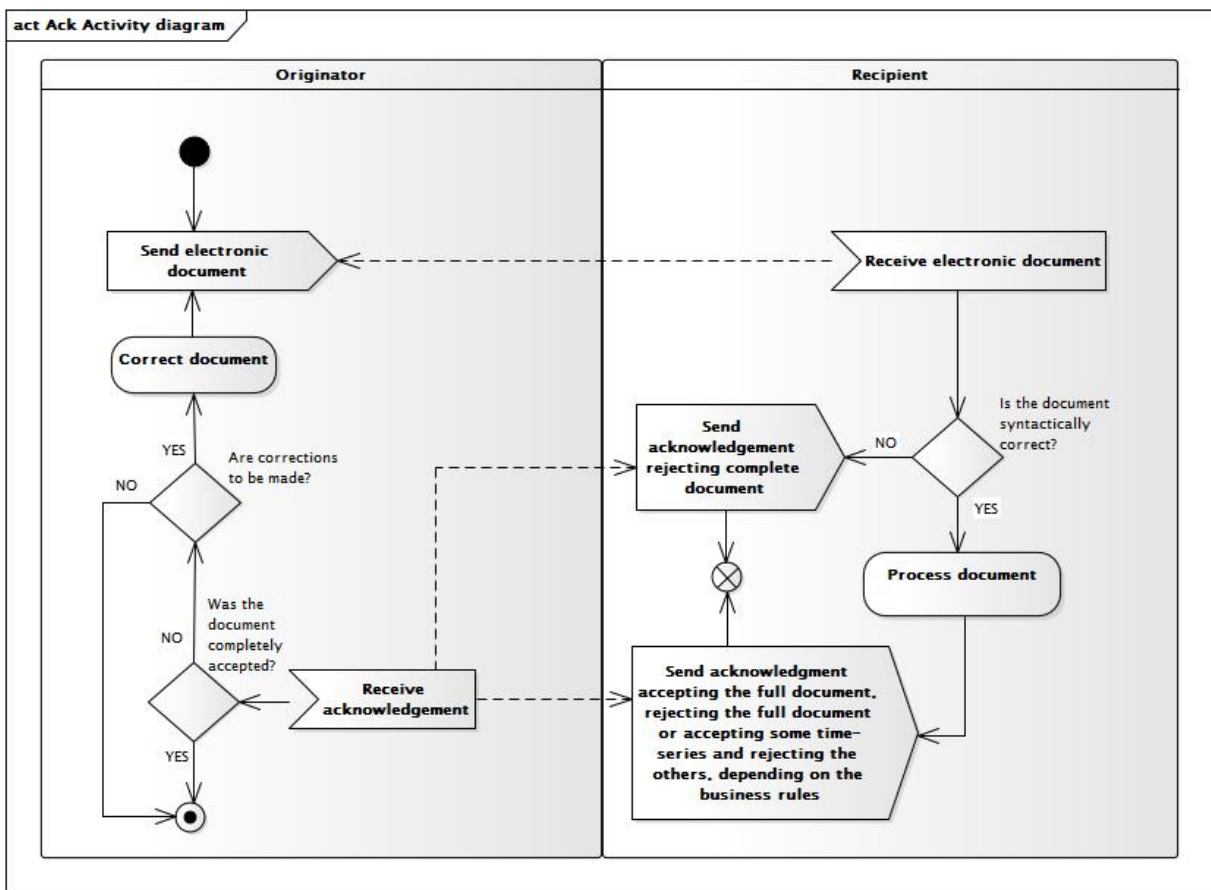
372 **5.1 Business process definition**

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

- 375 • System level: To detect syntax errors (XML parsing errors, etc.);
- 376 • Application level: To detect semantic errors (invalid data, wrong process, etc.).

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

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



382

383 **Figure 3 – Acknowledgement process**

384 **5.1.1 Technical acknowledgment**

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

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

393 **5.1.2 Application acknowledgment**

394 Within each business process of European style markets, business rules are to define stating
395 whether or not an application acknowledgment is to be sent upon reception of an electronic
396 document.

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

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

- 405 • Its document, that is stated as valid after this verification, is ready to be processed by
406 the reception of an acknowledgement document accepting the document in question;
- 407 • Its document is rejected for processing by the reception of an acknowledgement
408 document rejecting the document in question with details on the level of errors.

409 **5.2 Business rules for the acknowledgment document**

410 **5.2.1 General**

411 All the business rules described in IEC 62325-351 are also valid for this standard. Additional
412 rules are provided hereafter.

413 **5.2.2 Time**

414 For all time intervals, the start date and time is included in the scope of the interval whereas
415 the end date and time is excluded from the scope of the interval, i.e. [start date and time, end
416 date and time].

417 **5.2.3 Reason**

418 **5.2.3.1 General**

419 There shall be at least one Reason class at the document header level that provides the
420 information to either accept or reject the document.

421 If there are errors at the TimeSeries level as many Reason classes as necessary may be
422 used to provide the details of the error. Specifically it shall be used:

- 423 • To identify a TimeSeries which has been completely rejected;
- 424 • To identify a TimeSeries where there are selective errors at the Time_Period level.

425 A TimeInterval that is in error shall be identified in relation to its position in the incoming
426 document.

427 If there are errors at the Time_Period level as many Reason classes as necessary shall be
428 used to identify the error.

429 **5.2.3.2 Reason code examples**

430 Table 1, Table 2 and Table 3 provide examples of the possible combinations of the use of
 431 reason codes. These tables does not contains the whole set of reason codes.

432 **Table 1 - Codes used at the document header level**

Code	Reason
A01	Message fully accepted
A02	Message fully rejected
A03	Message contains errors at the Time series level
A51	Message identification or version conflict
A52	TimeSeries missing from new version of message
A53	Receiving party incorrect
A94	Document cannot be processed by receiving system

433 **Table 2 – Codes used at the TimeSeries level when there is a Reason code of A03 at the**
 434 **document header level**

Code	Reason
A20	TimeSeries fully accepted
A21	Time Series Accepted with specific time interval errors
A41	Resolution inconsistency
A50	Senders TimeSeries version conflict
A54	Global position not in balance
A55	TimeSeries identification conflict
A56	Corresponding TimeSeries not netted
A57	Deadline limit exceeded
A59	Not compliant with local market rules

435 **Table 3 – Codes used at the Period level when there is a Reason code A03 at the**
 436 **document header level and a code A21 at the TimeSeries level**

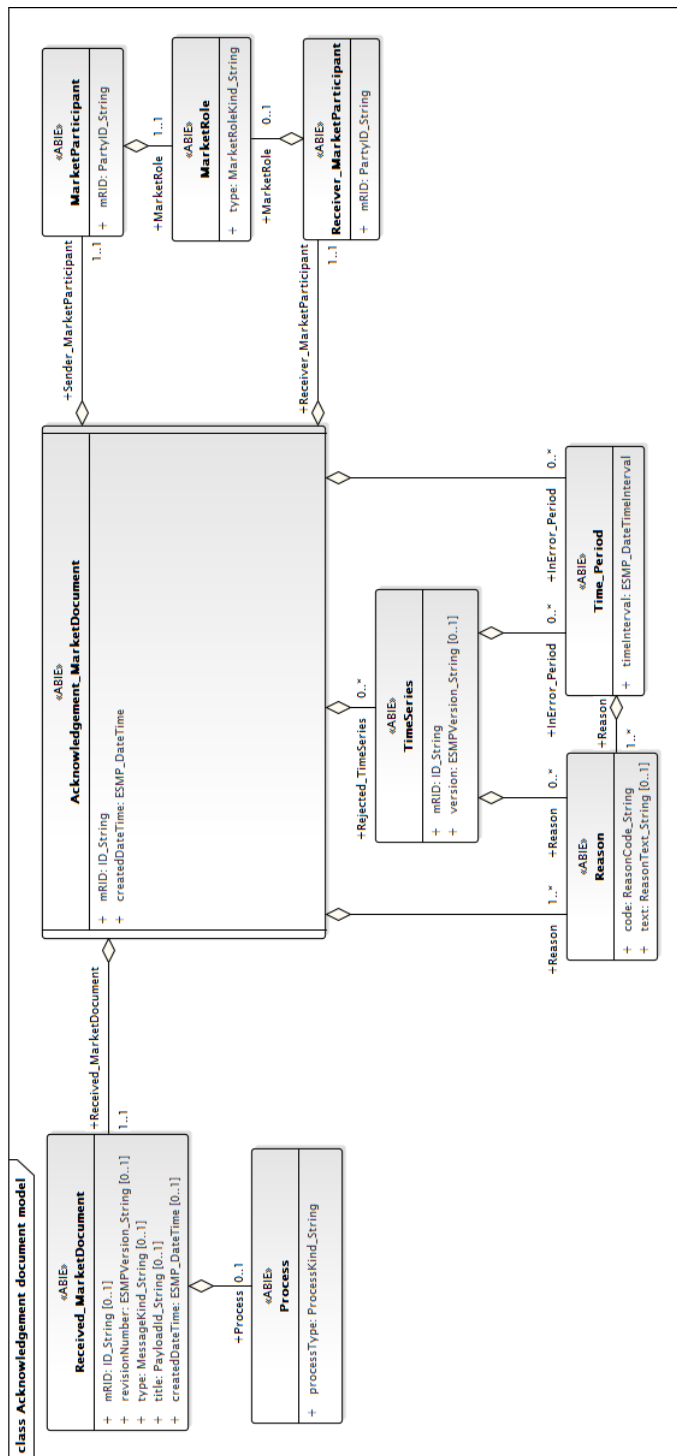
Code	Reason
A42	Quantity inconsistency
A46	Quantities must not be signed values
A49	Position inconsistency
A59	Not compliant with local market rules

