



European Network of  
Transmission System Operators  
for Electricity

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# RESOURCE PLANNING IMPLEMENTATION GUIDE

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2022-06-28

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APPROVED DOCUMENT  
VERSION 1.0

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18 The force of the following words is modified by the requirement level of the document in which  
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- 20 • **SHALL:** This word, or the terms "REQUIRED" or "MUST", means that the definition is an  
21 absolute requirement of the specification.
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23 absolute prohibition of the specification.
- 24 • **SHOULD:** This word, or the adjective "RECOMMENDED", means that there may exist valid  
25 reasons in particular circumstances to ignore a particular item, but the full implications must  
26 be understood and carefully weighed before choosing a different course.
- 27 • **SHOULD NOT:** This phrase, or the phrase "NOT RECOMMENDED", means that there may  
28 exist valid reasons in particular circumstances when the particular behaviour is acceptable  
29 or even useful, but the full implications should be understood and the case carefully weighed  
30 before implementing any behaviour described with this label.
- 31 • **MAY:** This word, or the adjective "OPTIONAL", means that an item is truly optional.

## Revision History

Version	Release	Date	Paragraph	Comments
0	1	2021-09-09		First draft of the Resource Planning Implementation guide.
0	2	2021-12-03		Included the Activity diagram. Reviewed the Use cases diagram.
0	3	2022-02-01		The roles were reviewed to describe their exact papers on this IG. The document exchange section was reviewed. The dependency tables were added.
0	4	2022-02-18		The Acquiring SO was agreed to represent the German tool, for the German use case that all information from all German TSOs.
1	0	2022-06-28		Approved by MC.

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## 75 1 Scope

76 The objective of resource planning implementation guide is to make it possible for software  
77 vendors to develop an IT application for TSOs and RSCs that allow them to exchange  
78 information for the resource planning process.

79 The implementation guide is one of the building blocks for using UML (Unified Modelling  
80 Language) based techniques in defining processes and messages for interchange between  
81 actors in the electrical industry in Europe.

82 This guide provides a standard for enabling a uniform layout for the transmission of data  
83 between involved Market Participants to exchange data for the planning of resources. The  
84 implementation guide is developed for the harmonisation of the underlying data exchange  
85 process. The implementation guide refers to information models based on the European style  
86 market profile (ESMP), IEC 62325-351.

## 87 2 References

### 88 2.1 Normative references

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

93 • [IEC 62325-301:2018, Framework for energy market communications – Part 301:  
94 Common information model \(CIM\) extensions for markets;](#)

95 • [IEC 62325-351:2016, Framework for energy market communications – Part 351: CIM  
96 European market model exchange profile;](#)

97 • [IEC 62325-450:2013, Framework for energy market communications – Part 450: Profile  
98 and context modelling rules;](#)

99 • [IEC 62325-451-1:2017, Framework for energy market communications – Part 451-1:  
100 Acknowledgement business process and contextual model for CIM European market;](#)

101 • [IEC 62325-451-7:2021, Framework for energy market communications - Part 451-7:  
102 Balancing processes, contextual and assembly models for European style market](#)

103

### 104 2.2 Other references

105 • [The Harmonised Electricity Market Role Model;](#)

106 • [Commission Regulation \(EU\) 2017/2195 of 23 November 2017 establishing a guideline  
107 on electricity balancing \(EB GL\).](#)

108 ○ All continental European TSOs' proposal for Common settlement rules for  
109 intended exchanges of energy as a result of the frequency containment process  
110 and ramping period in accordance with the Article 50(3) of Commission  
111 Regulation (EU) 2017/2195 of 23 November 2017 establishing a guideline on  
112 electricity balancing.

113 ○ All continental European TSOs' proposal for Common settlement rules for all  
114 unintended exchanges of energy in accordance with the Article 51(1) of  
115 Commission Regulation (EU) 2017/2195 of 23 November 2017 establishing a  
116 guideline on electricity balancing.

117 • [Commission Regulation \(EU\) 2017/1485 of 2 August 2017 establishing a guideline on  
118 electricity transmission system operation \(SO GL\)](#)

119

120

121 **3 Terms and definitions**

122 **aFRR:** automatic Frequency Restoration Reserve. Means the FRR that can be activated by an  
123 automatic control device (load-frequency controller) designed to regulate the Frequency  
124 Restoration Control Error (FRCE) to zero.

125 **mFRR:** manual Frequency Restoration Reserve. Means the active power reserves that may be  
126 manually activated, available to restore system frequency to the nominal frequency and, for a  
127 synchronous area consisting of more than one LFC area, to restore power balance to the  
128 scheduled value.

129 **FCR:** Frequency Containment Reserve. means the active power reserves available to contain  
130 system frequency after the occurrence of an imbalance.

131 **RR:** Replacement Reserves. Means the reserves used to restore/support the required level of  
132 FRR to be prepared for additional system imbalances. This category includes operating  
133 reserves with activation time from Time to Restore Frequency up to hours.

134

## 135 4 The Resource Planning Business Process

### 136 4.1 General Introduction

137 The concept of system balancing may technically differ between the grid regions. System  
138 control however is basically the same and ensures that the Load Frequency Control remains  
139 consistent.

140 The business process described in this implementation guide covers the needs of the technical  
141 and commercial aspects of the system control currently used for the European interconnected  
142 systems.

143 Amongst the primary requirements, it is the necessity to provide for energy reserves in order to  
144 respond to unexpected events to keep the electricity system operational. Four types of reserves  
145 are collected together in order to guarantee an operational network: Frequency Containment  
146 Reserve, Automatic Frequency Restoration Reserve, Manual Frequency Restoration Reserve  
147 and Replacement Reserves. The definitions for these reserves can be found in the System  
148 Operation Guidelines<sup>1</sup> and is included in the Terms and Definitions topic of this Guide.

149 The reserves defined in this document can address the case of both active and reactive power.

150 The former ETSO Task Force Balance Management (TF BM) has developed several contractual  
151 models which describes how the trading of balancing services across borders could be  
152 facilitated. This section provides an overview of two of these models, covering the roles and  
153 responsibilities of each participant and which will be implemented in the Reserve Planning part.  
154 The involved participants are the Resource Providers (RP) and the System Operators (SO).

155 The principal role in these models is that of a Resource Provider which is defined as “A role  
156 that manages a resource and provides production/consumption schedules for it, if required”. A  
157 System Operator is defined as being “A party responsible for operating, ensuring the  
158 maintenance of and, if necessary, developing the system in a given area and, where applicable,  
159 its interconnections with other systems, and for ensuring the long-term ability of the system to  
160 meet reasonable demands for the distribution or transmission of electricity”.

161 Both definitions are based on the Harmonised Role Model<sup>2</sup> version from January 2022

162 The two models that have been developed are:

163 ➤ Model 1 – System Operator - Resource Provider

164 ➤ Model 2 – System Operator - System Operator

165 The attributes of each model are developed in the succeeding paragraphs. This guide is  
166 focused on the model 1 and 2 covering existing reserve market models. The business  
167 process addresses all the processes starting from a Resource Object has been pre-  
168 qualified by the System Operator as being acceptable for use as a Reserve Object through  
169 to activation of reserves. For this version of the Resource Planning IG, standard profiles  
170 for prequalification process is not tackled.

