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# STEM & BILATERAL SUBMISSION SPECIFICATION

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**Version 1.1**

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# Important notice

## PURPOSE

AEMO has prepared this document to provide information about the STEM and Bilateral submission formats required to participate in the new Wholesale Electricity Market.

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## VERSION CONTROL

Version	Release date	Changes
0.1	06/06/2023	Initial release for Market Participant Test
0.2	22/08/2023	Added information pertaining to /trading API endpoint Comment on subsequent standing submissions
1.0	11/01/2024	AEMO recommends Participants set facility_type to NA in STEM submissions
1.1	27/06/2024	Correction to section 3.1.5

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# 1. Introduction

This document describes the file formats used for data exchange between Market Participants and AEMO through the WEMS. File Exchange facilitates the exchange of XML and CSV files for Bilateral and STEM, with functionality within the systems to allow users to perform submit and cancellation requests for each of these submission types. Bilateral and STEM submission types also allow the user to make query requests to view the current state of the submission.

## 2. Submission Format Details

### 2.1 XML Format

XML documents must conform to an XML schema definition file 'XSD file' (e.g. the mint.xsd) which is available separately to this document. The XSD file contains the formal definitions for XML document submission. This document describes the XML format in a less formal, but more descriptive manner.

A XSD schema file provides the formal XML specifications for submissions:

- For Bilateral and STEM submissions, this is the mint.xsd. The mint.xsd schema has not been altered from its form in the current market. Instead, validations have been amended to reflect relevant rule changes.

This document provides example XML files with references to relevant parts of the schemas. Standing submissions and variation submissions cannot be made within the same submission files and therefore separate uploads must be performed for these submissions.

#### 2.1.1 Common mint.xsd XML Elements

The mint.xsd file covers validation of Bilateral and STEM.

Submissions using the mint.xsd must have a root element of <bids\_offers> containing a single element of <market\_submit>, <market\_query> or <market\_cancel>.

This is shown in the examples below:

```
<?xml version="1.0" encoding="UTF-8"?>
<bids_offers>
<market_submit trading_date="2011-07-14" application_type="[APPLICATION TYPE]"
participant_name="[PARTICIPANT]" user_name="[USER NAME]">
  [SUBMISSION CONTENT]
</market_submit>
</bids_offers>
```

```
<?xml version="1.0" encoding="UTF-8"?>
<bids_offers>
<market_query trading_date="2011-07-14" application_type="[APPLICATION TYPE]"
participant_name="[PARTICIPANT]" user_name="[USER NAME]">
  [SUBMISSION CONTENT]
```

```
</market_query>
</bids_offers>
```

```
<?xml version="1.0" encoding="UTF-8"?>
<bids_offers>
<market_cancel trading_date="2011-07-14" application_type="[APPLICATION TYPE]"
participant_name="[PARTICIPANT NAME]" user_name="[USER NAME]">
  [SUBMISSION CONTENT]
</market_cancel>
</bids_offers>
```

The APPLICATION TYPE referenced in the above example varies depending on whether the submission is for Bilateral or STEM. The valid values are shown below:

SUBMISSION TYPE	APPLICATION TYPE
STEM	STEM
Bilateral	BILATERAL

The values for this attribute will be covered in the relevant section. Likewise, the submission content varies depending on the type of submission and will be covered in the relevant section.

The PARTICIPANT NAME referenced in the above example refers to the submitting market participant and is validated accordingly.

The USER NAME referenced in the above example refers to the submitting user for the market participant and is validated accordingly.

The top level elements must contain the trading date in the trading\_date attribute in 'YYYY-MM-DD' format. For a variation submission, this indicates the trading date on which the variation applies, while for a standing submission, this indicates the date on which the standing submission first applies.

### 2.1.2 Standing submissions in mint.xsd

When a submission is a standing submission, an XML element detailing the submission will be placed in an element. The submission content element (i.e. the top-level element in the SUBMISSION CONTENT placeholder in Section 2.1.1) must have the standing\_flag attribute set to true.

