



NUCS

aFRR / mFRR API

Functional Specification



Statnett

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1 Version History

Version	Date	Author	Description
0.01	23 rd August 2023	Barbora Kánská	Creation of the document
0.02	8 th January 2024	Barbora Kánská	Document revision & updates, addition of DI 12.3.e, 17.1.f / 17.2.e, 17.1.g / 17.2.f

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3 Glossary

Term / Abbreviation	Description

4 Solution Description

Field Code Changed

4.1 API Documentation

4.1.1 DF09 – 17.1.b: Amount of Balancing Reserves Under Contract – Attributes

AttributeInstanceComponent	Description
DocumentType [1..1]	A81 = Contracted reserves
Type_marketagreement.type [1..1]	A01 = Daily A02 = Weekly A03 = Monthly A04 = Yearly A06 = Long term contract A13 = Hourly
BusinessType [1..1]	A96 = aFRR A97 = mFRR
TimeInterval [0..1]	Time interval in UTC time zone. <i>Mandatory if combination of PeriodStart and PeriodEnd is not used. There is no limit to the entered time interval. Instead, the output is limited to a number of documents specified in the application configuration. Any time interval exceeding the given number of documents will return an error.</i>
PeriodStart [0..1]	<i>Mandatory if TimeInterval is not used.</i>
PeriodEnd [0..1]	<i>Mandatory if TimeInterval is not used.</i>
ControlArea_domain [1..1]	EIC code of the area for which the reserves are allocated

4.1.2 DF09 – 17.1.b: Amount of Balancing Reserves Under Contract – Example

```

<Balancing_MarketDocument xmlns="urn:iec62325.351:tc57wg16:451-6:balancingdocument:3:0">
  <mRID>9_20230421_DK1_0006773843</mRID>
  <revisionNumber>20</revisionNumber>
  <type>A81</type>
  <process.processType>A34</process.processType>
  <sender_MarketParticipant.mRID codingScheme="A01">10V1001C--000284</sender_MarketParticipant.mRID>
  <sender_MarketParticipant.marketRole.type>A34</sender_MarketParticipant.marketRole.type>
  <receiver_MarketParticipant.mRID codingScheme="A01">10V1001C--000187</receiver_MarketParticipant.mRID>
  <receiver_MarketParticipant.marketRole.type>A32</receiver_MarketParticipant.marketRole.type>
  <createdDateTime>2023-04-19T11:22:51Z</createdDateTime>
  <controlArea_Domain.mRID codingScheme="A01">10YDK-1-----W</controlArea_Domain.mRID>
  <period.timeInterval>
    <start>2023-04-20T22:00Z</start>
    <end>2023-04-21T22:00Z</end>
  </period.timeInterval>
  <TimeSeries>
    <mRID>MCJ5FVs1ly04H0eg9KDnPSUdkI</mRID>
    <businessType>A97</businessType>
    <type_MarketAgreement.type>A01</type_MarketAgreement.type>
    <mktPSRTType.psrType>A03</mktPSRTType.psrType>
    <flowDirection.direction>A01</flowDirection.direction>
    <quantity_Measure_Unit.name>MAW</quantity_Measure_Unit.name>
    <curveType>A01</curveType>
  
```

```

<Period>
  <timeInterval>
    <start>2023-04-20T22:00Z</start>
    <end>2023-04-21T22:00Z</end>
  </timeInterval>
  <resolution>PT60M</resolution>
  <Point>
    <position>1</position>
    <quantity>1</quantity>
  </Point>
</Period>
</TimeSeries>
</Balancing_MarketDocument>

```

4.1.3 DF11 – 17.1.c: Prices of Procured Balancing Reserves – Attributes

AttributeInstanceComponent	Description
DocumentType [1..1]	A89 = Contracted reserve prices
Type_marketagreement.type [1..1]	A01 = Daily A02 = Weekly A03 = Monthly A04 = Yearly A06 = Long term contract A13 = Hourly
BusinessType [1..1]	A96 = aFRR A97 = mFRR
TimeInterval [0..1]	Time interval in UTC time zone. <i>Mandatory if combination of PeriodStart and PeriodEnd is not used.</i> <i>There is no limit to the entered time interval. Instead, the output is limited to a number of documents specified in the application configuration. Any time interval exceeding the given number of documents will return an error.</i>
PeriodStart [0..1]	<i>Mandatory if TimeInterval is not used.</i>
PeriodEnd [0..1]	<i>Mandatory if TimeInterval is not used.</i>
ControlArea_domain [1..1]	EIC code of the area for which the reserves are allocated