### 171 4.2. Model 1 (System Operator – Resource Provider)

172 The main principle behind model 1 is that a Resource Provider with Reserve Objects in a given  
173 Scheduling Area can contract for the provision of balancing services directly with a System  
174 Operator of another Scheduling Area (which may be a different country with eventually different  
175 market rules).

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<sup>1</sup> COMMISSION REGULATION (EU) 2017/1485 establishing a guideline on electricity transmission system operation.  
Source <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32017R1485&from=EN>

<sup>2</sup> The Harmonised electricity market Role Model. Source: [https://eepublicdownloads.entsoe.eu/clean-documents/EDI/Library/HRM/Harmonised\\_Role\\_Model\\_2020-01.pdf](https://eepublicdownloads.entsoe.eu/clean-documents/EDI/Library/HRM/Harmonised_Role_Model_2020-01.pdf)

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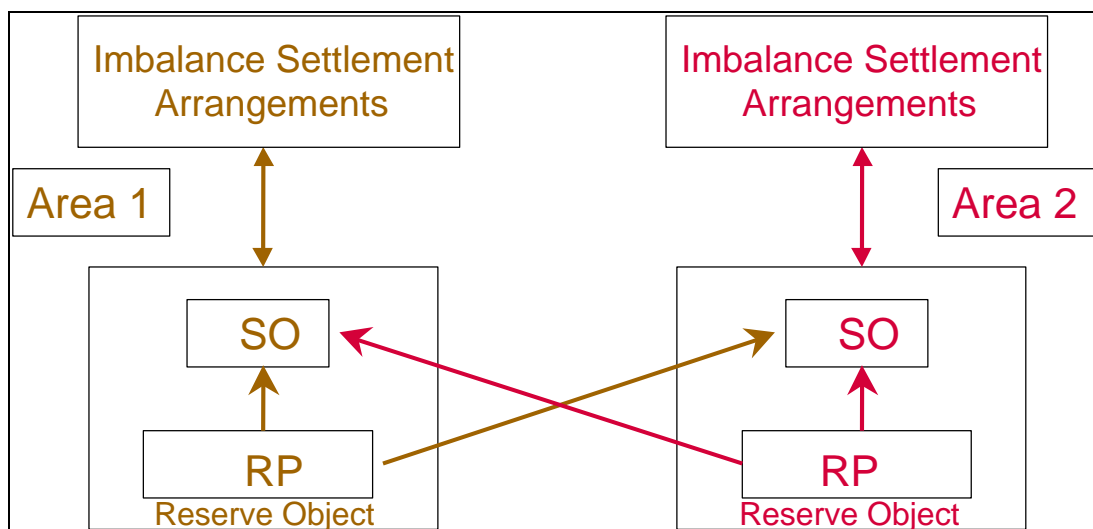


Figure 1 - Contractual Arrangements for Trading Balancing Services Using Model 1

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The key features of this model, as outlined in the diagram in Figure 1 - Contractual Arrangements for Trading Balancing Services Using Model 1, are:

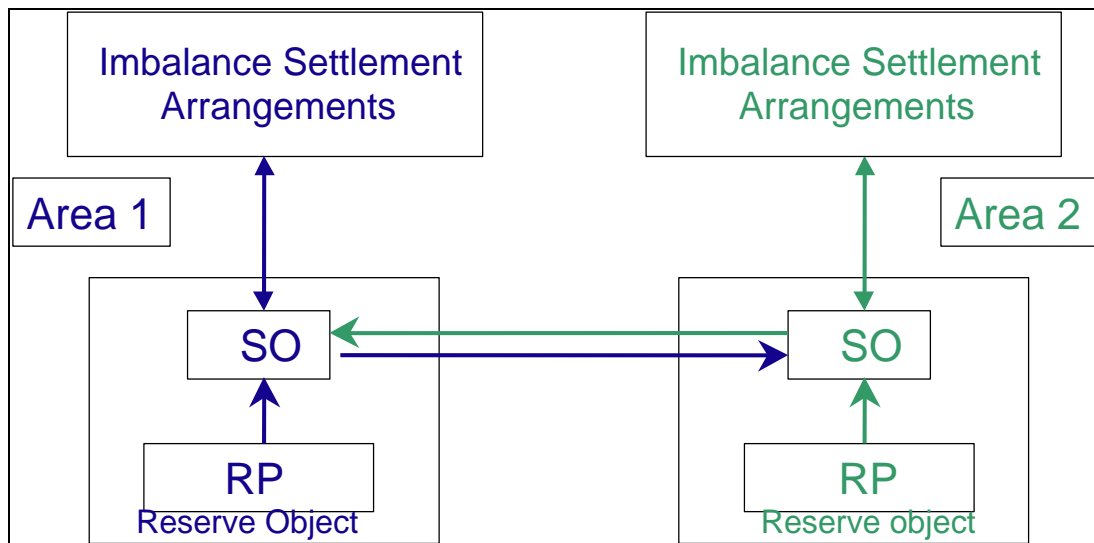
- The System Operators of Area 1 and Area 2 are different and are responsible for balancing in their own area.
- The Resource Provider's Reserve Object in Area 1 is physically connected to the network controlled by the System Operator in Area 1 (same arrangement exists in Area 2).
- Each area has its own set of electricity market rules, including those relating to imbalance settlement.
- The Resource Provider's Reserve Object in Area 1 may provide balancing services to the System Operator in Area 1.
- The Resource Provider's Reserve Object in Area 1 may provide balancing services directly to the System Operator in Area 2. *Note: this could also apply to an internal market in which case the Acquiring and Connecting System Operator roles are played by the same actor.*
- It is presupposed, that in the case of cross border reserve allocation the Resource Provider is responsible for the reservation of sufficient transport capacity at any time of his reserve contract.

#### 4.3. Model 2 (System Operator – System Operator)

The main principle behind model 2 is that System Operators will contract for the provision of balancing services to each other. Each System Operator will then be responsible for taking the necessary action in his own area to deliver the balancing service to the other System Operator.