For example, a Bilateral submission may appear as follows:

```
<bilateral version_no="1.0" standing_flag="true">
```

A child element is required when the submission is a standing submission containing the standing submission details. These are defined in the standing element in the mint.xsd file, an example of which follows below.

```
<standing expiry_date="2011-11-22" type="ALL"/>
```

The details of the standing submission fields are given below:

ATTRIBUTE	ELEMENT	TYPE	CONSTRAINTS	COMMENTS
standing_flag	Submission specific element	Boolean	Not required, defaults to false if not present	Whether the submission is a standing submission (true) or a variation submission (false)

ATTRIBUTE	ELEMENT	TYPE	CONSTRAINTS	COMMENTS
expiry_date	standing	Date (YYYY-MM-DD)	Required if standing element is present and not required if cancelling a submission	Expiry of the standing submission
type	standing	String	Valid values: MON, TUE, WED, THU, FRI, SAT, SUN, ALL	The day on which the standing submission applies. ALL is for every day.

If a submission is a standing submission, the 'standing\_flag' must be set to the value 'true' and the 'type' and 'expiry\_date' columns populated with valid values. If the submission is a variation submission or a variation cancel submission, the 'standing\_flag' column must be omitted or set to the value 'false', and the 'type' and 'expiry\_date' values omitted. If subsequent standing submission data is received when AEMO already holds a standing submission for that Trading Day, then the original standing submission is updated, i.e. there can only be one standing submission.

To cancel a Standing Submission, the 'standing\_flag' must be set to 'true', 'type' must be specified and 'expiry\_date' must be omitted.

## 2.2 CSV Format

All CSV files will consist of a header line, followed by zero or more detail lines.

Depending on the type of submission being made, one or more of the files may be omitted. This will be documented in the specific CSV file format sections, where relevant. The header line of each individual CSV file must contain the comma-separated list of header field names. All fields that are defined for a CSV file format must be present and no fields may be omitted from the header.

All detail lines must contain exactly the same number of fields as specified in the header, i.e. no fields may be omitted in the detail lines, though field values may be omitted if the field is optional.

Standing submissions and variation submissions cannot be made in the same set of files, therefore separate files must be made for each type of submission.

### 2.2.1 Standing submissions in CSV

Standing submissions for CSV files that are the equivalent of XML files defined in mint.xsd (i.e. Bilateral and STEM submissions) have common fields, as shown below:

FIELD NAME	TYPE	CONSTRAINTS	COMMENTS
standing_flag	Boolean	Required	Whether the submission (true) is a standing, or (false) a variation submission
standing_day_type	String	Required if standing_flag = true	Valid values: 'MON', 'TUE', 'WED', 'THU', 'FRI', 'SAT', 'SUN' or 'ALL'
standing_expiry_date	Date (DD/MM/YYYY)	Required if standing_flag = true and action = "SUBMIT"	The date until which the standing submission is valid.

If a submission is a standing submission, the 'standing\_flag' must be set to the value 'true' and the 'standing\_day\_type' and 'standing\_expiry\_date' columns populated with valid values. If the submission is a variation submission or a variation cancel submission, the 'standing\_flag' column must be set to the value

'false' and the 'standing\_day\_type' and 'standing\_expiry\_date' values omitted. If subsequent standing submission data is received when AEMO already holds a standing submission for that Trading Day, then the original standing submission is updated, i.e. there can only be one standing submission.

To cancel a Standing Submission, the standing\_flag must be set to true, standing\_day\_type must be specified and standing\_expiry\_date must not be set.

## 2.3 XML and CSV Differences

The major difference between fields in XML and CSV submission is in the date format.

XML files require dates to be specified in ISO-8601 format of YYYY-MM-DD. This is the default date format of XML schema definitions (XSD files). CSV files are specified in DD/MM/YYYY format as this is a common format used in Microsoft Excel, which can be used to export CSV files.

XML functionality within the File Exchange covers the ability to submit, query or cancel for Bilateral and STEM. However, CSV functionality within the File Exchange only provides the ability to submit and cancel (for all files).

File Exchange can be made using either one XML file per submission, or one or more CSV files, depending on the submission type.

# 3. Bilateral

The bilateral submission allows participants to submit their bilateral levels for the trading day into the WEMS. Participants are also able to query and cancel submissions for an individual trading interval, or a range of trading intervals.

## 3.1 XML Format

The XML format is specified by mint.xsd.

The following table contains the details of the nesting structure of elements that comprise a bilateral submission, and the number of times that each element can occur within the context of its parent element.