4.1.4 DF11 – 17.1.c: Prices of Procured Balancing Reserves – Example

```

<Balancing_MarketDocument xmlns="urn:iec62325.351:tc57wg16:451-6:balancingdocument:3:0">
  <mRID>11_20230421_DK1_0006773843</mRID>
  <revisionNumber>20</revisionNumber>
  <type>A89</type>
  <process.processType>A34</process.processType>
  <sender_MarketParticipant.mRID codingScheme="A01">10V1001C--000284</sender_MarketParticipant.mRID>
  <sender_MarketParticipant.marketRole.type>A34</sender_MarketParticipant.marketRole.type>
  <receiver_MarketParticipant.mRID codingScheme="A01">10V1001C--000187</receiver_MarketParticipant.mRID>
  <receiver_MarketParticipant.marketRole.type>A32</receiver_MarketParticipant.marketRole.type>
  <createdDateTime>2023-04-19T11:22:51Z</createdDateTime>
  <controlArea_Domain.mRID codingScheme="A01">10YDK-1-----W</controlArea_Domain.mRID>
  <period.timeInterval>
    <start>2023-04-20T22:00Z</start>

```

```

<end>2023-04-21T22:00Z</end>
</period.timeInterval>
<TimeSeries>
  <mRID>3uB77fPpI7n71LxQMOpz1Nxgs</mRID>
  <businessType>A97</businessType>
  <type_MarketAgreement.type>A01</type_MarketAgreement.type>
  <flowDirection.direction>A01</flowDirection.direction>
  <currency_Unit.name>EUR</currency_Unit.name>
  <quantity_Measure_Unit.name>MAW</quantity_Measure_Unit.name>
  <price_Measure_Unit.name>MAW</price_Measure_Unit.name>
  <curveType>A01</curveType>
  <Period>
    <timeInterval>
      <start>2023-04-20T22:00Z</start>
      <end>2023-04-21T22:00Z</end>
    </timeInterval>
    <resolution>PT60M</resolution>
    <Point>
      <position>1</position>
      <procurement_Price.amount>333</procurement_Price.amount>
    </Point>
  </Period>
</TimeSeries>
</Balancing_MarketDocument>

```

4.1.5 DF14 – 12.3.f: Procured Balancing Capacity – Attributes

AttributeInstanceComponent	Description
DocumentType [1..1]	A15 = Acquiring System Operator Reserve Schedule
ProcessType [1..1]	A47 = mFRR A51 = aFRR
TimeInterval [0..1]	Time interval in UTC time zone. <i>Mandatory if combination of PeriodStart and PeriodEnd is not used.</i> <i>There is no limit to the entered time interval. Instead, the output is limited to a number of documents specified in the application configuration. Any time interval exceeding the given number of documents will return an error.</i>
PeriodStart [0..1]	<i>Mandatory if TimeInterval is not used.</i>
PeriodEnd [0..1]	<i>Mandatory if TimeInterval is not used.</i>
ControlArea_domain [1..1]	EIC code of the area for which the reserves are allocated

4.1.6 DF14 – 12.3.f: Procured Balancing Capacity – Example

```

<Balancing_MarketDocument xmlns="urn:iec62325.351:tc57wg16:451-6:balancingdocument:4:0">
  <mRID>14_20230422_FI_0006222609</mRID>
  <revisionNumber>20</revisionNumber>
  <type>A15</type>
  <process.processType>A51</process.processType>
  <sender_MarketParticipant.mRID codingScheme="A01">10V1001C--000284</sender_MarketParticipant.mRID>
  <sender_MarketParticipant.marketRole.type>A04</sender_MarketParticipant.marketRole.type>
  <receiver_MarketParticipant.mRID codingScheme="A01">10V1001C--000187</receiver_MarketParticipant.mRID>
  <receiver_MarketParticipant.marketRole.type>A32</receiver_MarketParticipant.marketRole.type>
  <createdDateTime>2023-04-15T07:43:57Z</createdDateTime>