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205 **Figure 2 - Contractual Arrangements for Trading Balancing Services Using Model 2**  
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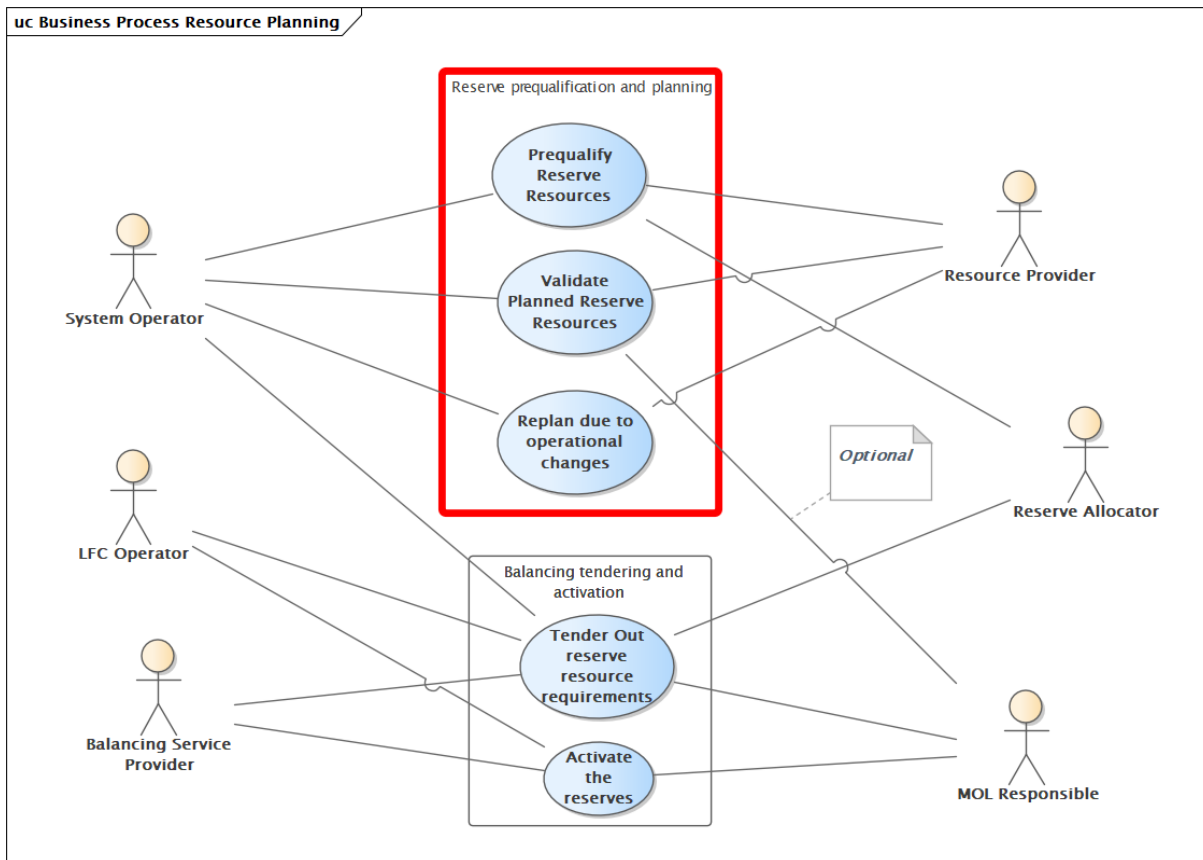
207 The key features of this model, as outlined in the diagram in figure 3, are:

- 208 • The System Operators of Area 1 and Area 2 are different. They are responsible for  
209 balancing their own area
- 210 • The Resource Provider's Reserve Object in Area 1 is physically connected to the  
211 network controlled by the System Operator of Area 1 (same arrangement in Area 2)
- 212 • Each area has its own set of electricity market rules, including those relating to  
213 imbalance settlement
- 214 • The Resource Provider's Reserve Object in Area 1 may provide balancing services for  
215 the System Operator of Area 1
- 216 • The Resource Provider in Area 1 shall **not** provide balancing services directly to the  
217 System Operator of Area 2
- 218 • The System Operator of Area 1 may contract with the System Operator of Area 2 to  
219 provide Balancing Services (and vice versa)
- 220 • The System Operator of Area 1 is responsible for taking the necessary action in his own  
221 area to deliver balancing service to the System Operator of Area 2 and vice-versa. The  
222 acquiring SO is responsible for the reservation for the cross-border capacity.

223

224 **5 Use cases**

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**Figure 3 - Use Case diagram**

The Table 1 - Role labels and descriptions gives a list of roles involved in the business process.

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**Table 1 - Role labels and descriptions**

Role Label	Role Description
Merit Order List Responsible	Responsible for available tenders submitted by the BSP and establish a Merit Order List of the bids to be activated.
System Operator	Within the Resource Planning IG, the System Operators (SOs) are divided in “Connecting” and “Providing” System Operator. The “Connecting” SO carries out technical qualification for each Registered Resource to ensure the fulfilment of technical requirements and provides the identification of all the characteristics and the result of this qualification. The “connecting” SO is also responsible to validate the Registered Resource capacity. The “Acquiring” SO must inform the contracted reserves. Besides, it must forecast the necessary reserve. In the case there is a central system handling the process for multiple SOs, this central system takes the role of an “Acquiring” SO.
Reserve Allocator	Responsible for reserve requirements information and bids assignment.
Resource Provider	The Resource Provider is responsible for providing information about energy capacity, including requests for pre-qualification of the Registered Resource from both areas.
Balancing Service Provider	The BSP is responsible for submitting the energy bids.

Role Label	Role Description
LFC Operator	Responsible for operational security and system balancing efficiency.

231

232 The Table 2 – Resource planning use cases gives a list of use cases for the resource planning  
233 IG.

234

235

**Table 2 – Resource planning use cases**

Use case label	Roles involved	Action descriptions and assertions
Prequalify reserve resources	<ul style="list-style-type: none"> <li>• System Operator</li> <li>• Resource Provider</li> <li>• Reserve allocator</li> </ul>	<p>The pre-qualification process is defined and monitored by the Connecting System Operator, in order to certify that a Registered Resource can be used as a Reserve Resource.</p> <p>Each Resource Provider shall meet the market rules criteria for the energy market in which he intends to participate. The Resource Provider shall request to its Connecting System Operator the pre-qualification of the Registered resources that he is willing to use, may it be a consumption unit or a production unit.</p> <p>The Connecting System Operator carries out the technical qualification for each Registered Resource. It ensures that it meets the technical requirements that have been established for each kind of reserve (FCR, aFRR, mFRR, RR), and provides the identification of all its characteristics, such as capacity, rate of response, activation time, etc.</p> <p>The Connecting System Operator then informs the Resource Provider of the pre-qualification results of its Registered Resources.</p> <p>The Connecting System Operator shall inform the Reserve Allocator of all new pre-qualified Reserve Resources that are available.</p>