### 3.1.1 Structure

ELEMENT	MINT.XSD TYPE	MIN	MAX
bilateral	BilateralWaSubmit	1	1
standing	StandingSubmit	0	1
trade_period	TradePeriod	1	48
trade_detail	TradeDetail	1	Unlimited

Attribute details are shown for each element that comprises a bilateral submission. The attributes of the standing element are not covered here, as this is detailed in Section 2.1.2.

### Bilateral Element

ATTRIBUTE	TYPE	CONSTRAINTS	COMMENTS
version_no	String	Required	Must be set to '1.0'
standing_flag	Boolean	Attribute not required if a variation submission	If true, there must be a standing element contained within the bilateral element – See Section 2.1.2

### Trade Period Element

ATTRIBUTE	TYPE	CONSTRAINTS	COMMENTS
start_hr	Integer	Required	Starting hour, between 0 and 23
start_int	Integer	Required	Starting interval within the start hour. Valid values: 1 and 2.
end_hr	Integer	Required	Ending hour, between 0 and 23
end_int	Integer	Required	Ending interval within the end hour. Valid values: 1 and 2.
supply_quantity_mwh	Number	Required	Quantity supplied for bilateral contracts (MWh). Clause of the WEM Rules 6.7.1 (c) i.
wp_load_mwh	Number	Required	Participants must specify a value of 0.

### Trade Detail Element

ATTRIBUTE	TYPE	CONSTRAINTS	COMMENTS
participant_name	String	Required	The name of the other participant in the bilateral contract Clause of the WEM Rules 6.7.1 (c) ii.
demand_quantity_mwh	Number	Required	The quantity of demand requested of the other participant (MWh). Clause of the WEM Rules 6.7.1 (c) iii.

### 3.1.2 Sample (Standing)

*This sample submission is for illustration purposes only.*

```
<?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
<bids_offers xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="mint.xsd">
  <market_submit trading_date="2011-05-07" application_type="BILATERAL"
participant_name="TESTGEN2" user_name="TESTUSER">
    <bilateral version_no="1.0" standing_flag="true">
      <standing expiry_date="2011-05-28" type="SUN" />
      <trade_period start_hr="8" start_int="1" end_hr="7" end_int="2" wp_load_mwh="10.0"
supply_quantity_mwh="150.0">
        <trade_detail demand_quantity_mwh="-50.0" participant_name="TESTCONS1" />
        <trade_detail demand_quantity_mwh="-100.0" participant_name="TESTCONS2" />
      </trade_period>
    </bilateral>
  </market_submit>
</bids_offers>
```

### 3.1.3 Sample (Standing cancellation)

*This sample submission is for illustration purposes only.*

```
<?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
<bids_offers xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="mint.xsd">
  <market_cancel trading_date="2011-05-07" application_type="BILATERAL"
participant_name="TESTGEN2" user_name="TESTUSER">
    <bilateral version_no="1.0" standing_flag="true">
      <standing type="SUN">
        </standing>
      </bilateral>
    </market_cancel>
  </bids_offers>
```

### 3.1.4 Sample (Variation)

*This sample submission is for illustration purposes only.*

```
<?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
<bids_offers xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="mint.xsd">
  <market_submit trading_date="2011-05-07" application_type="BILATERAL"
participant_name="TESTGEN2" user_name="TESTUSER">
    <bilateral version_no="1.0" standing_flag="false">
      <trade_period start_hr="8" start_int="1" end_hr="7" end_int="2" wp_load_mwh="10.0"
supply_quantity_mwh="150.0">
        <trade_detail demand_quantity_mwh="-50.0" participant_name="TESTCONS1" />
        <trade_detail demand_quantity_mwh="-100.0" participant_name="TESTCONS2" />
      </trade_period>
    </bilateral>
  </market_submit>
</bids_offers>
```

### 3.1.5 Sample (Variation cancellation)

*This sample submission is for illustration purposes only.*

```
<?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
<bids_offers xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="mint.xsd">
  <market_cancel trading_date="2011-05-07" application_type="BILATERAL"
participant_name="TESTGEN2" user_name="TESTUSER">
    <bilateral version_no="1.0" standing_flag="false">
      </bilateral>
    </market_cancel>
  </bids_offers>
```