```

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```
<controlArea_Domain.mRID codingScheme="A01">10YFI-1-----U</controlArea_Domain.mRID>
<period.timeInterval>
  <start>2023-04-21T22:00Z</start>
  <end>2023-04-22T22:00Z</end>
</period.timeInterval>
<TimeSeries>
  <mRID>jsm0KeJDzeEtzNnZteZ7pQ4SG0E</mRID>
  <businessType>B95</businessType>
  <type_MarketAgreement.type>A01</type_MarketAgreement.type>
  <original_MarketProduct.marketProductType>A02</original_MarketProduct.marketProductType>
  <flowDirection.direction>A02</flowDirection.direction>
  <currency_Unit.name>EUR</currency_Unit.name>
  <quantity_Measure_Unit.name>MAW</quantity_Measure_Unit.name>
  <price_Measure_Unit.name>MAW</price_Measure_Unit.name>
  <curveType>A01</curveType>
  <Period>
    <timeInterval>
      <start>2023-04-22T02:00Z</start>
      <end>2023-04-22T03:00Z</end>
    </timeInterval>
    <resolution>PT60M</resolution>
    <Point>
      <position>1</position>
      <quantity>25</quantity>
      <procurement_Price.amount>6.5</procurement_Price.amount>
    </Point>
  </Period>
</TimeSeries>
</Balancing_MarketDocument>
```

4.1.7 DF16+DF28 – 12.3.h+i: Use of Cross-zonal Balancing Capacities & Allocated Cross-zonal Balancing Capacity – Attributes

AttributeInstanceComponent	Description
DocumentType [1..1]	A38 = Reserve Allocation Result Document
ProcessType [1..1]	A47 = mFRR A51 = aFRR
TimeInterval [0..1]	Time interval in UTC time zone. <i>Mandatory if combination of PeriodStart and PeriodEnd is not used.</i> <i>There is no limit to the entered time interval. Instead, the output is limited to a number of documents specified in the application configuration. Any time interval exceeding the given number of documents will return an error.</i>
PeriodStart [0..1]	<i>Mandatory if TimeInterval is not used.</i>
PeriodEnd [0..1]	<i>Mandatory if TimeInterval is not used.</i>
Acquiring_Domain [1..1]	EIC code of the area to which the expected balancing flow is imported
Connecting_Domain [1..1]	EIC code of the area from which the expected balancing flow is exported

4.1.8 DF16+DF28 – 12.3.h+i: Use of Cross-zonal Balancing Capacities & Allocated Cross-zonal Balancing Capacity – Example

```
<Balancing_MarketDocument xmlns="urn:iec62325.351:tc57wg16:451-6:balancingdocument:4:1">
```

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```
<mRID>16_20230422_0006222609</mRID>
<revisionNumber>20</revisionNumber>
<type>A38</type>
<process.processType>A51</process.processType>
<sender_MarketParticipant.mRID codingScheme="A01">10V1001C--000284</sender_MarketParticipant.mRID>
<sender_MarketParticipant.marketRole.type>A04</sender_MarketParticipant.marketRole.type>
<receiver_MarketParticipant.mRID codingScheme="A01">10V1001C--000187</receiver_MarketParticipant.mRID>
<receiver_MarketParticipant.marketRole.type>A32</receiver_MarketParticipant.marketRole.type>
<createdDateTime>2023-04-15T07:43:56Z</createdDateTime>
<area_Domain.mRID codingScheme="A01">10Y1001A1001A91G</area_Domain.mRID>
<allocationDecision_DateAndOrTime.dateTime>2023-04-15T07:43:40Z</allocationDecision_DateAndOrTime.dateTime>
<period.timeInterval>
  <start>2023-04-21T22:00Z</start>
  <end>2023-04-22T22:00Z</end>
</period.timeInterval>
<TimeSeries>
  <mRID>Hz5hKANKAy5CHPG5CpVQQzZ8iJA</mRID>
  <businessType>A48</businessType>
  <acquiring_Domain.mRID codingScheme="A01">10Y1001A1001A44P</acquiring_Domain.mRID>
  <connecting_Domain.mRID codingScheme="A01">10YFI-1-----U</connecting_Domain.mRID>
  <type_MarketAgreement.type>A01</type_MarketAgreement.type>
  <currency_Unit.name>EUR</currency_Unit.name>
  <curveType>A01</curveType>
  <Period>
    <timeInterval>
      <start>2023-04-21T22:00Z</start>
      <end>2023-04-22T22:00Z</end>
    </timeInterval>
    <resolution>PT60M</resolution>
    <Point>
      <position>1</position>
      <procurement_Price.amount>100</procurement_Price.amount>
    </Point>
  </Period>
</TimeSeries>
<TimeSeries>
  <mRID>sYc1R3D5KQbx8xMeAYqqr7gqck</mRID>
  <businessType>A41</businessType>
  <acquiring_Domain.mRID codingScheme="A01">10Y1001A1001A47J</acquiring_Domain.mRID>
  <connecting_Domain.mRID codingScheme="A01">10YDK-2-----M</connecting_Domain.mRID>
  <type_MarketAgreement.type>A01</type_MarketAgreement.type>
  <quantity_Measure_Unit.name>MAW</quantity_Measure_Unit.name>
  <curveType>A01</curveType>
  <Period>
    <timeInterval>
      <start>2023-04-21T22:00Z</start>
      <end>2023-04-22T22:00Z</end>
    </timeInterval>
    <resolution>PT60M</resolution>
    <Point>
      <position>1</position>
      <quantity>0</quantity>
    </Point>
  </Period>
</TimeSeries>
</Balancing_MarketDocument>
```