437 **6 Contextual and assembly models**

438 **6.1 Acknowledgement contextual model**

439 **6.1.1 Overview of the model**

440 Figure 4 shows the model.



441

442

Figure 4 - Acknowledgement contextual model

443 **6.1.2 IsBasedOn relationships from the European style market profile**

444 Table 4 shows the traceability dependency of the classes used in this package towards the
445 upper level.

446 **Table 4 - IsBasedOn dependency**

Name	Complete IsBasedOn Path
Acknowledgement_MarketDocument	TC57CIM::IEC62325::MarketManagement::MarketDocument
MarketParticipant	TC57CIM::IEC62325::MarketCommon::MarketParticipant
MarketRole	TC57CIM::IEC62325::MarketCommon::MarketRole
Process	TC57CIM::IEC62325::MarketManagement::Process
Reason	TC57CIM::IEC62325::MarketManagement::Reason
Received_MarketDocument	TC57CIM::IEC62325::MarketManagement::MarketDocument
Receiver_MarketParticipant	TC57CIM::IEC62325::MarketCommon::MarketParticipant
Time_Period	TC57CIM::IEC62325::MarketManagement::Period
TimeSeries	TC57CIM::IEC62325::MarketManagement::TimeSeries

447

448 **6.1.3 Detailed Acknowledgement contextual model**

449 **6.1.3.1 Acknowledgement_MarketDocument root class**

450 An electronic document that is used to acknowledge the reception of a document and to
451 provide information concerning its basic validity.

452 Table 5 shows all attributes of Acknowledgement_MarketDocument.

453 **Table 5 - Attributes of Acknowledgement contextual
454 model::Acknowledgement_MarketDocument**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	mRID ID_String	The unique identification of the document being exchanged within a business process flow.
1	[1..1]	createdDateTime ESMP_DateTime	The date and time of the creation of the document.

455

456 Table 6 shows all association ends of Acknowledgement_MarketDocument with other classes.

457
458**Table 6 - Association ends of Acknowledgement contextual model::Acknowledgement_MarketDocument with other classes**

Order	mult.	Class name / Role	Description
2	[1..1]	MarketParticipant Sender_MarketParticipant	The identification of the party that is the originator of the acknowledgement. The originator of the acknowledgement is identified by a unique coded identification. This value should be the same as that found in the receiver identification of the document being acknowledged. The MarketParticipant that transmits the electronic document. Association Based On: ESMPClasses::MarketDocument.[] ----- ESMPClasses::MarketParticipant.MarketParticipant[0..*]
3	[1..1]	Receiver_MarketParticipant Receiver_MarketParticipant	The identification of the party who is the recipient of the acknowledgement. The recipient of the document is identified by a unique coded identification. This value should be the same as that found in the sender identification of the document being acknowledged. The MarketParticipant that receives the electronic document. Association Based On: ESMPClasses::MarketDocument.[] ----- ESMPClasses::MarketParticipant.MarketParticipant[0..*]
4	[1..1]	Received_MarketDocument Received_MarketDocument	This information identifies the document that has been received. The information is extracted from the received document. Association Based On: ESMPClasses::MarketDocument.[] ----- ESMPClasses::MarketDocument.MarketDocument[0..*]
5	[0..*]	TimeSeries Rejected_TimeSeries	The time series in the received document that has been rejected during the initial validation process. Association Based On: ESMPClasses::MarketDocument.[] ----- ESMPClasses::TimeSeries.TimeSeries[0..*]
6	[1..*]	Reason Reason	In case of a received document without error, only one Reason element is necessary to acknowledge it. However, if there are errors then there may be as many Reason elements as are necessary to describe any errors discovered in the received document. At least one reason element must appear associated with the header part of the document. The Reason associated with the electronic document header providing different motivations for the creation of the document. Association Based On: ESMPClasses::MarketDocument.[] ----- ESMPClasses::Reason.Reason[0..*]
7	[0..*]	Time_Period InError_Period	The time interval that is associated with the received document and which contains error. Association Based On: ESMPClasses::MarketDocument.[] ----- ESMPClasses::Time_Period.Period[0..*]

459

6.1.3.2 MarketParticipant

460 The identification of the party participating in the energy market business processes.

461 Table 7 shows all attributes of MarketParticipant.

463 **Table 7 - Attributes of Acknowledgement contextual model::MarketParticipant**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	mRID PartyID_String	The identification of a party in the energy market.

464

465 Table 8 shows all association ends of MarketParticipant with other classes.

466 **Table 8 - Association ends of Acknowledgement contextual model::MarketParticipant**
467 **with other classes**

Order	mult.	Class name / Role	Description
1	[1..1]	MarketRole MarketRole	The role associated with a MarketParticipant. Association Based On: ESMPClasses::MarketParticipant.[] ----- ESMPClasses::MarketRole.MarketRole[0..1]

468

469 **6.1.3.3 MarketRole**

470 The identification of the intended behaviour of a market participant played within a given
471 business process.

472 Table 9 shows all attributes of MarketRole.

473 **Table 9 - Attributes of Acknowledgement contextual model::MarketRole**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	type MarketRoleKind_String	The identification of the role played by a market player.

474

475 **6.1.3.4 Process**

476 The formal identification of the business process in which a flow of information is exchanged.

477 Table 10 shows all attributes of Process.

478 **Table 10 - Attributes of Acknowledgement contextual model::Process**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	processType ProcessKind_String	The identification of the nature of process that the document addresses.

479

480 **6.1.3.5 Reason**

481 The motivation of an act.

482 Table 11 shows all attributes of Reason.

483

Table 11 - Attributes of Acknowledgement contextual model::Reason

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	code ReasonCode_String	The motivation of an act in coded form.
1	[0..1]	text ReasonText_String	The textual explanation corresponding to the reason code.

484

6.1.3.6 Received_MarketDocument

486 The identification of the electronic document that has been received and which is the object of
487 this acknowledgement.

488 Table 12 shows all attributes of Received_MarketDocument.

489

Table 12 - Attributes of Acknowledgement contextual model::Received_MarketDocument

490

Order	mult.	Attribute name / Attribute type	Description
0	[0..1]	mRID ID_String	The unique identification of the document being exchanged within a business process flow.
1	[0..1]	revisionNumber ESMPVersion_String	The identification of the version that distinguishes one evolution of a document from another.
2	[0..1]	type MessageKind_String	The coded type of a document. The document type describes the principal characteristic of the document.
4	[0..1]	title PayloadId_String	The identification of the name of the file or the payload that has been transmitted.
5	[0..1]	createdDateTime ESMP_DateTime	The date and time of the creation of the document.