### 3.1.6 Sample (Query)

*This sample submission is for illustration purposes only.*

```
<?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
<bids_offers xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="mint.xsd">
  <market_query trading_date="2011-05-07" application_type="BILATERAL"
participant_name="TESTGEN2" user_name="TESTUSER">
    <bilateral start_hr="8" start_int="1" end_hr="10" end_int="2" standing_flag="false"
version_no="1.0" />
  </market_query>
</bids_offers>
```

## 3.2 CSV Format

The bilateral CSV submission consists of a single file. Field details for the CSV file are shown below for each element that comprises a bilateral submission. Note that only submit and cancel actions are permitted and no query action is permitted for the CSV transaction. For bilateral CSV submissions, values for supply\_quantity\_mwh are derived from the negative demand\_quantity\_mwh value, hence the field is not required in CSV submissions.

### 3.2.1 Field Details

#### Bilateral.csv

FIELD NAME	TYPE	CONSTRAINTS	COMMENTS
trading_date	Date (DD/MM/YYYY)	Required	The trading date of the bilateral submission. For standing submissions, the trading date that the standing submission is effective from.
action	String	Required	Either "SUBMIT" for submission, or "CANCEL" for cancel.
standing_flag	Boolean	Required	Whether the submission is a standing (true) or variation (false) submission.
standing_day_type	String	Required if standing_flag = true	Valid values: 'MON', 'TUE', 'WED', 'THU', 'FRI', 'SAT', 'SUN' or 'ALL'. Clause of the WEM Rules 6.7.1 (b) ii.
standing_expiry_date	Date (DD/MM/YYYY)	Required if standing_flag = true and action = "SUBMIT"	The date until which the standing submission is valid. Clause of the WEM Rules 6.7.1 (b) ii.
start_hr	Integer	Required	Starting hour, between 0 and 23.
start_int	Integer	Required	Starting interval within the start hour. Valid values: 1 and 2.
end_hr	Integer	Required	Ending hour, between 0 and 23.
end_int	Integer	Required	Ending interval within the end hour. Valid values: 1 and 2.
wp_load_mwh	Number	Required	Participants must specify a value of 0.
participant_name	String	Required	The name of the other participant in the bilateral contract. Clause of the WEM Rules 6.7.1 (c) ii.
demand_quantity_mwh	Number	Required	The quantity demanded by the other participant. Clause of the WEM Rules 6.7.1 (c) iii.

### 3.2.2 Structure

The following table lists the fields that are relevant for each section contained in the CSV file

Field Group	Fields
Submission	trading_date, action, standing_flag, standing_day_type, standing_expiry_date
Trade Period	start_hr, start_int, end_hr, end_int, wp_load_mwh
Trade Detail	participant_name, demand_quantity_mwh

### 3.2.3 Constraints

All lines in the file must be specified and contain the same values for the submission fields as specified in the 'Field Group' in 3.2.2 above (i.e. trading\_date, action, standing\_flag, standing\_day\_type and

standing\_expiry\_date fields). A submission must be either a standing or a variation submission, not a combination.

All trade details for the same trade period must have the same 'Trade Period' fields, as specified in the 'submission' field group in 3.2.2 above (i.e. start\_hr, start\_int, end\_hr, end\_int and wp\_load\_mwh fields).

When cancelling a Bilateral Standing Submission (action="CANCEL"), the cancellation must be for the same standing\_day\_type as originally submitted. If standing\_day\_type = "MON" the cancellation must reference this value.

### 3.2.4 Sample (Standing)

*This sample submission is for illustration purposes only.*

```
trading_date,action,standing_flag,standing_day_type,standing_expiry_date,start_hr,start_int,end_hr
,end_int,wp_load_mwh,participant_name,demand_quantity_mwh
07/05/2011,submit,true,SUN,28/05/2011,8,1,7,2,10,TESTCONS1,-50
07/05/2011,submit,true,SUN,28/05/2011,8,1,7,2,10,TESTCONS2,-100
```