4.1.9 DF18 – 12.1.c: Maximum Transfer Capacity – Attributes

AttributeInstanceComponent	Description
DocumentType [1..1]	A26 = Capacity document
ProcessType [1..1]	A47 = mFRR A51 = aFRR
BusinessType [0..1]	A31 = Offered capacity A27 = Net transmission capacity <i>Optional. If not used, both will be returned.</i>
TimeInterval [0..1]	Time interval in UTC time zone. Maximum allowed time interval is 370 days. <i>Mandatory if combination of PeriodStart and PeriodEnd is not used.</i>
PeriodStart [0..1]	<i>Mandatory if TimeInterval is not used.</i>
PeriodEnd [0..1]	<i>Mandatory if TimeInterval is not used.</i>
In_Domain [1..1]	EIC code of the area to which the expected balancing flow is imported
Out_Domain [1..1]	EIC code of the area from which the expected balancing flow is exported

4.1.10 DF18 – 12.1.c: Maximum Transfer Capacity – Example

```
<Capacity_MarketDocument xmlns="urn:iec62325.351:tc57wg16:451-3:capacitydocument:8:0">
  <mRID>9960100020039397</mRID>
  <revisionNumber>20</revisionNumber>
  <type>A26</type>
  <process.processType>A51</process.processType>
  <sender_MarketParticipant.mRID codingScheme="A01">10V1001C--000284</sender_MarketParticipant.mRID>
  <sender_MarketParticipant.marketRole.type>A34</sender_MarketParticipant.marketRole.type>
  <receiver_MarketParticipant.mRID codingScheme="A01">10V1001C--000187</receiver_MarketParticipant.mRID>
  <receiver_MarketParticipant.marketRole.type>A32</receiver_MarketParticipant.marketRole.type>
  <createdDateTime>2023-04-15T07:44:24Z</createdDateTime>
  <period.timeInterval>
    <start>2023-04-21T22:00Z</start>
    <end>2023-04-22T22:00Z</end>
  </period.timeInterval>
  <domain.mRID codingScheme="A01">10Y1001A1001A91G</domain.mRID>
  <TimeSeries>
    <mRID>oF0717SbLHJ8Ii1PpKPxWB7Cbh8</mRID>
    <businessType>A31</businessType>
    <product>8716867000016</product>
    <in_Domain.mRID codingScheme="A01">10Y1001A1001A44P</in_Domain.mRID>
    <out_Domain.mRID codingScheme="A01">10YFI-1-----U</out_Domain.mRID>
    <measure_Unit.name>MWh</measure_Unit.name>
    <auction.mRID>AFRR_CAPACITY_MARKET</auction.mRID>
    <curveType>A01</curveType>
    <Period>
      <timeInterval>
        <start>2023-04-21T22:00Z</start>
        <end>2023-04-22T22:00Z</end>
      </timeInterval>
      <resolution>PT60M</resolution>
      <Point>
        <position>1</position>
```



```

<quantity>123</quantity>
</Point>
</Period>
</TimeSeries>
</Capacity_MarketDocument>

```

4.1.11 DF19 – 12.1.d: Daily Price Differences Between Areas – Attributes

AttributeInstanceComponent	Description
DocumentType [1..1]	A44 = Price Document
ProcessType [1..1]	A47 = mFRR A51 = aFRR
TimeInterval [0..1]	Time interval in UTC time zone. Maximum allowed time interval is 370 days. <i>Mandatory if combination of PeriodStart and PeriodEnd is not used.</i>
PeriodStart [0..1]	<i>Mandatory if TimeInterval is not used.</i>
PeriodEnd [0..1]	<i>Mandatory if TimeInterval is not used.</i>
Acquiring_Domain [1..1]	EIC code of the area to which the expected balancing flow is imported
Connecting_Domain [1..1]	EIC code of the area from which the expected balancing flow is exported