491

492 Table 13 shows all association ends of Received_MarketDocument with other classes.

493

Table 13 - Association ends of Acknowledgement contextual model::Received_MarketDocument with other classes

494

Order	mult.	Class name / Role	Description
3	[0..1]	Process Process	Association Based On: ESMPClasses::MarketDocument.[] ----- ESMPClasses::Process.Process[0..*]

495

6.1.3.7 Receiver_MarketParticipant

497 The identification of the party participating in the energy market business processes.

498 Table 14 shows all attributes of Receiver_MarketParticipant.

499
500

Table 14 - Attributes of Acknowledgement contextual model::Receiver_MarketParticipant

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	mRID PartyID_String	The identification of a party in the energy market.

501

502 Table 15 shows all association ends of Receiver_MarketParticipant with other classes.

503
504

Table 15 - Association ends of Acknowledgement contextual model::Receiver_MarketParticipant with other classes

Order	mult.	Class name / Role	Description
1	[0..1]	MarketRole MarketRole	The role associated with a MarketParticipant. Association Based On: ESMPClasses::MarketParticipant.[] ----- ESMPClasses::MarketRole.MarketRole[0..1]

505

506 **6.1.3.8 Time_Period**

507 The identification of a time interval with errors. It should be noted that the relative position
508 transmit in the original document will have been converted to an absolute time interval
509 whenever errors occur at this level in the acknowledgement document.

510 Table 16 shows all attributes of Time_Period.

511 **Table 16 - Attributes of Acknowledgement contextual model::Time_Period**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	timeInterval ESMP_DateTimeInterval	The start and end date and time for a given interval.

512

513 Table 17 shows all association ends of Time_Period with other classes.

514 **Table 17 - Association ends of Acknowledgement contextual model::Time_Period with**
515 **other classes**

Order	mult.	Class name / Role	Description
1	[1..*]	Reason Reason	If there are errors at the Time_Period level as many Reason elements as necessary may be used. The reason information associated with a Time_Period providing motivation information. Association Based On: ESMPClasses::Time_Period.[] ----- ESMPClasses::Reason.Reason[0..*]

516

517 **6.1.3.9 TimeSeries**

518 The TimeSeries stated as being in error.

519 A set of time-ordered quantities being exchanged in relation to a product.

520 Table 18 shows all attributes of TimeSeries.

521 **Table 18 - Attributes of Acknowledgement contextual model::TimeSeries**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	mRID ID_String	A unique identification of the time series.
1	[0..1]	version ESMPVersion_String	The identification of the version of the time series.

522

523 Table 19 shows all association ends of TimeSeries with other classes.

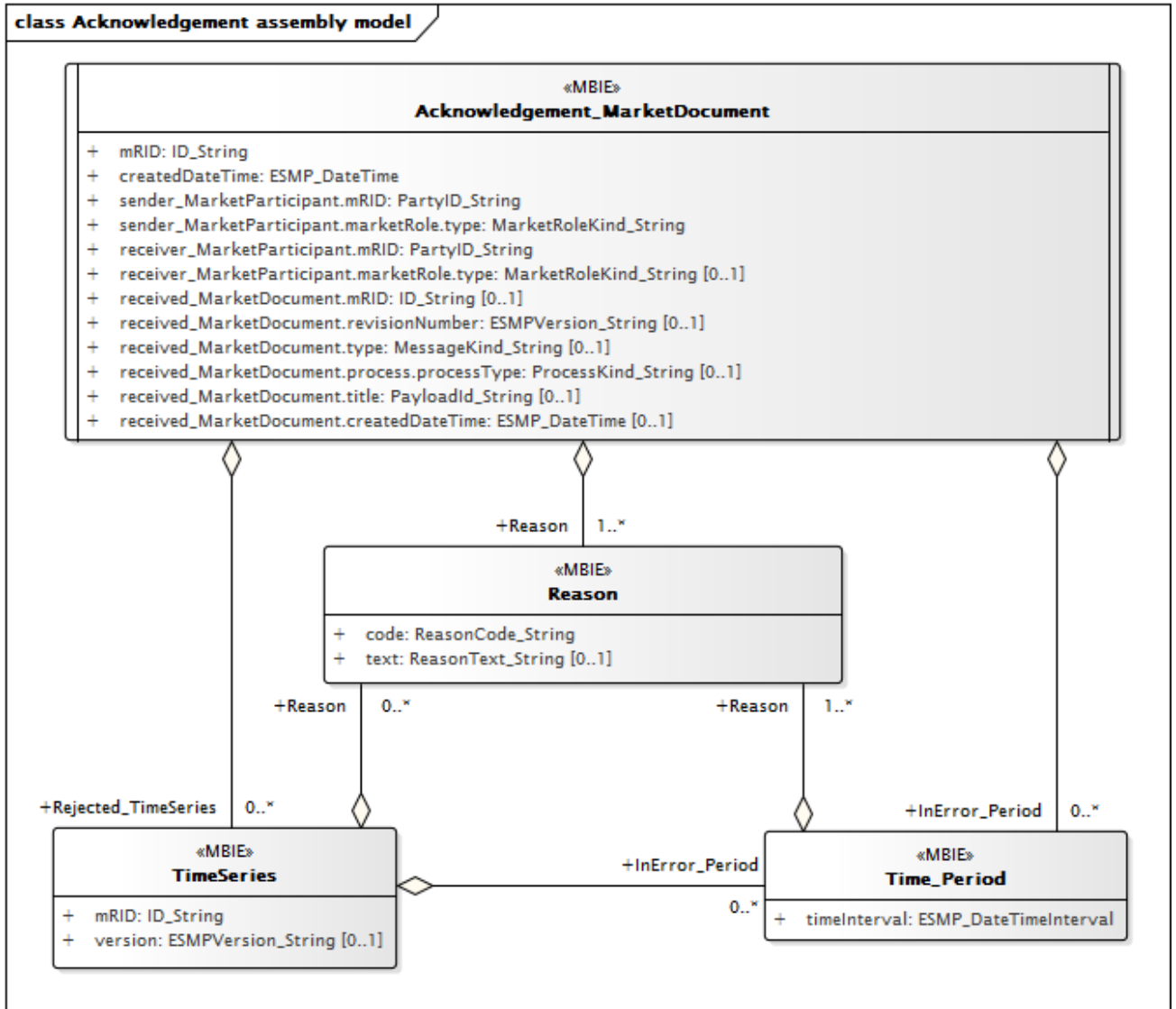
524 **Table 19 - Association ends of Acknowledgement contextual model::TimeSeries with**
525 **other classes**

Order	mult.	Class name / Role	Description
2	[0..*]	Time_Period InError_Period	The time interval in a TimeSeries that is in error. Association Based On: ESMPClasses::TimeSeries.[] ----- ESMPClasses::Time_Period.Period[0..*]
3	[0..*]	Reason Reason	If there are errors at the TimeSeries level as many Reason elements as necessary may be found at that level. The reason information associated with a TimeSeries providing motivation information. Association Based On: ESMPClasses::TimeSeries.[] ----- ESMPClasses::Reason.Reason[0..*]

526

527 **6.2 Acknowledgement assembly model**528 **6.2.1 Overview of the model**

529 Figure 5 shows the model.



530

531

Figure 5 - Acknowledgement assembly model

532

6.2.2 IsBasedOn relationships from the European style market profile

533

Table 20 shows the traceability dependency of the classes used in this package towards the upper level.

534

535

Table 20 - IsBasedOn dependency

Name	Complete IsBasedOn Path
Acknowledgement_MarketDocument	TC57CIM::IEC62325::MarketManagement::MarketDocument
Reason	TC57CIM::IEC62325::MarketManagement::Reason
Time_Period	TC57CIM::IEC62325::MarketManagement::Period
TimeSeries	TC57CIM::IEC62325::MarketManagement::TimeSeries

536

537 **6.2.3 Detailed Acknowledgement assembly model**538 **6.2.3.1 Acknowledgement_MarketDocument root class**539 An electronic document that is used to acknowledge the reception of a document and to
540 provide information concerning its basic validity.