### 3.2.5 Sample (Standing cancellation)

*This sample submission is for illustration purposes only.*

```
trading_date,action,standing_flag,standing_day_type,standing_expiry_date,start_hr,start_int,end_hr
,end_int,wp_load_mwh,participant_name,demand_quantity_mwh
07/05/2011,cancel,true,ALL, 7/05/2011,8,1,7,2,0,TESTCONS1,0
07/05/2011,cancel,true,MON, 7/05/2011,8,1,7,2,0,TESTCONS1,0
07/05/2011,cancel,true,TUE, 7/05/2011,8,1,7,2,0,TESTCONS1,0
```

### 3.2.6 Sample (Variation)

*This sample submission is for illustration purposes only.*

```
trading_date,action,standing_flag,standing_day_type,standing_expiry_date,start_hr,start_int,end_hr
,end_int,wp_load_mwh,participant_name,demand_quantity_mwh
07/05/2011,submit,false,,,8,1,7,2,10,TESTCONS1,-50
07/05/2011,submit,false,,,8,1,7,2,10,TESTCONS2,-100
```

### 3.2.7 Sample (Variation cancellation)

*This sample submission is for illustration purposes only.*

```
trading_date,action,standing_flag,standing_day_type,standing_expiry_date,start_hr,start_int,end_hr
,end_int,wp_load_mwh,participant_name,demand_quantity_mwh
07/05/2011,cancel,false,,,,,,,,,
```

# 4. STEM

The STEM submission allows participants to submit details on their intent in the Short Term Energy Market. STEM contains details on facilities, supply portfolio curve and demand portfolio curve. Participants are able to query and cancel submissions for an individual trading interval, or a range of trading intervals.

There is no change to the submission format/versioning for STEM. Participants may provide any values in the Ancillary Service and Availability fields as long as they are still conforming with the XSD, the values will not be used.

## 4.1 XML Format

### 4.1.1 Structure

The XML format is specified by mint.xsd.

The following table contains the details of the nesting structure of elements that comprise a STEM submission, and the number of times that each element can occur within the context of its parent element.

ELEMENT	MINT.XSD TYPE	MIN	MAX
Stem	StemSubmit	1	1
Standing	StandingSubmit	0	1
stem_detail	StemDetail	1	48
ancillary_service	AncillaryService	0	1
supply_portfolio_curve	PqCurveWa	1	1
Point	PqPoint	1	Unlimited
demand_portfolio_curve	PqCurveWa	1	1
Point	PqPoint	1	Unlimited
stem_facility_detail	StemFacilityDetail	0	Unlimited
Declaration	DeclarationStem	1	48

Attribute details are shown for each element that comprises a STEM submission. The attributes of the standing element are not covered here as this is detailed in Section 2.1.2.

#### STEM Element

ATTRIBUTE	TYPE	CONSTRAINTS	COMMENTS
version_no	String	Required. Must be set to '1.0'.	
standing_flag	Boolean	Attribute not required if a variation submission	If true, there must be a standing element contained within the stem element. – See Section 2.1.2.

### STEM Detail Element

ATTRIBUTE	TYPE	CONSTRAINTS	COMMENTS
start_hr	Integer	Required	Starting hour, between 0 and 23.
start_int	Integer	Required	Starting interval within the start hour. Valid values: 1 and 2.
end_hr	Integer	Required	Ending hour, between 0 and 23.
end_int	Integer	Required	Ending interval within the end hour. Valid values: 1 and 2.

### Ancillary Service Element

ATTRIBUTE	TYPE	CONSTRAINTS	COMMENTS
total_liquid_mwh	Number	Required	Values no longer used in the new market.
total_non_liquid_mwh	Number	Required	Values no longer used in the new market.

### Supply Portfolio Curve Element

There are no attributes for this element; it contains a collection of point elements, as described below.

### Demand Portfolio Curve Element

There are no attributes for this element; it contains a collection of point elements, as described below.

### Point Element

ATTRIBUTE	TYPE	CONSTRAINTS	COMMENTS
price	Number	Required	Energy price at the point in the supply or demand curve in \$/MWh.  Clause of the WEM Rules 6.6.1 (b) ii & iii and 6.6.1 (c) ii & iii.
quantity	Number	Required	Quantity of energy at the point in the supply or demand curve in Megawatt hours (MWh).  Clause of the WEM Rules 6.6.1 (b) ii & iii and 6.6.1 (c) ii & iii.