4.1.12 DF19 – 12.1.d: Daily Price Differences Between Areas – Example

```

<Balancing_MarketDocument xmlns="urn:iec62325.351:tc57wg16:451-6:balancingdocument:4:0">
  <mRID>99601000020038467</mRID>
  <revisionNumber>20</revisionNumber>
  <type>A44</type>
  <process><processType>A51</processType>
    <sender><MarketParticipant><mRID>codingScheme="A01">10V1001C--000284</mRID></sender>
    <sender><MarketParticipant><mRID>codingScheme="A01">10V1001C--000284</mRID></sender>
    <receiver><MarketParticipant><mRID>codingScheme="A01">10V1001C--000187</mRID></receiver>
    <receiver><MarketParticipant><mRID>codingScheme="A01">10Y1001A1001A91G</mRID></receiver>
  </process>
  <period><timeInterval>
    <start>2023-04-21T22:00Z</start>
    <end>2023-04-22T22:00Z</end>
  </timeInterval>
  <TimeSeries>
    <mRID>a4GFeFxKmp28LIVNmVfTdrMPCyw</mRID>
    <businessType>B04</businessType>
    <acquiring_Domain><mRID>codingScheme="A01">10Y1001A1001A44P</mRID></acquiring_Domain>
    <connecting_Domain><mRID>codingScheme="A01">10YFI-1-----U</mRID></connecting_Domain>
    <type><MarketAgreement><type>A01</type></MarketAgreement></type>
    <currency_Units><name>EUR</name></currency_Units>
    <price_Measure_Units><name>MAW</name></price_Measure_Units>
    <curveType>A01</curveType>
  </TimeSeries>
  <Period>
    <timeInterval>
      <start>2023-04-21T22:00Z</start>
      <end>2023-04-22T22:00Z</end>
    </timeInterval>
  </Period>
</Balancing_MarketDocument>

```

```

<resolution>PT60M</resolution>
<Point>
  <position>1</position>
  <procurement_Price.amount>1.1</procurement_Price.amount>
</Point>
</Period>
</TimeSeries>
</Balancing_MarketDocument>

```

4.1.13 DF29 – 17.1.b+c: Amount of Balancing Reserves Under Contract & Prices of Procured Balancing Reserves – Attributes

AttributeInstanceComponent	Description
DocumentType [1..1]	A81 = Contracted reserves
ProcessType [1..1]	A47 = mFRR A51 = aFRR
Type_marketagreement.type [1..1]	A01 = Daily A02 = Weekly A03 = Monthly A04 = Yearly A06 = Long term contract A13 = Hourly
TimeInterval [0..1]	Time interval in UTC time zone. <i>Mandatory if combination of PeriodStart and PeriodEnd is not used.</i> <i>There is no limit to the entered time interval. Instead, the output is limited to a number of documents specified in the application configuration. Any time interval exceeding the given number of documents will return an error.</i>
PeriodStart [0..1]	<i>Mandatory if TimeInterval is not used.</i>
PeriodEnd [0..1]	<i>Mandatory if TimeInterval is not used.</i>
ControlArea_domain [1..1]	EIC code of the area for which the reserves are allocated

4.1.14 DF29 – 17.1.b+c: Amount of Balancing Reserves Under Contract & Prices of Procured Balancing Reserves – Example

```

<Balancing_MarketDocument xmlns="urn:iec62325.351:tc57wg16:451-6:balancingdocument:4:5">
  <mRID>29_20240102_N04_0006263990</mRID>
  <revisionNumber>10</revisionNumber>
  <type>A81</type>
  <process.processType>A47</process.processType>
  <sender_MarketParticipant.mRID codingScheme="A01">10V1001C--000284</sender_MarketParticipant.mRID>
  <sender_MarketParticipant.marketRole.type>A34</sender_MarketParticipant.marketRole.type>
  <receiver_MarketParticipant.mRID codingScheme="A01">10V1001C--000187</receiver_MarketParticipant.mRID>
  <receiver_MarketParticipant.marketRole.type>A32</receiver_MarketParticipant.marketRole.type>
  <createdDateTime>2023-05-11T08:13:54Z</createdDateTime>
  <area_Domain.mRID codingScheme="A01">10YNO-4-----9</area_Domain.mRID>
  <allocationDecision_DateAndOrTime.dateTime>2023-05-11T08:13:47Z</allocationDecision_DateAndOrTime.dateTime>
  <period.timeInterval>
    <start>2024-01-01T23:00Z</start>
    <end>2024-01-02T23:00Z</end>
  </period.timeInterval>
</Balancing_MarketDocument>

```

```

</period.timeInterval>
<TimeSeries>
  <mRID>oVqME19MvjYhvCRbZoJniGa3FxM</mRID>
  <businessType>B95</businessType>
  <type_MarketAgreement.type>A01</type_MarketAgreement.type>
  <mktPSRTType.psrType>A03</mktPSRTType.psrType>
  <flowDirection.direction>A01</flowDirection.direction>
  <currency_Unit.name>EUR</currency_Unit.name>
  <quantity_Measurement_Unit.name>MAW</quantity_Measurement_Unit.name>
  <price_Measurement_Unit.name>MAW</price_Measurement_Unit.name>
  <curveType>A01</curveType>
  <Period>
    <timeInterval>
      <start>2024-01-01T23:00Z</start>
      <end>2024-01-02T23:00Z</end>
    </timeInterval>
    <resolution>PT60M</resolution>
  <Point>
    <position>1</position>
    <quantity>0</quantity>
    <procurement_Price.amount>0</procurement_Price.amount>
  </Point>
  </Period>
</TimeSeries>
</Balancing_MarketDocument>