541 Table 21 shows all attributes of Acknowledgement_MarketDocument.

542 **Table 21 - Attributes of Acknowledgement assembly**
543 **model::Acknowledgement_MarketDocument**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	mRID ID_String	The unique identification of the document being exchanged within a business process flow.
1	[1..1]	createdDateTime ESMP_DateTime	The date and time of the creation of the document.
2	[1..1]	sender_MarketParticipant.mRID PartyID_String	The identification of a party in the energy market. --- The identification of the party that is the originator of the acknowledgement. The originator of the acknowledgement is identified by a unique coded identification. This value should be the same as that found in the receiver identification of the document being acknowledged. The MarketParticipant that transmits the electronic document.
3	[1..1]	sender_MarketParticipant.marketRole.type MarketRoleKind_String	The identification of the role played by a market player. --- The identification of the party that is the originator of the acknowledgement. The originator of the acknowledgement is identified by a unique coded identification. This value should be the same as that found in the receiver identification of the document being acknowledged. The MarketParticipant that transmits the electronic document. --- The role associated with a MarketParticipant.
4	[1..1]	receiver_MarketParticipant.mRID PartyID_String	The identification of a party in the energy market. --- The identification of the party who is the recipient of the acknowledgement. The recipient of the document is identified by a unique coded identification. This value should be the same as that found in the sender identification of the document being acknowledged. The MarketParticipant that receives the electronic document.
5	[0..1]	receiver_MarketParticipant.marketRole.type MarketRoleKind_String	The identification of the role played by a market player. --- The identification of the party who is the recipient of the acknowledgement. The recipient of the document is identified by a unique coded identification. This value should be the same as that found in the sender identification of the document being acknowledged. The MarketParticipant that receives the electronic document. --- The role associated with a MarketParticipant.
6	[0..1]	received_MarketDocument.mRID ID_String	The unique identification of the document being exchanged within a business process flow. --- This information identifies the document that has been received. The information is extracted from the received document.

Order	mult.	Attribute name / Attribute type	Description
7	[0..1]	received_MarketDocument.revisionNumber ESMPVersion_String	The identification of the version that distinguishes one evolution of a document from another. --- This information identifies the document that has been received. The information is extracted from the received document.
8	[0..1]	received_MarketDocument.type MessageKind_String	The coded type of a document. The document type describes the principal characteristic of the document. --- This information identifies the document that has been received. The information is extracted from the received document.
9	[0..1]	received_MarketDocument.process.processType ProcessKind_String	The identification of the nature of process that the document addresses. --- This information identifies the document that has been received. The information is extracted from the received document.
10	[0..1]	received_MarketDocument.title PayloadId_String	The identification of the name of the file or the payload that has been transmitted. --- This information identifies the document that has been received. The information is extracted from the received document.
11	[0..1]	received_MarketDocument.createdDateTime ESMP_DateTime	The date and time of the creation of the document. --- This information identifies the document that has been received. The information is extracted from the received document.

544

545 Table 22 shows all association ends of Acknowledgement_MarketDocument with other
546 classes.

547

548

Table 22 - Association ends of Acknowledgement assembly model::Acknowledgement_MarketDocument with other classes

Order	mult.	Class name / Role	Description
12	[0..*]	TimeSeries Rejected_TimeSeries	The time series in the received document that has been rejected during the initial validation process. Association Based On: Acknowledgement contextual model::Acknowledgement_MarketDocument.[] ----- Acknowledgement contextual model::TimeSeries.Rejected_TimeSeries[0..*]
13	[1..*]	Reason Reason	In case of a received document without error, only one Reason element is necessary to acknowledge it. However, if there are errors then there may be as many Reason elements as are necessary to describe any errors discovered in the received document. At least one reason element must appear associated with the header part of the document. The Reason associated with the electronic document header providing different motivations for the creation of the document. Association Based On: Acknowledgement contextual model::Acknowledgement_MarketDocument.[] ----- Acknowledgement contextual model::Reason.Reason[1..*]
14	[0..*]	Time_Period InError_Period	The time interval that is associated with the received document and which contains error. Association Based On: Acknowledgement contextual model::Acknowledgement_MarketDocument.[] ----- Acknowledgement contextual model::Time_Period.InError_Period[0..*]

549

550 **6.2.3.2 Reason**

551 The motivation of an act.

552 Table 23 shows all attributes of Reason.

553 **Table 23 - Attributes of Acknowledgement assembly model::Reason**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	code ReasonCode_String	The motivation of an act in coded form.
1	[0..1]	text ReasonText_String	The textual explanation corresponding to the reason code.

554

555 6.2.3.3 Time_Period

556 The identification of a time interval with errors. It should be noted that the relative position
557 transmit in the original document will have been converted to an absolute time interval
558 whenever errors occur at this level in the acknowledgement document.

559 Table 24 shows all attributes of Time_Period.

560 **Table 24 - Attributes of Acknowledgement assembly model::Time_Period**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	timeInterval ESMP_DateTimeInterval	The start and end date and time for a given interval.

561

562 Table 25 shows all association ends of Time_Period with other classes.

563 **Table 25 - Association ends of Acknowledgement assembly model::Time_Period with**
564 **other classes**

Order	mult.	Class name / Role	Description
1	[1..*]	Reason Reason	If there are errors at the Time_Period level as many Reason elements as necessary may be used. The reason information associated with a Time_Period providing motivation information. Association Based On: Acknowledgement contextual model::Time_Period.[] ----- Acknowledgement contextual model::Reason.Reason[1..*]

565

566 6.2.3.4 TimeSeries

567 The TimeSeries stated as being in error.

568 A set of time-ordered quantities being exchanged in relation to a product.

569 Table 26 shows all attributes of TimeSeries.

570

Table 26 - Attributes of Acknowledgement assembly model::TimeSeries

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	mRID ID_String	A unique identification of the time series.
1	[0..1]	version ESMPVersion_String	The identification of the version of the time series.

571

572 Table 27 shows all association ends of TimeSeries with other classes.

573

Table 27 - Association ends of Acknowledgement assembly model::TimeSeries with other classes

574

Order	mult.	Class name / Role	Description
2	[0..*]	Time_Period InError_Period	The time interval in a TimeSeries that is in error. Association Based On: Acknowledgement contextual model::TimeSeries.[] ----- Acknowledgement contextual model::Time_Period.InError_Period[0..*]
3	[0..*]	Reason Reason	If there are errors at the TimeSeries level as many Reason elements as necessary may be found at that level. The reason information associated with a TimeSeries providing motivation information. Association Based On: Acknowledgement contextual model::TimeSeries.[] ----- Acknowledgement contextual model::Reason.Reason[0..*]

575

576 **6.2.4 Primitives**

577 **6.2.4.1 String primitive**

578 A string consisting of a sequence of 8 bit characters. The character encoding is UTF-8. The
579 string length is unspecified and unlimited.

580 **6.2.4.2 DateTime primitive**

581 Date and time as "YYYY-MM-DDThh:mm:ss.sssZ", which conforms with the ISO 8601 UTC
582 time zone

583 **Note:** the time within ESMP is expressed in UTC.

584 **6.2.5 Datatypes**

585 **6.2.5.1 ESMP_DateTimeInterval compound**

586 This datatype enables to express the start date and time, and the end date and time of a time
587 interval with a specific pattern. This pattern is the YYYY-MM-DDThh:mmZ.

588 Table 28 shows all attributes of ESMP_DateTimeInterval.

589

Table 28 - Attributes of ESMPDataTypes::ESMP_DateTimeInterval

mult.	Attribute name / Attribute type	Description
[1..1]	start YMDHM_DateTime	The start date and time of the interval with a minute resolution.
[1..1]	end YMDHM_DateTime	The end date and time of the interval with a minute resolution.

590

6.2.5.2 ESMP_DateTime datatype

592 In ESMP, the dateTime shall be expressed in UTC as YYYY-MM-DDThh:mm:ssZ.

593 Table 29 shows all attributes of ESMP_DateTime.

594

Table 29 - Attributes of ESMPDataTypes::ESMP_DateTime

mult.	Attribute name / Attribute type	Description
[1..1]	value DateTime	Main Core value Space.