### Stem Facility Detail Element

ATTRIBUTE	TYPE	CONSTRAINTS	COMMENTS
facility_name	String (2 to 32 characters)	Required	Name of the facility.  Clause of the WEM Rules 6.6.1 (a).
facility_type	String	Required	Facility Type is no longer validated, however still required as the STEM schema was not updated for the new Market. AEMO will translate all values entered in this field to 'NA'. AEMO recommends Participants enter NA in this field.

### Declaration Element

ATTRIBUTE	TYPE	CONSTRAINTS	COMMENTS
start_hr	Integer	Required	Starting hour, between 0 and 23.

ATTRIBUTE	TYPE	CONSTRAINTS	COMMENTS
start_int	Integer	Required	Starting interval within the start hour. Valid values: 1 and 2.
end_hr	Integer	Required	Ending hour, between 0 and 23.
end_int	Integer	Required	Ending interval within the end hour. Valid values: 1 and 2.
fuel_in_use	String	Required	Valid values: 'LIQUID', 'NON-LIQUID'. Clause of the WEM Rules 6.6.1 (b) i and 6.6.1 (c) i.
unavailable_capacity_mwh	Number	Optional	Values no longer used in the new market.

### 4.1.2 Sample (Standing)

*This sample submission is for illustration purposes only.*

```
<?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
<bids_offers xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="mint.xsd">
  <market_submit application_type="STEM" trading_date="2011-03-09" participant_name="TESTGEN1"
user_name="TESTERG1">
    <stem standing_flag="true" version_no="1.0">
      <standing expiry_date="2011-11-22" type="ALL" />
      <stem_detail start_hr="8" start_int="1" end_hr="7" end_int="2">
        <ancillary_service total_liquid_mwh="0.0" total_non_liquid_mwh="20.0" />
        <supply_portfolio_curve>
          <point price="0.0" quantity="25.392" />
        </supply_portfolio_curve>
        <demand_portfolio_curve>
          <point price="435.0" quantity="25.392" />
        </demand_portfolio_curve>
      </stem_detail>
      <stem_facility_detail facility_name="TESTFAC1" facility_type="NA">
        <declaration start_hr="8" start_int="1" end_hr="7" end_int="2" fuel_in_use="NON-
LIQUID" unavailable_capacity_mwh="0.0" />
      </stem_facility_detail>
    </stem>
  </market_submit>
</bids_offers>
```

### 4.1.3 Sample (Standing cancellation)

*This sample submission is for illustration purposes only.*

```
<?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
<bids_offers>
  <market_cancel application_type="STEM" trading_date="2011-03-09" participant_name="TESTGEN1"
user_name="TESTUSER">
    <stem standing_flag="true" version_no="1.0">
      <standing type="ALL" />
    </stem>
  </market_cancel>
</bids_offers>
```

### 4.1.4 Sample (Variation)

*This sample submission is for illustration purposes only.*

```
<?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
<bids_offers>
  <market_submit application_type="STEM" trading_date="2011-03-09" participant_name="TESTGEN"
user_name="TESTUSER">
    <stem standing_flag="false" version_no="1.0">
      <stem_detail start_hr="8" start_int="1" end_hr="7" end_int="2">
        <ancillary_service total_liquid_mwh="0.0" total_non_liquid_mwh="20.0" />
        <supply_portfolio_curve>
          <point price="0.0" quantity="25.392" />
        </supply_portfolio_curve>
      </stem_detail>
    </stem>
  </market_submit>
</bids_offers>
```

```

        <demand_portfolio_curve>
          <point price="435.0" quantity="25.392" />
        </demand_portfolio_curve>
      </stem_detail>
      <stem_facility_detail facility_name="TESTFAC1" facility_type="NA">
        <declaration start_hr="8" start_int="1" end_hr="7" end_int="2" fuel_in_use="NON-
LIQUID" unavailable_capacity_mwh="0.0" />
      </stem_facility_detail>
    </stem>
  </market_submit>
</bids_offers>

```

#### 4.1.5 Sample (Variation cancellation)

*This sample submission is for illustration purposes only.*

```

<?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
<bids_offers>
  <market_cancel application_type="STEM" trading_date="2011-03-09" participant_name="TESTGEN1"
user_name="TESTERG1">
    <stem standing_flag="false" version_no="1.0">
      </stem>
    </market_cancel>
  </bids_offers>