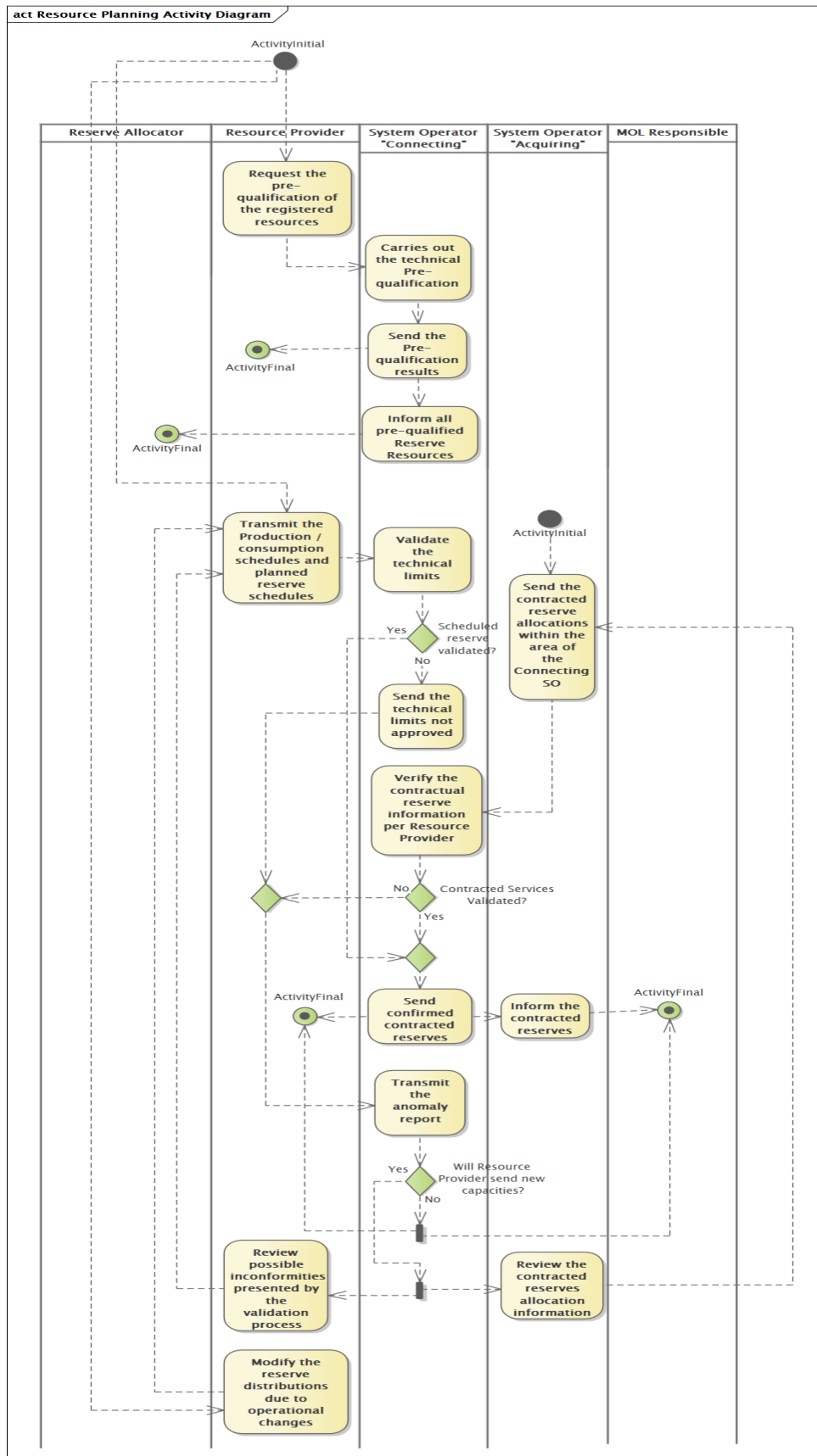
Use case label	Roles involved	Action descriptions and assertions
<p>Validate planned reserve resources</p>	<ul style="list-style-type: none"> <li>• Connecting System Operator</li> <li>• Resource Provider</li> <li>• Acquiring System Operator (optional)</li> <li>• MOL Responsible (optional)</li> </ul>	<p>For each market time unit, the Resource Provider must transmit to the Connecting System Operator:</p> <ul style="list-style-type: none"> <li>• the production/consumption schedules of all its Registered Resources</li> <li>• the planned reserve schedules of all the Reserve Resources that may be called up during the period. If applicable, it shall be distinguished between the planned Reserve Resources contracted with the Connecting System Operator and the planned Reserve Resources contracted with any other Acquiring System Operator(s)</li> </ul> <p>The Connecting System Operator shall perform a validation process of the technical limits to ensure that the total capacity of the Registered Resource is not being exceeded. In the case of anomalies in the schedules, the Connecting System Operator sends to the Resource Provider a document indicating anomalies in the submitted schedules. The Resource Provider has to correct the inconformity with the technical limits and to resubmit the schedules to the Connecting System Operator.</p> <p>At any time during the validation time frame the Acquiring System Operator shall send, if applicable, all the reserve allocations that have been contracted with the Resource Providers within the area of the Connecting System Operator.</p> <p>After the successful validation of the technical limits the Connecting System Operator optionally performs a verification of the contractual reserve information per Resource Provider.</p> <p>If there is a discrepancy between the submission of the Resource Provider and the Acquiring System Operator, the Connecting System Operator transmits to each of them an anomaly report indicating the misallocation of reserves. Either the Resource Provider or the Acquiring System Operator has to take corrective actions and to resubmit the schedules in question.</p> <p>After the technical limits and depending on the case the contracted services are validated successfully, the Connecting System Operator sends the confirmed contracted reserves to the Acquiring System Operator and to the Resource Provider. The Acquiring System Operator informs the MOL Responsible of those contracted reserves.</p>

Use case label	Roles involved	Action descriptions and assertions
Replan due to operational changes	<ul style="list-style-type: none"> <li>• System Operator</li> <li>• Resource Provider</li> </ul>	<p>An operational change can be done due to outages of a production unit, deviation in production and load, load outages, network disturbances, intra-day trading, etc.</p> <p>Whenever the Resource Provider has to modify the distribution of reserves between Reserve Resources due to operational changes, he shall inform the Connecting System Operator immediately by sending a revised Planned Resource schedule and / or a revised consumption/production schedule for the Registered Resources that are involved.</p>
Tender out reserve resources requirements	<ul style="list-style-type: none"> <li>• System Operator (LFC Operator)</li> <li>• Reserve allocator</li> <li>• MOL Responsible</li> <li>• Resource Provider (Balancing Service Provider)</li> </ul>	<p>For each period the Acquiring System Operator forecasts its needs for reserve resources and informs the Reserve Allocator.</p> <p>The Reserve Allocator informs the market of the reserve requirements. The Balancing Service Providers send their balancing energy bids to the reserve allocator.</p> <p>The Reserve Allocator determines which bids meet the reserve requirements and assigns the bids.</p>
Activate the reserves	<ul style="list-style-type: none"> <li>• LFC Operator</li> <li>• MOL Responsible</li> <li>• Balancing Service Provider</li> </ul>	<p>The MOL Responsible manages the available energy bids submitted by the Balancing Service Providers and validated by the Connecting System Operator and establish a merit order list of the bids that have to be activated in order to satisfy the overall needs.</p> <p>For the real time management of the system, the acquiring LFC Operator shall request some reserves of standard products or specific products to ensure operational security or to maintain efficiently the system balance between consumption and production.</p> <p>To meet this balancing or congestion management needs, the connecting LFC Operator shall activate cost-effective balancing energy bids available for delivery in its control area, and that have been selected by the MOL Responsible (local MOL Responsible or European Common Platforms).</p> <p>Consequently, the acquiring LFC Operator issues an order to the Balancing Services Provider to activate the reserves that have been offered through its energy bids.</p>

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238 5.1 Activity diagram

239 This topic demonstrates the activity diagram for this implementation guide.



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Figure 4 - Activity diagram

242  
243 As soon as the Resource Provider wants to apply for a registered resource, this resource must  
244 be sent to the connecting SO for pre-qualification.

245  
246 The connecting SO carries out technical qualification of each registered resource to ensure the  
247 minimal technical requirements acceptability for FCR, aFRR, mFRR and RR. Then the  
248 connecting SO provides identification for all characteristics. The results are sent to the  
249 Resource Provider. The connecting SO also shall inform the Reserve Allocator about all new  
250 available pre-qualified reserve resources.

251  
252 After the pre-qualification process, the Resource Provider sends the following information to  
253 the connecting SO:

- 254 • the production/consumption schedules of all its Registered Resources and;
- 255 • the planned reserve schedules of all the Reserve Resources that may be called up  
256 during the period. If applicable, it shall be distinguished between the planned Reserve  
257 Resources contracted with the Connecting System Operator and the planned Reserve  
258 Resources contracted with any other Acquiring System Operator(s).

259 The connecting SO starts a validation process for the information sent by the Resource  
260 Provider. to ensure that the total capacity is not exceeded.

261 In case of failure on validation, the connecting SO sends all technical limits that did not pass  
262 the validation to the Resource Provider and the process must be restarted.