595

596 Table 30 shows all restrictions applied to the attributes of ESMP_DateTime.

597

Table 30 - Restrictions of attributes for ESMPDataTypes::ESMP_DateTime

Name	Constraint	Type	Expression of constraint
value	pattern	OCL	inv: self->Pattern((((([0-9]{4})[\\-])(0[13578] 1[02])[\\-](0[1-9] [12][0-9] 3[01]))([0-9]{4})[\\-]([0[469]) (11)[\\-](0[1-9] [12][0-9] 30))T(((01)[0-9] 2[0-3]):[0-5][0-9]:[0-5][0-9])Z) ((13579 [26][02468][048] 13579 [01345789](0)[48] 13579 [01345789][2468][048] 02468][048][02468][048] 1235679)(0)[48] 02468 [1235679][2468][048] 0-9][0-9][13579][26])[\\-](02)[\\-](0[1-9] 1[0-9] 2[0-9])T(((01)[0-9] 2[0-3]):[0-5][0-9]:[0-5][0-9])Z) ((13579 [26][02468][1235679] 13579 [01345789](0)[01235679] 13579 [01345789][2468][1235679] 02468][048][02468][1235679] 02468 [1235679](0)[01235679] 02468 [1235679][2468][1235679] 0-9][0-9][13579 [01345789])[\\-](02)[\\-](0[1-9] 1[0-9] 2[0-8])T(((01)[0-9] 2[0-3]):[0-5][0-9]:[0-5][0-9])Z))

598

6.2.5.3 ESMPVersion_String datatype

600 In ESMP, the coded value is restricted to digits.

601 A code that distinguishes one evolution of an identified object from another. Information about
602 a specific object may be sent several times, each transmission being identified by a different
603 version number.

604 Table 31 shows all attributes of ESMPVersion_String.

605

Table 31 - Attributes of ESMPDataTypes::ESMPVersion_String

mult.	Attribute name / Attribute type	Description
[1..1]	value String	Main Core value Space.

606

607 Table 32 shows all restrictions applied to the attributes of ESMPVersion_String.

608 **Table 32 - Restrictions of attributes for ESMPDataTypes::ESMPVersion_String**

Name	Constraint	Type	Expression of constraint
value	pattern	OCL	inv: self->Pattern([1-9]([0-9]){0,2})

609

610 **6.2.5.4 ID_String datatype**

611 A code to uniquely distinguish one occurrence of an entity from another.

612 In the ESMP context, the code is defined either by:

613 - an emitting company that provides an agreed identification unique within a business context
 614 such as capacity auction identification, market agreement identification, etc.

615 - a party (originator of the exchange) that provides a unique identification in the framework of
 616 a business exchange such as document identification, time series identification, bid
 617 identification, ...

618 Table 33 shows all attributes of ID_String.

619 **Table 33 - Attributes of ESMPDataTypes::ID_String**

mult.	Attribute name / Attribute type	Description
[1..1]	value String	Main Core value Space.

620

621 Table 34 shows all restrictions applied to the attributes of ID_String.

622 **Table 34 - Restrictions of attributes for ESMPDataTypes::ID_String**

Name	Constraint	Type	Expression of constraint
value	maxLength	OCL	inv: self->MaxLength(35)

623

624 **6.2.5.5 MarketRoleKind_String datatype**

625 The identification of the role played by a party.

626 Table 35 shows all attributes of MarketRoleKind_String.

627 **Table 35 - Attributes of ESMPDataTypes::MarketRoleKind_String**

mult.	Attribute name / Attribute type	Description
[1..1]	value RoleTypeList	Main Core value Space.

628

629 **6.2.5.6 MessageKind_String datatype**

630 The coded type of a document.

631 Table 36 shows all attributes of MessageKind_String.

632 **Table 36 - Attributes of ESMPDataTypes::MessageKind_String**

mult.	Attribute name / Attribute type	Description
[1..1]	value MessageTypeList	Main Core value Space.

633

634 **6.2.5.7 PartyID_String datatype**

635 The identification of an actor in the energy market.

636 In the ESMP context, it is an authorized issuing office that provides an agreed identification
637 coding scheme for market participant identification.

638 Table 37 shows all attributes of PartyID_String.

639 **Table 37 - Attributes of ESMPDataTypes::PartyID_String**

mult.	Attribute name / Attribute type	Description
[1..1]	codingScheme CodingSchemeTypeList	DomainQualification.
[1..1]	value String	Main Core value Space.

640

641 Table 38 shows all restrictions applied to the attributes of PartyID_String.

642 **Table 38 - Restrictions of attributes for ESMPDataTypes::PartyID_String**

Name	Constraint	Type	Expression of constraint
value	maxLength	OCL	inv: self->MaxLength(16)

643

644 **6.2.5.8 PayloadId_String datatype**

645 The name of a file or the payload identification.

646 Table 39 shows all attributes of PayloadId_String.

647

Table 39 - Attributes of ESMPDataTypes::PayloadId_String

mult.	Attribute name / Attribute type	Description
[1..1]	value String	Main Core value Space.

648

649 Table 40 shows all restrictions applied to the attributes of PayloadId_String.

650

Table 40 - Restrictions of attributes for ESMPDataTypes::PayloadId_String

Name	Constraint	Type	Expression of constraint
value	maxLength	OCL	inv: self->MaxLength(150)

651

652 **6.2.5.9 ProcessKind_String datatype**

653 The coded identification of the nature of process.

654 Table 41 shows all attributes of ProcessKind_String.

655

Table 41 - Attributes of ESMPDataTypes::ProcessKind_String

mult.	Attribute name / Attribute type	Description
[1..1]	value ProcessTypeList	Main Core value Space.

656

657 **6.2.5.10 ReasonCode_String datatype**

658 The coded motivation of an act.

659 Table 42 shows all attributes of ReasonCode_String.

660

Table 42 - Attributes of ESMPDataTypes::ReasonCode_String

mult.	Attribute name / Attribute type	Description
[1..1]	value ReasonCodeTypeList	Main Core value Space.

661

662 **6.2.5.11 ReasonText_String datatype**

663 The textual explanation of an act as a string of characters.

664 Table 43 shows all attributes of ReasonText_String.

665

Table 43 - Attributes of ESMPDataTypes::ReasonText_String

mult.	Attribute name / Attribute type	Description
[1..1]	value String	Main Core value Space.

666

667 Table 44 shows all restrictions applied to the attributes of ReasonText_String.

668

Table 44 - Restrictions of attributes for ESMPDataTypes::ReasonText_String

Name	Constraint	Type	Expression of constraint
value	maxLength	OCL	inv: self->MaxLength(512)

669

670 **6.2.5.12 YMDHM_DateTime datatype**671 In ESMP, the date and time expressed as "YYYY-MM-DDThh:mmZ", which conforms with the
672 ISO 8601 UTC time zone. This date and time is without the seconds.

673 Table 45 shows all attributes of YMDHM_DateTime.

674

Table 45 - Attributes of ESMPDataTypes::YMDHM_DateTime

mult.	Attribute name / Attribute type	Description
[1..1]	value DateTime	The date and time as "YYYY-MM-DDThh:mmZ", which conforms with the ISO 8601 UTC time zone.