```

4.1.15 12.3.e: Aggregated Balancing Energy Bids – Attributes

AttributeInstanceComponent	Description
DocumentType [1..1]	A24 = Bid document
ProcessType [1..1]	A47 = mFRR A60 = Scheduled activation mFRR A61 = Direct activation mFRR
TimeInterval [0..1]	Time interval in UTC time zone. Maximum allowed time interval is 200 days. <i>Mandatory if combination of PeriodStart and PeriodEnd is not used.</i>
PeriodStart [0..1]	<i>Mandatory if TimeInterval is not used.</i>
PeriodEnd [0..1]	<i>Mandatory if TimeInterval is not used.</i>
ControlArea_domain [1..1]	EIC code of the area for which the reserves are allocated

4.1.16 12.3.e: Aggregated Balancing Energy Bids – Example

```

<Balancing_MarketDocument xmlns="urn:iec62325.351:tc57wg16:451-6:balancingdocument:4:1">
  <mRID>9b312b6212f949548b800f8bd78d6f2</mRID>
  <revisionNumber>1</revisionNumber>
  <type>A24</type>
  <process.processType>A61</process.processType>
  <sender_MarketParticipant.mRID codingScheme="A01">10V1001C--000187</sender_MarketParticipant.mRID>
  <sender_MarketParticipant.marketRole.type>A32</sender_MarketParticipant.marketRole.type>
  <receiver_MarketParticipant.mRID codingScheme="A01">10X1001A1001A38Y</receiver_MarketParticipant.mRID>
  <receiver_MarketParticipant.marketRole.type>A33</receiver_MarketParticipant.marketRole.type>
  <createdDateTime>2023-12-04T10:36:45Z</createdDateTime>
  <area_Domain.mRID codingScheme="A01">10YDK-1-----W</area_Domain.mRID>

```

```

<period.timeInterval>
  <start>2022-05-24T08:00Z</start>
  <end>2022-05-24T08:15Z</end>
</period.timeInterval>
<TimeSeries>
  <mRID>1</mRID>
  <businessType>A14</businessType>

<standard_MarketProduct.marketProductType>A01</standard_MarketProduct.marketProductType>
  <flowDirection.direction>A02</flowDirection.direction>
  <quantity_Measure_Unit.name>MAW</quantity_Measure_Unit.name>
  <curveType>A01</curveType>
  <Period>
    <timeInterval>
      <start>2022-05-24T08:00Z</start>
      <end>2022-05-24T08:15Z</end>
    </timeInterval>
    <resolution>PT15M</resolution>
    <Point>
      <position>1</position>
      <secondaryQuantity>60</secondaryQuantity>
    </Point>
  </Period>
</TimeSeries>
</Balancing_MarketDocument>

```

4.1.17 17.1.f / 17.2.e: Clearing Prices – Attributes

AttributeInstanceComponent	Description
ProcessType [1..1]	A16 = Realised
BusinessType [1..1]	A97 = mFRR
TimeInterval [0..1]	Time interval in UTC time zone. Maximum allowed time interval is 200 days. <i>Mandatory if combination of PeriodStart and PeriodEnd is not used.</i>
PeriodStart [0..1]	<i>Mandatory if TimeInterval is not used.</i>
PeriodEnd [0..1]	<i>Mandatory if TimeInterval is not used.</i>
ControlArea_domain [1..1]	EIC code of the area for which the reserves are allocated

4.1.18 17.1.f / 17.2.e: Clearing Prices – Example

```

<Balancing_MarketDocument xmlns="urn:iec62325.351:tc57wg16:451-6:balancingdocument:4:1">
  <mRID>8eff7212a1c648c980ffd23a78998fa4</mRID>
  <revisionNumber>1</revisionNumber>
  <type>A84</type>
  <process.processType>A16</process.processType>
  <sender_MarketParticipant.mRID codingScheme="A01">10V1001C--000187</sender_MarketParticipant.mRID>
  <sender_MarketParticipant.marketRole.type>A32</sender_MarketParticipant.marketRole.type>
  <receiver_MarketParticipant.mRID codingScheme="A01">10X1001A1001A38Y</receiver_MarketParticipant.mRID>
  <receiver_MarketParticipant.marketRole.type>A33</receiver_MarketParticipant.marketRole.type>
  <createdDateTime>2024-01-05T10:53:40Z</createdDateTime>
    <area_Domain.mRID codingScheme="A01">10YDK-1-----W</area_Domain.mRID>
<period.timeInterval>
  <start>2022-05-24T08:00Z</start>
  <end>2022-05-24T09:00Z</end>