263  
264 At any time during the validation time frame the Acquiring System Operator shall send, if  
265 applicable, all the reserve allocations that have been contracted with the Resource Providers  
266 within the area of the Connecting System Operator

267  
268 The connecting SO checks for any divergency in the contracted services. In case of failures the  
269 connecting SO shall send an anomaly report to both the acquiring SO and to the Resource  
270 Provider about the failed contracted services. Both must review their information and restart  
271 the process.

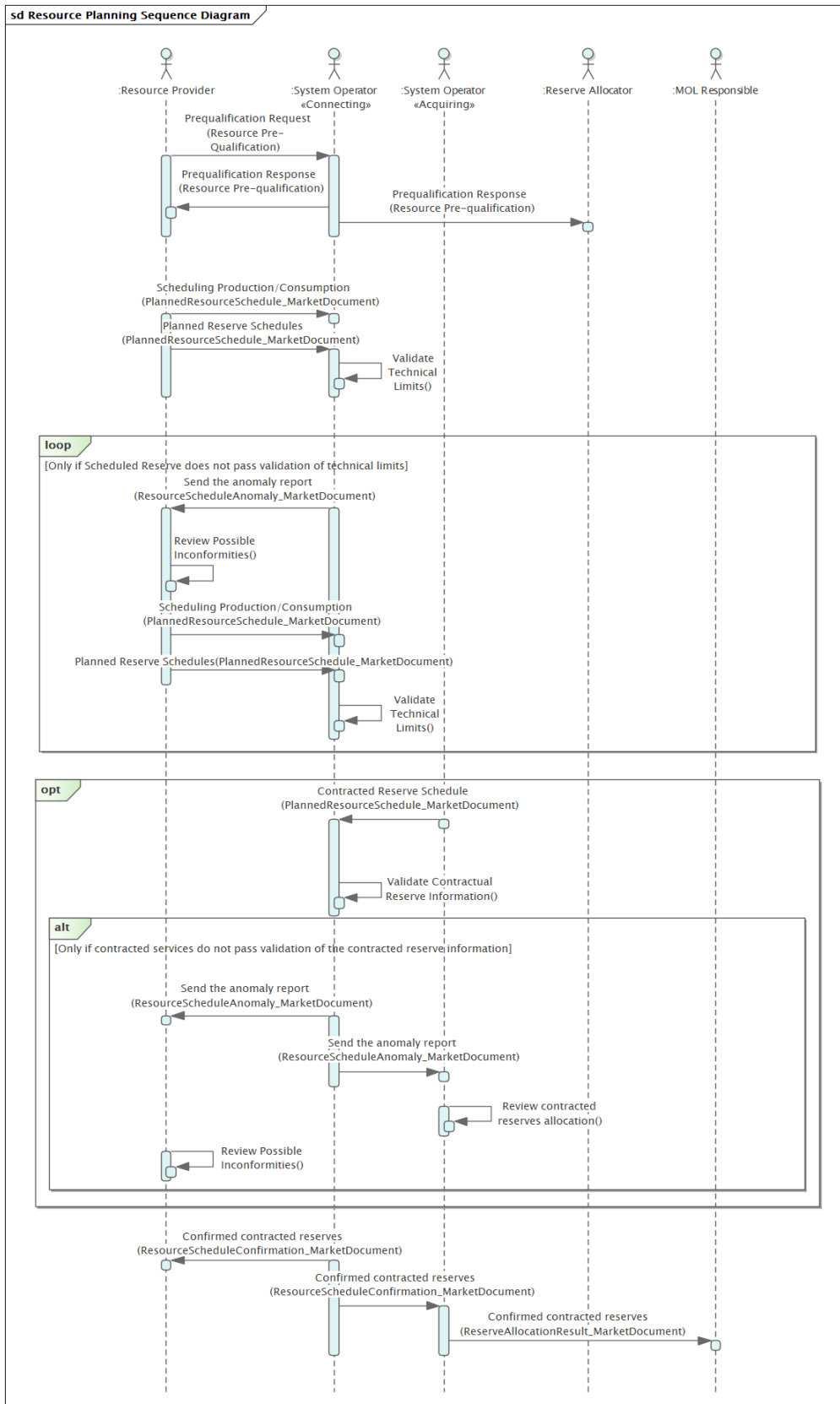
272 In case the technical limits and depending on the case the contracted services are successfully  
273 validated, the connecting SO sends the contracted reserves to the acquiring SO and to the  
274 Resource provider. Also, the acquiring SO informs the MOL of those contracted services.

275  
276 In case the Resource Provider must modify the distribution of reserves between reserve  
277 resources, he shall send immediately a revised planned resource schedule to the connecting  
278 SO and/or a revised consumption/production schedule for the involved Registered Resource.  
279

280 5.2 Document exchange processes

281 5.2.1 General overview

282 Next figure shows a general sequence diagram of the resource planning procedure.



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284

Figure 5 - Sequence diagram



285 The use cases are supported by the following document exchanges:

286 **5.2.1.1 Scheduling Production/Consumption –**  
287 **PlannedResourceSchedule\_MarketDocument**

288 For each market time unit, the Resource Provider must transmit to the Connecting System  
289 Operator the production/consumption schedules of all its registered resources. This information  
290 is sent with a Planned Resource Schedule document.

291 **5.2.1.2 Planned Reserve Schedule – PlannedResourceSchedule\_MarketDocument**

292 For each market time unit, the Resource Provider must transmit to the Connecting System  
293 Operator the planned reserve schedules of all the reserve resources that may be called up  
294 during the period. This information is sent with a Planned Resource Schedule document.

295 **5.2.1.3 Send the Anomaly Report –**  
296 **ResourceScheduleAnomalyReport\_MarketDocument**

297 If there is an anomaly in the schedules, the Connecting System Operator sends to the Resource  
298 Provider the anomalies referred to the submitted schedules.

299 **5.2.1.4 Contracted Reserve Schedule – PlannedResourceSchedule\_MarketDocument**

300 At any time of the validation time frame the Acquiring SO shall send, if applicable, all the reserve  
301 allocations that have been contracted to the Connecting SO for a reserve validation.

302 **5.2.1.5 Send the Anomaly Report –**  
303 **ResourceScheduleAnomalyReport\_MarketDocument**

304 In case the contracted services do not pass validation, the Connecting SO transmits to the  
305 Acquiring SO and to the Resource Provider the anomaly report.