675

676 Table 46 shows all restrictions applied to the attributes of YMDHM_DateTime.

677

Table 46 - Restrictions of attributes for ESMPDataTypes::YMDHM_DateTime

Name	Constraint	Type	Expression of constraint
value	pattern	OCL	inv: self->Pattern((((([0-9]{4})[\-](0[13578] 1[02])[\-](0[1-9] [12][0-9] 3[01]) ([0-9]{4})[\-]([0[469]) (11))[\-](0[1-9] [12][0-9] 30))T((([01][0-9] 2[0-3]):[0-5][0-9])Z) (((13579 [26][02468][048]) 13579 [01345789](0)[48]) 13579 [01345789][2468][048] 02468 [048][02468][048] 02468 [1235679](0)[48] 02468 [1235679][2468][048] 0[9][0-9][13579][26])[\-](02)[\-](0[1-9] 1[0-9] 2[0-9])T((([01][0-9] 2[0-3]):[0-5][0-9])Z) (((13579 [26][02468][1235679]) 13579 [01345789](0)[01235679]) 13579 [01345789][2468][1235679] 02468 [048][02468][1235679] 1235679 [02468][1235679](0)[01235679] 02468 [1235679][2468][1235679] 0[9][0-9][13579][01345789])[\-](02)[\-](0[1-9] 1[0-9] 2[0-8])T((([01][0-9] 2[0-3]):[0-5][0-9])Z))
value	TruncationOrReduced	INV	choice=gYearMonthDayHourMinute

678

679 **6.2.6 Enumerations**

680 The list of enumerations used for the Acknowledgement assembly model is as follows:

- 681 • CodingSchemeTypeList
- 682 • MessageTypeList
- 683 • ProcessTypeList

- 684 • ReasonCodeTypeList
- 685 • RoleTypeList

686 7 XML schema

687 7.1 XML schema URN namespace rules

688 In order to provide a generic and stable means of declaring a URN for the European style
689 market profile XML schemas, the namespace will be composed in the following manner:

690 **urn:iec62325.351:tc57wg16:<process>:<document>:<version>:<release>**

691 where:

- 692 • iec62325.351 shall be the stem of all European style market profile XML schema
693 namespaces.
- 694 • tc57wg16 identifies the organisation or group of organisations within IEC that own the
695 object being referenced. In the case of TC57 this shall be the WG16.
- 696 • <process> identifies the specific process where the object is situated, e.g. the part of the
697 IEC 62325 standards in which the XML schema is defined, e.g. 451-1, 451-2, 451-3, etc.
- 698 • <document> identifies the electronic document schema.
- 699 • <version> identifies the version of the document schema.
- 700 • <release> identifies the release of the document schema.

701 Every XML schema representing an electronic document shall have a default namespace
702 corresponding to the namespace that identifies the document and respects the above URI
703 namespace construction.

704 Every XML schema representing an electronic document shall have a targetNamespace
705 corresponding to the default namespace.

706 Every XML schema shall have an elementFormDefault as “qualified”.

707 Every XML schema shall have an attributeFormDefault as “unqualified”.

708 7.2 Code list URN namespace rules

709 In the case of the codelist library that shall be used for the European style market profile the
710 URN shall be as follows **urn:entsoe.eu:wgedi:codelists**.

711 7.3 URI rules for model documentation

712 7.3.1 Datatype

713 All the datatypes are documented in IEC 62325-351.

714 In the case of the base datatype library that shall be used for the European style market
715 profile, the URI shall use the sawsdl:modelReference as follows:

716 **http://iec.ch/TC57/<CIM-version-year>/CIM-schema-<cimxx>#[datatype-name]**

717 where:

- 718 • <CIM-version-year> is the year of the released CIM version used for generating market
719 profile.
- 720 • <cimxx> is the CIM version name.

721 • [datatype-name] is the name of the CIM datatype or primitive.

722 Examples:

723 <http://iec.ch/TC57/2012/CIM-schema-cim16#String>

724 <http://iec.ch/TC57/2012/CIM-schema-cim16#Money>

725 **7.3.2 Class**

726 In the case of the base class library that shall be used for the European style market profile,
727 the URI shall use the sawsdl:modelReference as follows:

728 **[http://iec.ch/TC57/<CIM-version-year>/CIM-schema-<cimxx>#\[class-name\]](http://iec.ch/TC57/<CIM-version-year>/CIM-schema-<cimxx>#[class-name])**

729 where:

730 • <CIM-version-year> is the year of the released CIM version used for generating market
731 profile

732 • <cimxx> is the CIM version name

733 • [class-name] is the name of the CIM class

734 Example: <http://iec.ch/TC57/2012/CIM-schema-cim16#TimeSeries>

735 **7.3.3 Attribute**

736 In the case of the base attribute library that shall be used for the European style market
737 profile, the URI shall use the sawsdl:modelReference as follows:

738 **[http://iec.ch/TC57/<CIM-version-year>/CIM-schema-<cimxx>#\[class-name\].\[attribute-
name\]](http://iec.ch/TC57/<CIM-version-year>/CIM-schema-<cimxx>#[class-name].[attribute-
739 name])**

740 where:

741 • <CIM-version-year> is the year of the released CIM version used for generating market
742 profile

743 • <cimxx> is the CIM version name

744 • [class-name] is the name of the CIM class

745 • [attribute-name] is the name of a class attribute

746 Example: <http://iec.ch/TC57/2012/CIM-schema-cim16#TimeSeries.product>

747 **7.3.4 Association end role name**

748 In the case of the base association library that shall be used for the European style market
749 profile, the URI shall use the sawsdl:modelReference as follows:

750 **[http://iec.ch/TC57/<CIM-version-year>/CIM-schema-<cimxx>#\[class-name\].\[association-
end-role-name\]](http://iec.ch/TC57/<CIM-version-year>/CIM-schema-<cimxx>#[class-name].[association-
751 end-role-name])**

752 where:

753 • <CIM-version-year> is the year of the released CIM version used for generating market
754 profile

755 • <cimxx> is the CIM version name

756 • [class-name] is the name of the CIM class

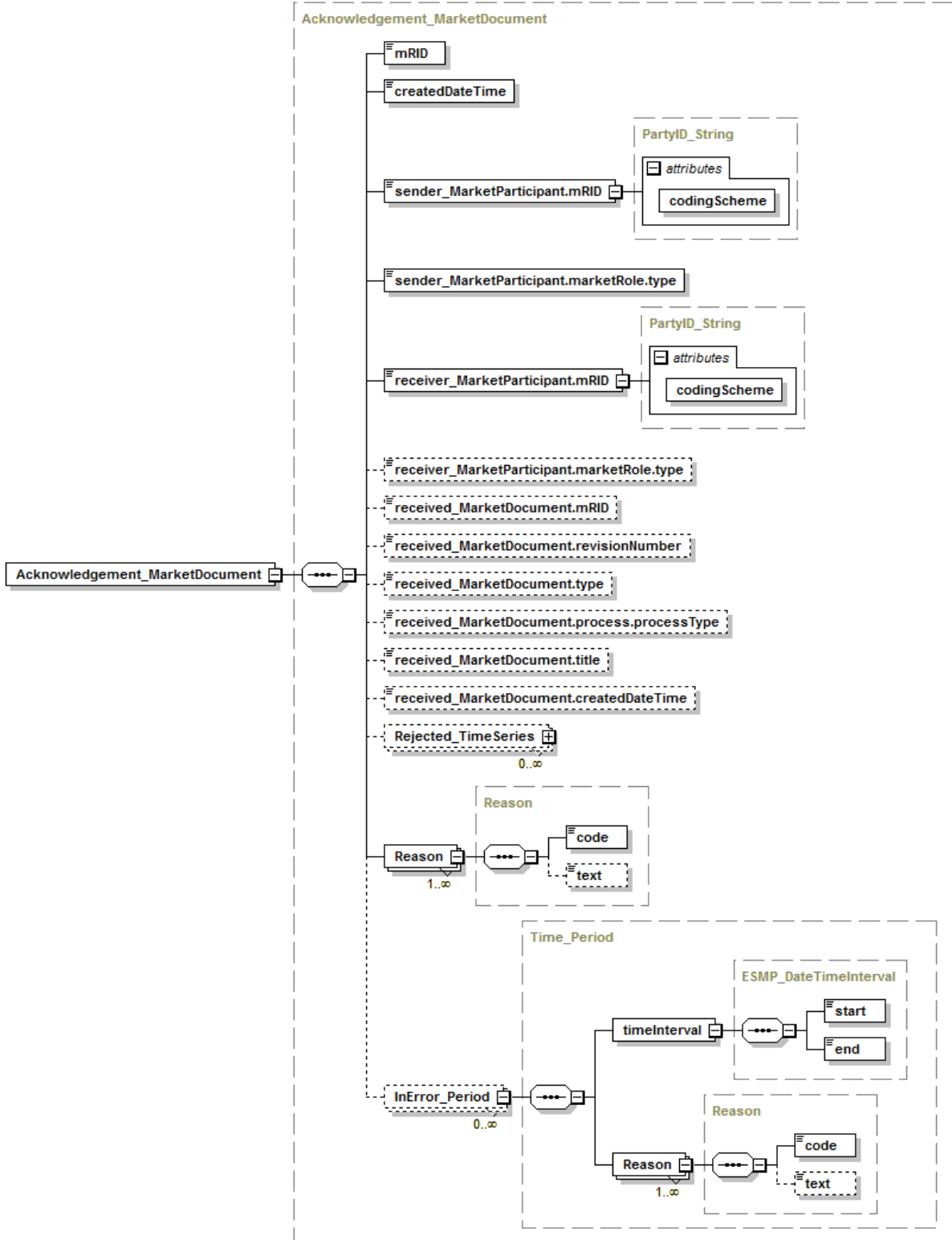
757 • [association-end-role-name]