```

```

</period.timeInterval>
<TimeSeries>
  <mRID>1</mRID>
  <businessType>A97</businessType>
    <flowDirection.direction>A02</flowDirection.direction>
    <currency_Unit.name>EUR</currency_Unit.name>
    <price_Measure_Unit.name>MWH</price_Measure_Unit.name>
    <curveType>A01</curveType>
    <Period>
      <timeInterval>
        <start>2022-05-24T08:00Z</start>
        <end>2022-05-24T09:00Z</end>
      </timeInterval>
      <resolution>PT60M</resolution>
      <Point>
        <position>1</position>
        <activation_Price.amount>88.15</activation_Price.amount>
        <imbalance_Price.category>A06</imbalance_Price.category>
      </Point>
    </Period>
  </TimeSeries>
</Balancing_MarketDocument>

```

4.1.19 17.1.g / 17.2.f: Imbalance Price – Attributes

AttributeInstanceComponent	Description
ProcessType [1..1]	A16 = Realised
BusinessType [1..1]	A19 = Balance energy deviation
TimeInterval [0..1]	Time interval in UTC time zone. Maximum allowed time interval is 200 days. <i>Mandatory if combination of PeriodStart and PeriodEnd is not used.</i>
PeriodStart [0..1]	<i>Mandatory if TimeInterval is not used.</i>
PeriodEnd [0..1]	<i>Mandatory if TimeInterval is not used.</i>
ControlArea_domain [1..1]	EIC code of the area for which the reserves are allocated

4.1.20 17.1.g / 17.2.f: Imbalance Price – Example

```

<Balancing_MarketDocument xmlns="urn:iec62325.351:tc57wg16:451-6:balancingdocument:4:4">
  <mRID>feb5f11c280d4a4ca181a875b5fd3397</mRID>
  <revisionNumber>1</revisionNumber>
  <type>A85</type>
  <process.processType>A16</process.processType>
  <sender_MarketParticipant.mRID codingScheme="A01">10V1001C--000187</sender_MarketParticipant.mRID>
  <sender_MarketParticipant.marketRole.type>A32</sender_MarketParticipant.marketRole.type>
  <receiver_MarketParticipant.mRID codingScheme="A01">10X1001A1001A38Y</receiver_MarketParticipant.mRID>
  <receiver_MarketParticipant.marketRole.type>A33</receiver_MarketParticipant.marketRole.type>
  <createdDateTime>2024-01-08T08:43:32Z</createdDateTime>
  <area_Domain.mRID codingScheme="A01">10YDK-1-----W</area_Domain.mRID>
  <period.timeInterval>
    <start>2023-05-24T08:00Z</start>
    <end>2023-05-24T09:00Z</end>
  </period.timeInterval>
</Balancing_MarketDocument>

```



```

<TimeSeries>
    <mRID>1</mRID>
    <businessType>A19</businessType>
    <currency_Unit.name>EUR</currency_Unit.name>
    <price_Measure_Unit.name>MWh</price_Measure_Unit.name>
    <curveType>A01</curveType>
    <Period>
        <timeInterval>
            <start>2023-05-24T08:00Z</start>
            <end>2023-05-24T09:00Z</end>
        </timeInterval>
        <resolution>PT60M</resolution>
        <Point>
            <position>1</position>
            <imbalance_Price.amount>222.11</imbalance_Price.amount>
            <imbalance_Price.category>A04</imbalance_Price.category>
            <Financial_Price>
                <amount>15.00</amount>
                <priceDescriptor.type>A02</priceDescriptor.type>
            </Financial_Price>
        </Point>
    </Period>
</TimeSeries>
<TimeSeries>
    <mRID>2</mRID>
    <businessType>A19</businessType>
    <currency_Unit.name>EUR</currency_Unit.name>
    <price_Measure_Unit.name>MWh</price_Measure_Unit.name>
    <curveType>A01</curveType>
    <Period>
        <timeInterval>
            <start>2023-05-24T08:00Z</start>
            <end>2023-05-24T09:00Z</end>
        </timeInterval>
        <resolution>PT60M</resolution>
        <Point>
            <position>1</position>
            <imbalance_Price.amount>222.11</imbalance_Price.amount>
            <imbalance_Price.category>A05</imbalance_Price.category>
            <Financial_Price>
                <amount>15.00</amount>
                <priceDescriptor.type>A02</priceDescriptor.type>
            </Financial_Price>
        </Point>
    </Period>
</TimeSeries>
</Balancing_MarketDocument>

```

4.2 API Example Scenarios

4.2.1 aFRR: DF11 – 17.1.b (Amount of Balancing Reserves Under Contract)

1. Perform a query for aFRR DF11 – 17.1.b (Amount of Balancing Reserves Under Contract) data reported on the DK1 bidding zone with the *daily* type of contract for a specific time interval.