306 **5.2.1.6 Confirmed Contracted Reserves –**  
307 **ReserveScheduleConfirmation\_MarketDocument**

308 The Connecting SO sends the confirmed contracted reserves to the Acquiring SO and to the  
309 Resource Provider.

310 **5.2.1.7 Confirmed Contracted Reserves – ReserveAllocationResult\_MarketDocument**

311 The Acquiring SO must inform the MOL Responsible regarding the contracted reserves

312

313

314 **5.3 Documents overview**

315 The document exchange processes of resource planning described in the previous chapter  
316 require sending and receiving various ESMP documents. The information to be exchanged is:

317

- 318 • PlannedResourceSchedule\_MarketDocument v6.2 based on IEC 62325-351
- 319 • ResourceScheduleAnomaly\_MarketDocument v6.1 based on IEC 62325-351
- 320 • ResourceScheduleConfirmation\_MarketDocument v6.1 based on IEC 62325-351
- 321 • ReserveAllocationResult\_MarketDocument v6.3 based on IEC 62325-351

322

323 **5.4 PlannedResourceSchedule\_MarketDocument Dependency Table – for Resource**  
324 **Provider Resource Schedule type**

PlannedResourceSchedule_MarketDocument				
Class	Attributes	Scheduling Production/ Consumption	Planned Reserve Schedules	Contracted Reserve Schedule
Planned Resource Schedule_Market Document	mRID	Used		
	revisionNumber	Used		
	type	A67: Resource Provider Schedule for production / Consumption	A14: Resource Provider Resource Schedule	A15: Acquiring System Operator Reserve Schedule
	process.processType	A01: Day ahead. A02: Intra day incremental <sup>3</sup> A17: Schedule day A14: Forecast A40: Intraday process		
	sender.mRID	EIC Code of Resource Provider	EIC Code of Resource Provider	EIC Code of System Operator
	Sender.marketRole.type <sup>4</sup>	A27: Resource Provider	A27: Resource Provider	A04: "Acquiring" SO
	receiver.mRID	EIC Code of System Operator	EIC Code of System Operator	EIC Code of Resource Provider

<sup>3</sup> The code is included for historical reason

<sup>4</sup> Any other roles according to local market roles from the ENTSO-E code list.

	receiver.marketRole.type	A04: "Connecting " SO	A04: "Connecting" SO	A04: "Connecting" SO
	createdDateTime	Used		
	schedule_Period.timeInterval	Used. Daily		
	Domain	Not Used		
	Subject.mRID	Not Used	The EIC of the Resource Provider to whom the schedules are being submitted.	The EIC of the Resource Provider to whom the schedules are being submitted.
	subject.marketRole.type	Not Used	A27: Resource Provider	A27: Resource Provider
Planned Resources_ Time Series	mRID	Used		
	businessType	A01 = Production. A04 = Consumption. A07 = Net Consumption/Production A10 = Tertiary Control <sup>5</sup> . A11 = Primary Control. A12 = Secondary Control. A23 = Balance management. A49 = Inflow. A50 = Water extraction. A51 = Turbined water. A52 = Water spillage. A60 = Minimum possible. A61 = Maximum available. A70 = Production, unavailable. A71 = Supplementary available generation. A72 = Interruptible consumption. A77 = Production, dispatchable. A78 = Consumption dispatchable A79 = Production, non-dispatchable. A80 = Consumption, non-dispatchable. A95 = Frequency containment reserve A96 = Automatic Frequency Restoration Reserve A97 = Manual Frequency Restoration Reserve A98 = Replacement Reserve		
	flowDirection.direction	Not Used.	A01 = UP, this signifies that the available power can be used by the Acquiring area	A01 = UP, this signifies that the available power can be used by the Acquiring area

<sup>5</sup> The codes A10, A11 and A12 are included only for historical reason.

			to increase energy. A02 = DOWN, this signifies that the available power can be used by the Acquiring area to decrease energy. A03 = UP and DOWN, this signifies that the UP and Down values are equal.	to increase energy. A02 = DOWN, this signifies that the available power can be used by the Acquiring area to decrease energy. A03 = UP and DOWN, this signifies that the UP and Down values are equal.
product	8716867000016 = Active power. 8716867000030 = Active energy. 8716867000023 = Reactive power. 8716867000047 = Reactive energy. 8716867009911 = Water			
connecting_Domain.mRID	Used			
registeredResource.mRID	Used	Used	Not Used	
resourceProvider.mRID	Used			
acquiring_Domain.mRID	Not Used	Mandatory <sup>6</sup> or Not Used	Mandatory	
marketAgreement.type	Not Used	Dependent on local market rules	Dependent on local market rules	
marketAgreement.mRID	Not Used	Dependent on local market rules	Dependent on local market rules	
measurement_Unit.name	MAW: Megawatt MWH = Megawatt hours MAR = megavolt ampere reactive MAH = megavolt ampere reactive hours			
objectAggregation	Dependent on local market rules			
mktPSRType	Dependent on local market rules			
CurveType	A01 = Sequential fixed size block			

<sup>6</sup> Only when Business types are A10, A11, A12, A95, A96, A97 and A98.

		A03 = Variable sized block		
Unavailable Reserve_ Time Series	mRID	Used		
	businessType	A10 = Tertiary Control <sup>7</sup> . A11 = Primary Control <sup>7</sup> . A12 = Secondary Control <sup>7</sup> . A95 = Frequency containment reserve A96 = Automatic Frequency Restoration Reserve A97 = Manual Frequency Restoration Reserve A98 = Replacement Reserve		
	flowDirection.direction	Not Used	A01 = UP A02 = DOWN A03 = UP and DOWN	A01 = UP A02 = DOWN A03 = UP and DOWN
	product	8716867000016 = Active power. 8716867000030 = Active energy. 8716867000023 = Reactive power. 8716867000047 = Reactive energy. 8716867009911 = Water		
	connecting_Domain.mRID	Used		
	registeredResource.mRID	Used	Used	Not Used
	resourceProvider.mRID	Used		
	substituteResourceProvider_MarketParticipant.mRID	Dependent on local market rules		
	SubstituteResourceProvider_MarketRole.type	Dependent on local market rules		
	substituteRegisteredResource.mRID	Dependent on local market rules		
	acquiring_Domain.mRID	Not Used	Mandatory <sup>8</sup> or Not Used	Mandatory
	marketAgreement.type	Not Used	Dependent on local market rules	Dependent on local market rules
	marketAgreement.mRID	Not Used	Dependent on local market rules	Dependent on local market rules
	measurement_Unit.name	MAW: Megawatt		

<sup>7</sup> The codes A10, A11 and A12 are included only for historical reason

<sup>8</sup> Only when Business types are A10, A11, A12, A95, A96, A97 and A98.

		<p>MWH = Megawatt hours</p> <p>MAR = megavolt ampere reactive</p> <p>MAH = megavolt ampere reactive hours</p>
	curveType	<p>A01 = Sequential fixed size block</p> <p>A03 = Variable sized block</p>
Series_ Period	timeInterval	Used
	resolution: Duration	PT15M
Reason	Code	Used
	Text	Used
Point	position	Used
	quantity	Used

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326  
327

5.5 **ResourceScheduleAnomaly\_MarketDocument** Dependency Table between SO and Resource Provider

ResourceScheduleAnomaly_MarketDocument		
Class	Attribute	Send the Anomaly Report (between “Connecting” SO and Resource Provider)
Resource Schedule Anomaly_ Market Document	mRID	Used
	sender.mRID	EIC Code of System Operator
	sender.marketRole.type	A04: “Connecting” System Operator
	receiver.mRID	EIC Code of Resource Provider
	receiver.marketRole.type	A27: Resource Provider
	createdDateTime	Used. YYYY-MM-DDTHH:MM:SSZ.
	schedule_Period.timeInterval	Used
Sender Original_ Market Document	mRID	Used
	revisionNumber	Used
	Sender.mRID	Used

TimeSeries	mRID	Used	
	businessType	Used	
		Scheduling Production / Consumption	Planned Reserve Schedules
	flowDirection.direction	Not Used	Used
	product	Used	
	connecting_Domain.mRID	Used	
	registeredResource.mRID	Used	
	resourceProvider.mRID	Used	
	SubstituteResourceProvider.mRID	Dependent on local market rules	
	substituteResourceProvider_marketRole.type	Dependent on local market rules	
	substituteRegisteredResource.mRID	Dependent on local market rules	
		Scheduling Production / Consumption	Planned Reserve Schedules
	acquiring_Domain.mRID	Not Used	Mandatory <sup>9</sup> or Not Used
	marketAgreement.type	Not Used	Dependent on local market rules
	marketAgreement.mRID	Not Used	Dependent on local market rules
	measurement_Unit.name	MAW: Megawatt MWH = Megawatt hours MAR = megavolt ampere reactive MAH = megavolt ampere reactive hours	
	objectAggregation	Dependent on local market rules	
	mktPSRType	Dependent on local market rules	