758 Example: <http://iec.ch/TC57/2012/CIM-schema-cim16#MarketDocument.TimeSeries>

759 7.4 Acknowledgement_MarketDocument schema

760 7.4.1 Schema Structure

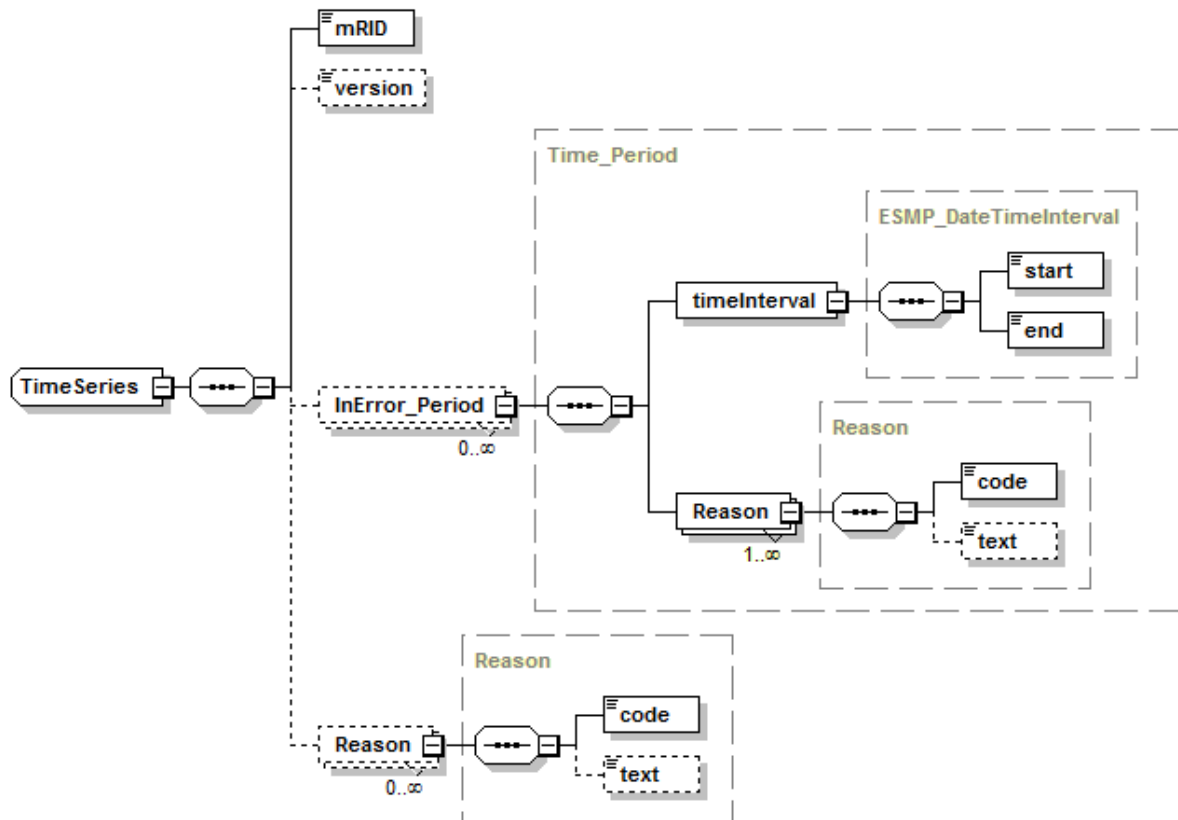
761 Figure 6 and Figure 7 provide the structure of the schema.



762

763

Figure 6 – Acknowledgement_MarketDocument XML schema structure – 1/2



764

765 **Figure 7 – Acknowledgement_MarketDocument XML schema structure – 2/2**766 **7.4.2 Schema description**

```

767 <?xml version="1.0" encoding="utf-8"?>
768 <xs:schema xmlns:cl="urn:entsoe.eu:wgedi:codelists"
769 xmlns:sawsdl="http://www.w3.org/ns/sawsdl" xmlns="urn:iec62325.351:tc57wg16:451-
770 1:acknowledgementdocument:8:0" xmlns:cimp="http://www.iec.ch/cimprofile"
771 attributeFormDefault="unqualified" elementFormDefault="qualified"
772 targetNamespace="urn:iec62325.351:tc57wg16:451-1:acknowledgementdocument:8:0"
773 xmlns:xs="http://www.w3.org/2001/XMLSchema">
774 <xs:import schemaLocation="urn-entsoe-eu-wgedi-codelists.xsd"
775 namespace="urn:entsoe.eu:wgedi:codelists" />
776 <xs:element name="Acknowledgement_MarketDocument"
777 type="Acknowledgement_MarketDocument" />
778 <xs:simpleType name="ID_String" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
779 schema-cim16#String">
780 <xs:restriction base="xs:string">
781 <xs:maxLength value="35" />
782 </xs:restriction>
783 </xs:simpleType>
784 <xs:simpleType name="ESMP_DateTime"
785 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#DateTime">
786 <xs:restriction base="xs:dateTime">
787 <xs:pattern value="((( [0-9]{4} ) [ \- ] ( 0 [13578] | 1 [02] ) [ \- ] ( 0 [1-9] | [12] [0-
788 9] | 3 [01] ) | ( [0-9]{4} ) [ \- ] ( ( 0 [469] ) | ( 11 ) ) [ \- ] ( 0 [1-9] | [12] [0-9] | 30 ) ) T ( ( [01] [0-9] | 2 [0-
789 3] ) : [0-5] [0-9] : [0-5] [0-
790 9] ) Z ) | ( ( [13579] [26] [02468] [048] | [13579] [01345789] ( 0 ) [48] | [13579] [01345789] [2468] [048]
791 | [02468] [048] [02468] [048] | [02468] [1235679] ( 0 ) [48] | [02468] [1235679] [2468] [048] | [0-
792 9] [0-9] [13579] [26] ) [ \- ] ( 02 ) [ \- ] ( 0 [1-9] | 1 [0-9] | 2 [0-9] ) ) T ( ( [01] [0-9] | 2 [0-3] ) : [0-5] [0-
793 9] : [0-5] [0-
794 9] ) Z ) | ( ( [13579] [26] [02468] [1235679] | [13579] [01345789] ( 0 ) [01235679] | [13579] [01345789] [
795 2468] [1235679] | [02468] [048] [02468] [1235679] | [02468] [1235679] ( 0 ) [01235679] | [02468] [123
796 5679] [2468] [1235679] | [0-9] [0-9] [13579] [01345789] ) [ \- ] ( 02 ) [ \- ] ( 0 [1-9] | 1 [0-9] | 2 [0-
797 8] ) ) T ( ( [01] [0-9] | 2 [0-3] ) : [0-5] [0-9] : [0-5] [0-9] ) Z ) " />
798 </xs:restriction>
799 </xs:simpleType>