https://<NUCS>/api?securityToken=<MYTOKEN>&documentType=A81&type_marketagreement.type=A01&businessType=A96&controlArea_domain=10YDK-1-----W&periodStart=202304202200&periodEnd=202304212200

2. API responds with one XML document.



4.2.2 aFRR: DF14 – 12.3.f (Procured Balancing Capacity)

1. Perform a query for aFRR: DF14 – 12.3.f (Procured Balancing Capacity) data reported on the DK2 bidding zone for a specific time interval.
`https://<NUCS>/api?securityToken=<MYTOKEN>&documentType=A15&processType=A51&controlArea_domain=10YDK-2-----M&periodStart=202306212200&periodEnd=202306222200`
2. API responds with one XML document.

4.2.3 mFRR: DF16+DF28 – 12.3.h+i (Use of Cross-zonal Balancing Capacities & Allocated Cross-zonal Balancing Capacity)

1. Perform a query for mFRR: DF16+DF28 – 12.3.h+i (Use of Cross-zonal Balancing Capacities & Allocated Cross-zonal Balancing Capacity) data reported on the DK1-DK2 border for a specific time interval.
`https://<NUCS>/api?securityToken=<MYTOKEN>&documentType=A38&processType=A47&acquiring_Domain=10YNO-2-----T&connecting_Domain=10YNO-1-----2&periodStart=202304212200&periodEnd=202304222200`
2. API responds with one XML document.

4.2.4 mFRR: DF18 – 12.1.c (Maximum Transfer Capacity)

1. Perform a query for mFRR: DF18 – 12.1.c (Maximum Transfer Capacity) data reported on the NO1A-NO1 border for a specific time interval.
`https://<NUCS>/api?securityToken=<MYTOKEN>&documentType=A26&processType=A47&businessType=A31&in_Domain=10Y1001A1001A64J&out_Domain=10YNO-1-----2&periodStart=202304212200&periodEnd=202304222200`
2. API responds with one XML document.

4.2.5 aFRR: DF19 – 12.1.d (Daily Price Differences Between Areas)

2. Perform a query for aFRR: DF19 – 12.1.d (Daily Price Differences Between Areas) data reported on the DK1-DK2 border for a specific time interval.
`https://<NUCS>/api?securityToken=<MYTOKEN>&documentType=A44&processType=A51&acquiring_Domain=10YDK-2-----M&connecting_Domain=10YDK-1-----W&timeInterval=2023-06-21T22:00Z/2023-06-22T22:00Z`
3. API responds with one XML document.

4.2.6 aFRR: DF29 – 17.1.b+c (Amount of Balancing Reserves Under Contract & Prices of Procured Balancing Reserves)

2. Perform a query for aFRR: 17.1.b+c (Amount of Balancing Reserves Under Contract & Prices of Procured Balancing Reserves) data reported on the DK1 bidding zone with the *hourly* type of contract for a specific time interval.
`https://<NUCS>/api?securityToken=<MYTOKEN>&documentType=A81&type_marketagreement.type=A13&processType=A51&controlArea_domain=10YDK-1-----W&periodStart=202304202200&periodEnd=202304212200`

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aFRR / mFRR API
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3. API responds with one XML document.

4.2.7 Direct mFRR: 12.3.e (Aggregated Balncing Energy Bids)

2. Perform a query for direct mFRR: 12.3.e (Aggregated Balncing Energy Bids) data reported on the DK1 bidding zone for a specific time interval.

`https://<NUCS>/api?securityToken=<MYTOKEN>&documentType=A24&controlArea_domain=10YDK-1-----W&processType=A61&timeInterval=2022-05-23T07:00Z/2022-05-24T07:15Z`

3. API responds with one XML document.

4.2.8 mFRR: 17.1.f / 17.2.e (Clearing Prices)

3. Perform a query for direct mFRR: 17.1.f / 17.2.e (Clearing Prices) data reported on the DK1 bidding zone for a specific time interval.

`https://<NUCS>/api?securityToken=<MYTOKEN>&controlArea_domain=10YDK-1-----W&processType=A16&businessType=A97&timeInterval=2022-05-24T07:00Z/2022-05-25T07:00Z`

4. API responds with one XML document.

4.2.9 mFRR: 17.1.g / 17.2.f (Imbalance Price)

4. Perform a query for direct mFRR: 17.1.g / 17.2.f (Imbalance Price) data reported on the DK1 bidding zone for a specific time interval.

`https://<NUCS>/api?securityToken=<MYTOKEN>&controlArea_domain=10YDK-1-----W&processType=A16&businessType=A19&timeInterval=2022-05-24T07:00Z/2022-05-25T07:00Z`

5. API responds with one XML document.

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