<sup>9</sup> Only when Business types are A10, A11, A12, A95, A96, A97 and A98.

	curveType	Used
Series_ Period	timeInterval	Used
	resolution: Duration	Used
Reason	Code	<p>At the header level</p> <p>A02 = Message fully rejected</p> <p>A03:= Message contains errors at the time series level.</p> <p>A57 = Deadline limit exceeded</p> <p>A60 = Inter-area transit schedule exceeds nominated schedule</p> <p>At the timeseries level</p> <p>A09 = Time series not matching</p> <p>A27 = Cross border capacity exceeded</p> <p>A28 = Counterpart time series missing</p> <p>A29 = Counterpart time series quantity differences.</p> <p>A65 = Reserve Technical limits exceeded</p> <p>A66 = Planned reserves do not correspond with contractual data</p> <p>A67 = Limit data is not available</p> <p>A68 = Reserve Object not qualified for reserve type</p> <p>Note: Other codes defined in the ENTSO-E Code List of Reason Codes may be used as required by local market rules.</p>
	Text	Used
Point	position	Used
	quantity	Used

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329 5.6 ResourceScheduleAnomaly\_MarketDocument Dependency Table between the SOs

330

ResourceScheduleAnomaly_MarketDocument
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Class	Attribute	Send the Anomaly Report (between “Connecting” SO and “Acquiring” SO)
Resource Schedule Anomaly_ Market Document	mRID	Used
	sender.mRID	EIC Code of System Operator
	sender.marketRole.type	A04: “Connecting” System Operator
	receiver.mRID	EIC Code of System Operator
	receiver.marketRole.type	A04: “Acquiring” System Operator
	createdDateTime	Used. YYYY-MM-DDTHH:MM:SSZ.
	schedule_Period.timeInterval	Used
Sender Original_ Market Document	mRID	Used
	revisionNumber	Used
	Sender.mRID	Used
TimeSeries	mRID	Used
	businessType	Used
	flowDirection.direction	Used
	product	Used
	connecting_Domain.mRID	Used
	registeredResource.mRID	Not Used
	resourceProvider.mRID	Used
	SubstituteResourceProvider.mRID	Dependent on local market rules
	substituteResourceProvider_MarketRole.type	Dependent on local market rules
	substituteRegisteredResource	Dependent on local market rules
	acquiring_Domain.mRID	Mandatory

	marketAgreement.type	Dependent on local market rules
	marketAgreement.mRID	Dependent on local market rules
	measurement_Unit.name	MAW: Megawatt MWH = Megawatt hours MAR = megavolt ampere reactive MAH = megavolt ampere reactive hours
	objectAggregation	Dependent on local market rules
	mktPSRType	Dependent on local market rules
	curveType	Used
Series_ Period	timeInterval	Used
	resolution: Duration	Used
Reason	Code	<p>At the header level</p> <p>A02 = Message fully rejected</p> <p>A03:= Message contains errors at the time series level.</p> <p>A57 = Deadline limit exceeded</p> <p>A60 = Inter-area transit schedule exceeds nominated schedule</p> <p>At the timeseries level</p> <p>A09 = Time series not matching</p> <p>A27 = Cross border capacity exceeded</p> <p>A28 = Counterpart time series missing</p> <p>A29 = Counterpart time series quantity differences.</p> <p>A65 = Reserve Technical limits exceeded</p> <p>A66 = Planned reserves do not correspond with contractual data</p> <p>A67 = Limit data is not available</p> <p>A68 = Reserve Object not qualified for reserve type</p> <p>Note: Other codes defined in the ENTSO-E Code List of Reason Codes may be used as required by local market rules.</p>

	Text	Used
Point	position	Used
	quantity	Used

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332 5.7 **ResourceScheduleConfirmation\_MarketDocument Dependency Table between SO**  
333 **and Resource Provider**

334

ResourceScheduleConfirmation_MarketDocument		
Class	Attribute	Confirmed Contracted Reserves (between “Connecting” SO and Resource Provider)
Resource Schedule Confirmation_ Market Document	mRID	Used
	type	Used
	sender.mRID	EIC Code of the System Operator
	sender.marketRole.type	A04: “Connecting” System Operator
	receiver.mRID	EIC Code of the Resource Provider
	receiver.marketRole.type	A27: Resource Provider
	createdDateTime	Used. YYYY-MM-DDTHH:MM:SSZ
Original_ Market Document	schedule_Period.timeInterval	Used. YYYY-MM-DDTHH:MMZ/YYYY-MM-DDTHH:MMZ
	mRID	Used
	revisionNumber	Used
	domain.mRID	Used
	subject.mRID	Used
	subject.marketRole.type	Used
Planned	process.processType	Used
	mRID	Used

Resource_ Time Series	businessType	Used	
		Scheduling Production / Consumption	Planned Reserve Schedules
	flowDirection.direction	Not Used	Used
	product	Used	
	connecting_Domain.mRID	Used	
	registeredResource.mRID	Used	
	resourceProvider.mRID	Used	
		Scheduling Production / Consumption	Planned Reserve Schedules
	acquiring_Domain.mRID	Not Used	Mandatory <sup>10</sup> or Not Used
	marketAgreement.type	Not Used	Dependent on local market rules
	marketAgreement.mRID	Not Used	Dependent on local market rules
	measurement_Unit.name	MAW: Megawatt  MWH = Megawatt hours  MAR = megavolt ampere reactive  MAH = megavolt ampere reactive hours	
	objectAggregation	Dependent on local market rules	
	curveType	Used	
Unavailable Reserve_ Time Series	mRID	Used	
	businessType	Used	
	flowDirection.direction	Used	
	product	Used	
	Connecting_Domain.mRID	Used	

<sup>10</sup> Only when Business types are A10, A11, A12, A95, A96, A97 and A98.

	RegisteredResource.mRID	Not Used	
	resourceProvider_MarketParticipant.mRID	Used	
	substituteResourceProvider_MarketParticipant.mRID	Dependent on local market rules	
	SubstituteResourceProvider_MarketRole.type	Dependent on local market rules	
	substituteRegisteredResource.mRID	Dependent on local market rules	
		Scheduling Production / Consumption	Planned Reserve Schedules
	acquiring_Domain	Not Used	Mandatory <sup>11</sup> or Not Used
	marketAgreement.type	Not Used	Dependent on local market rules
	marketAgreement.mRID	Not Used	Dependent on local market rules
	measurement_Unit.name	MAW: Megawatt MWH = Megawatt hours MAR = megavolt ampere reactive MAH = megavolt ampere reactive hours	
	objectAggregation	Dependent on local market rules	
	mktPSRType	Dependent on local market rules	
	curveType	Used	
Series_ Period	timeInterval	Used	
	resolution: Duration	Used	
Reason	Code	At the message level: A06 = Schedule global position accepted	

<sup>11</sup> Only when Business types are A10, A11, A12, A95, A96, A97 and A98.