```

```

800     <xs:simpleType name="PartyID_String-base"
801 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
802     <xs:restriction base="xs:string">
803     <xs:maxLength value="16" />
804     </xs:restriction>
805     </xs:simpleType>
806     <xs:complexType name="PartyID_String"
807 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
808     <xs:simpleContent>
809     <xs:extension base="PartyID_String-base">
810     <xs:attribute name="codingScheme" type="cl:CodingSchemeTypeList"
811 use="required" />
812     </xs:extension>
813     </xs:simpleContent>
814     </xs:complexType>
815     <xs:simpleType name="MarketRoleKind_String"
816 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
817     <xs:restriction base="cl:RoleTypeList" />
818     </xs:simpleType>
819     <xs:simpleType name="ESMPVersion_String"
820 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
821     <xs:restriction base="xs:string">
822     <xs:pattern value="[1-9]([0-9]){0,2}" />
823     </xs:restriction>
824     </xs:simpleType>
825     <xs:simpleType name="MessageKind_String"
826 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
827     <xs:restriction base="cl:MessageTypeList" />
828     </xs:simpleType>
829     <xs:simpleType name="ProcessKind_String"
830 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
831     <xs:restriction base="cl:ProcessTypeList" />
832     </xs:simpleType>
833     <xs:simpleType name="PayloadId_String"
834 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
835     <xs:restriction base="xs:string">
836     <xs:maxLength value="150" />
837     </xs:restriction>
838     </xs:simpleType>
839     <xs:complexType name="Acknowledgement_MarketDocument"
840 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#MarketDocument">
841     <xs:sequence>
842     <xs:element minOccurs="1" maxOccurs="1" name="mRID" type="ID_String"
843 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
844 cim16#IdentifiedObject.mRID">
845     </xs:element>
846     <xs:element minOccurs="1" maxOccurs="1" name="createdDateTime"
847 type="ESMP_DateTime" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
848 cim16#Document.createdDateTime">
849     </xs:element>
850     <xs:element minOccurs="1" maxOccurs="1" name="sender_MarketParticipant.mRID"
851 type="PartyID_String" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
852 cim16#IdentifiedObject.mRID">
853     </xs:element>
854     <xs:element minOccurs="1" maxOccurs="1"
855 name="sender_MarketParticipant.marketRole.type" type="MarketRoleKind_String"
856 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#MarketRole.type">
857     </xs:element>
858     <xs:element minOccurs="1" maxOccurs="1" name="receiver_MarketParticipant.mRID"
859 type="PartyID_String" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
860 cim16#IdentifiedObject.mRID">
861     </xs:element>
862     <xs:element minOccurs="0" maxOccurs="1"
863 name="receiver_MarketParticipant.marketRole.type" type="MarketRoleKind_String"
864 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#MarketRole.type">
865     </xs:element>
866     <xs:element minOccurs="0" maxOccurs="1" name="received_MarketDocument.mRID"
867 type="ID_String" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
868 cim16#IdentifiedObject.mRID">
869     </xs:element>

```

```

870     <xs:element minOccurs="0" maxOccurs="1"
871 name="received_MarketDocument.revisionNumber" type="ESMPVersion_String"
872 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
873 cim16#Document.revisionNumber">
874     </xs:element>
875     <xs:element minOccurs="0" maxOccurs="1" name="received_MarketDocument.type"
876 type="MessageKind_String" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
877 cim16#Document.type">
878     </xs:element>
879     <xs:element minOccurs="0" maxOccurs="1"
880 name="received_MarketDocument.process.processType" type="ProcessKind_String"
881 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Process.processType">
882     </xs:element>
883     <xs:element minOccurs="0" maxOccurs="1" name="received_MarketDocument.title"
884 type="PayloadId_String" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
885 cim16#Document.title">
886     </xs:element>
887     <xs:element minOccurs="0" maxOccurs="1"
888 name="received_MarketDocument.createdDateTime" type="ESMP_DateTime"
889 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
890 cim16#Document.createdDateTime">
891     </xs:element>
892     <xs:element minOccurs="0" maxOccurs="unbounded" name="Rejected_TimeSeries"
893 type="TimeSeries" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
894 cim16#MarketDocument.Rejected_TimeSeries">
895     </xs:element>
896     <xs:element minOccurs="1" maxOccurs="unbounded" name="Reason" type="Reason"
897 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
898 cim16#MarketDocument.Reason">
899     </xs:element>
900     <xs:element minOccurs="0" maxOccurs="unbounded" name="InError_Period"
901 type="Time_Period" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
902 cim16#MarketDocument.InError_Period">
903     </xs:element>
904 </xs:sequence>
905 </xs:complexType>
906 <xs:simpleType name="ReasonCode_String"
907 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
908     <xs:restriction base="cl:ReasonCodeTypeList" />
909 </xs:simpleType>
910 <xs:simpleType name="ReasonText_String"
911 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
912     <xs:restriction base="xs:string">
913         <xs:maxLength value="512" />
914     </xs:restriction>
915 </xs:simpleType>
916 <xs:complexType name="Reason" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
917 schema-cim16#Reason">
918     <xs:sequence>
919         <xs:element minOccurs="1" maxOccurs="1" name="code" type="ReasonCode_String"
920 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Reason.code">
921             </xs:element>
922         <xs:element minOccurs="0" maxOccurs="1" name="text" type="ReasonText_String"
923 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Reason.text">
924             </xs:element>
925         </xs:sequence>
926     </xs:complexType>
927     <xs:simpleType name="YMDHM_DateTime"
928 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#DateTime">
929         <xs:restriction base="xs:string">
930             <xs:pattern value="((([0-9]{4})[\-](0[13578]|1[02])[\-](0[1-9]|12)[0-
931 9]|3[01])|([0-9]{4})[\-]((0[469])|(11))[\-](0[1-9]|12)[0-9]|30))T((([01][0-9]|2[0-
932 3]):[0-5][0-
933 9])Z)|(((13579)[26][02468][048]|13579)[01345789](0)[48]|(13579)[01345789][2468][048]
934 |[02468][048][02468][048]|02468[1235679](0)[48]|02468[1235679][2468][048]|0-
935 9[0-9][13579][26])[\-](02)[\-](0[1-9]|1[0-9]|2[0-9])T((([01][0-9]|2[0-3]):[0-5][0-
936 9])Z)|(((13579)[26][02468][1235679]|13579)[01345789](0)[01235679]|13579)[01345789][
937 2468][1235679]|02468[048][02468][1235679]|02468[1235679](0)[01235679]|02468][123
938 5679][2468][1235679]|0-9[0-9][13579][01345789])[\-](02)[\-](0[1-9]|1[0-9]|2[0-
939 8])T((([01][0-9]|2[0-3]):[0-5][0-9])Z)" />

```

```
940     </xs:restriction>
941   </xs:simpleType>
942   <xs:complexType name="ESMP_DateTimeInterval"
943 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#DateTimeInterval">
944     <xs:sequence>
945       <xs:element minOccurs="1" maxOccurs="1" name="start" type="YMDHM_DateTime"
946 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
947 cim16#DateTimeInterval.start">
948         </xs:element>
949       <xs:element minOccurs="1" maxOccurs="1" name="end" type="YMDHM_DateTime"
950 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
951 cim16#DateTimeInterval.end">
952         </xs:element>
953     </xs:sequence>
954   </xs:complexType>
955   <xs:complexType name="Time_Period"
956 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Period">
957     <xs:sequence>
958       <xs:element minOccurs="1" maxOccurs="1" name="timeInterval"
959 type="ESMP_DateTimeInterval" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
960 schema-cim16#Period.timeInterval">
961         </xs:element>
962       <xs:element minOccurs="1" maxOccurs="unbounded" name="Reason" type="Reason"
963 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Period.Reason">
964         </xs:element>
965     </xs:sequence>
966   </xs:complexType>
967   <xs:complexType name="TimeSeries"
968 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#TimeSeries">
969     <xs:sequence>
970       <xs:element minOccurs="1" maxOccurs="1" name="mRID" type="ID_String"
971 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
972 cim16#IdentifiedObject.mRID">
973         </xs:element>
974       <xs:element minOccurs="0" maxOccurs="1" name="version"
975 type="ESMPVersion_String" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
976 cim16#TimeSeries.version">
977         </xs:element>
978       <xs:element minOccurs="0" maxOccurs="unbounded" name="InError_Period"
979 type="Time_Period" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
980 cim16#TimeSeries.InError_Period">
981         </xs:element>
982       <xs:element minOccurs="0" maxOccurs="unbounded" name="Reason" type="Reason"
983 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#TimeSeries.Reason">
984         </xs:element>
985     </xs:sequence>
986   </xs:complexType>
987 </xs:schema>
```

988

989

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1000 *in electricity*
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- 1002 _____