		<p>A07 = Schedule global position partially accepted</p> <p>A08 = Schedule global position rejected</p> <p>At the timeseries level:</p> <p>A20 = Time series fully rejected</p> <p>A63 = Time series modified</p> <p>At the time interval level:</p> <p>A43 = Quantity increased</p> <p>A44 = Quantity decreased</p> <p>Other codes defined in the ENTSO-E Code List of Reason Codes may be used as required by local market rules</p>
	Text	Used
Point	position	Used
	quantity	Used

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336 5.8 ResourceScheduleConfirmation\_MarketDocument Dependency Table between SOs

ResourceScheduleConfirmation_MarketDocument		
Class	Attribute	Confirmed Contracted Reserves (between "Connecting" SO and Resource Provider)
Resource Schedule Confirmation_Market Document	mRID	Used
	type	Used
	sender.mRID	EIC Code of the System Operator
	sender.marketRole.type	A04: "Connecting" System Operator
	receiver.mRID	EIC Code of the Resource Provider
	receiver.marketRole.type	A27: Resource Provider
	createdDateTime	Used. YYYY-MM-DDTHH:MM:SSZ

	schedule_Period.timeInterval	Used. YYYY-MM-DDTHH:MMZ/YYYY-MM-DDTHH:MMZ
Original_ Market Document	mRID	Used
	revisionNumber	Used
	domain.mRID	Used
	subject.mRID	Used
	subject.marketRole.type	Used
	process.processType	Used
Planned Resource_ Time Series	mRID	Used
	businessType	Used
	flowDirection.direction	Used
	product	Used
	connecting_Domain.mRID	Used
	registeredResource.mRID	“Not Used”
	resourceProvider.mRID	Used
	acquiring_Domain.mRID	Mandatory
	marketAgreement.type	Dependent on local market rules
	marketAgreement.mRID	Dependent on local market rules
	measurement_Unit.name	MAW: Megawatt MWH = Megawatt hours MAR = megavolt ampere reactive MAH = megavolt ampere reactive hours
	objectAggregation	Dependent on local market rules
mktPSRType	Dependent on local market rules	

	curveType	Used
Unavailable Reserve_ Time Series	mRID	Used
	businessType	Used
	flowDirection.direction	Used
	product	Used
	Connecting_Domain.mRID	Used
	registeredResource.mRID	Not Used
	resourceProvider_ MarketParticipant.mRID	Used
	substituteResourceProvider_ MarketParticipant.mRID	Dependent on local market rules
	substituteResourceProvider_ MarketRole.type	Dependent on local market rules
	substituteRegisteredResource.mRID	Dependent on local market rules
	acquiring_Domain	Used
	marketAgreement.type	Dependent on local market rules
	marketAgreement.mRID	Dependent on local market rules
	measurement_Unit.name	MAW: Megawatt MWH = Megawatt hours MAR = megavolt ampere reactive MAH = megavolt ampere reactive hours
	objectAggregation	Dependent on local market rules
mktPSRType	Dependent on local market rules	
curveType	Used	
Series_ timeInterval	Used	



Period	resolution: Duration	Used
Reason	Code	<p>At the message level:</p> <p>A06 = Schedule global position accepted</p> <p>A07 = Schedule global position partially accepted</p> <p>A08 = Schedule global position rejected</p> <p>At the timeseries level:</p> <p>A20 = Time series fully rejected</p> <p>A63 = Time series modified</p> <p>At the time interval level:</p> <p>A43 = Quantity increased</p> <p>A44 = Quantity decreased</p> <p>Other codes defined in the ENTSO-E Code List of Reason Codes may be used as required by local market rules</p>
	Text	Used
Point	position	Used
	quantity	Used

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338 **5.9 ReserveAllocationResult\_MarketDocument Dependency Table**

339

ReserveAllocationResult_MarketDocument		
Class	Attribute	Confirmed Contracted Reserves
Reserve Allocation Result_ Market Document	mRID	Used
	revisionNumber	Used
	type	Used
	process.processType	<p>A27 = Reserve resource process.</p> <p>A28 = Primary reserve process</p> <p>A29 = Secondary reserve process</p>

		<p>A30 = Tertiary reserve process</p> <p>A46 = Replacement Reserve<sup>12</sup></p> <p>A47 = Manual Frequency Restoration Reserve</p> <p>A51 = Automatic Frequency Restoration Reserve</p> <p>A52 = Frequency Containment Reserve</p>
	sender.mRID	EIC code of the “Acquiring” System Operator
	sender.marketRole.type	A04: System Operator
	receiver.mRID	EIC Code of the MOL Responsible
	receiver.marketRole.type	A35: MOL Responsible
	createdDateTime	Used. YYYY-MM-DDTHH:MM:SSZ
	reserveBid_Period.timeinterval	Used. YYYY-MM-DDTHH:MMZ/YYYY-MM-DDTHH:MMZ
	domain.mRID	Used
TimeSeries	mRID	Used
	bid_Original.mRID	Dependent on local market rules
	bid_Original.revisionNumber	Dependent on local market rules
	bid_Original.bid_BidTimeSeries.mRID	Dependent on local market rules
	bid_Original.tendering.mRID	Dependent on local market rules
	auction.mRID	Dependent on local market rules
	businessType	Used
	acquiring_Domain.mRID	Used
	connecting_Domain.mRID	Used
	marketAgreement.type	Dependent on local market rules

<sup>12</sup> The Codes A46, A47, A51 and A52 are included for historical reason.

	marketAgreement.mRID	Dependent on local market rules
	marketAgreement.createdDate Time	Dependent on local market rules
	quantity_Measure_Unit.name	Used
	currency_Unit.name	Dependent on local market rules
	price_Measure_Unit.name	Dependent on local market rules
	energy_Measurement_Unit.name	Dependent on local market rules
	registeredResource.mRID	Dependent on local market rules
	flowDirection.direction	<p>A01 = UP, this signifies that the available power can be used by the Acquiring area to increase energy.</p> <p>A02 = DOWN, this signifies that the available power can be used by the Acquiring area to decrease energy.</p> <p>A03 = UP and DOWN, this signifies that the UP and Down values are equal.</p>
	minimumActivation_Quantity.quantity	Dependent on local market rules
	stepIncrement_Quantity.quantity	Dependent on local market rules
	orderNumber_AttributeInstanceComponent.position	Dependent on local market rules
	activation_ConstraintDuration	Dependent on local market rules
	resting_ConstraintDuration.duration	Dependent on local market rules
	minimum_ConstraintDuration.duration	Dependent on local market rules
	maximum_ConstraintDuration.duration	Dependent on local market rules
	curveType	Used
Series_	timeInterval	Used

Period	Resolution: Duration	Used. YYYY-MM-DDTHH:MMZ/YYYY-MM-DDTHH:MMZ
Point	position	Used
	quantity	Used
	price.amount	Dependent on local market rules
	secondaryQuantity	Dependent on local market rules
	bid_Price.amount	Dependent on local market rules
	bidEnergy_Price.amount	Dependent on local market rules
	energy_Price.amount	Dependent on local market rules
Reason	Code	<p>A71 = Linked bid rejected due to associated bid unsuccessful</p> <p>A72 = Original bid divided to permit acceptance</p> <p>A73 = Tender in question has been accepted</p> <p>A74 = Auction Status</p> <p>B09 = Bid not accepted</p>
	Text	Used

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