```

#### 4.1.6 Sample (Query)

*This sample submission is for illustration purposes only.*

```

<?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
<bids_offers>
  <market_query application_type="STEM" trading_date="2011-03-09" participant_name="TESTGEN1"
user_name="TESTERG1">
    <stem standing_flag="true" version_no="1.0">
      <standing type="ALL" />
    </stem>
  </market_query>
</bids_offers>

```

### 4.2 CSV Format

The STEM CSV format consists of four files that contain details on the STEM submission, including ancillary services, supply portfolio curve, demand portfolio curve and facility declarations. Not all CSV files are required to make up a complete STEM submission. The following table indicates which files are required. Note that only submit and cancel actions are permitted and no query is permitted for the CSV transaction.

File	Required
stem_facility_detail.csv	Not required
stem_ancillary_service.csv	Can still be submitted, however, no longer used or required in the new market
stem_supply_portfolio_curve.csv	Required
stem_demand_portfolio_curve.csv	Required (unless a cancel submission)

#### 4.2.1 Field Details

##### stem\_facility\_detail.csv

FIELD NAME	TYPE	CONSTRAINTS	COMMENTS
facility_name	String (2 to 32 characters)	Required	The name of the facility whose details are supplied. Clause of the WEM Rules 6.6.1 (a).

FIELD NAME	TYPE	CONSTRAINTS	COMMENTS
facility_type	String	Required	Facility Type is no longer validated, however still required as the STEM schema was not updated for the new Market. AEMO will translate all values entered in this field to 'NA'. AEMO recommends Participants enter NA in this field.
start_hr	Integer	Required	Starting hour, between 0 and 23.
start_int	Integer	Required	Starting interval within the start hour. Valid values: 1 and 2.
end_hr	Integer	Required	Ending hour, between 0 and 23.
end_int	Integer	Required	Ending interval within the end hour. Valid values: 1 and 2.
fuel_in_use	String	Required	Valid values: 'LIQUID', 'NON-LIQUID'. Clause of the WEM Rules 6.6.1 (b) i and 6.6.1 (c) i.
unavailable_capacity_mwh	Number	Optional	Values no longer used in the new market.

### stem\_ancillary\_service.csv

FIELD NAME	TYPE	CONSTRAINTS	COMMENTS
start_hr	Integer	Required	Starting hour, between 0 and 23.
start_int	Integer	Required	Starting interval within the start hour. Valid values: 1 and 2.
end_hr	Integer	Required	Ending hour, between 0 and 23.
end_int	Integer	Required	Ending interval within the end hour. Valid values: 1 and 2.
total_liquid_mwh	Number	Required	Values no longer used in the new market.
total_non_liquid_mwh	Number	Required	Values no longer used in the new market.

### stem\_supply\_portfolio\_curve.csv

The supply portfolio curve file contains the trading date of the submission, and standing submissions standing details as there will always be at least one supply portfolio curve record.

FIELD NAME	TYPE	CONSTRAINTS	COMMENTS
trading_date	Date (DD/MM/YYYY)	Required	The trading date of the STEM submission. For standing submissions, the trading date that the standing submission is effective from.
action	String	Required	Either "SUBMIT" for submission, or "CANCEL" for cancel.
standing_flag	Boolean	Required	Whether the submission is a standing submission (true) or a variation submission (false).
standing_day_type	String	Required if standing_flag = true	Valid values: 'MON', 'TUE', 'WED', 'THU', 'FRI', 'SAT', 'SUN' or 'ALL'. Clause of the WEM Rules 6.3C.6A.

FIELD NAME	TYPE	CONSTRAINTS	COMMENTS
standing_expiry_date	Date (DD/MM/YYYY)	Required if standing_flag = true	The final date on which the standing submission is valid. Clause of the WEM Rules 6.3C.6A.
start_hr	Integer	Required	Starting hour, between 0 and 23.
start_int	Integer	Required	Starting interval within the start hour. Valid values: 1 and 2.
end_hr	Integer	Required	Ending hour, between 0 and 23.
end_int	Integer	Required	Ending interval within the end hour. Valid values: 1 and 2.
price	Number	Required if action = "SUBMIT"	Energy price at the point in the supply curve in \$/MWh. Clause of the WEM Rules 6.6.1 (b) ii & iii.
quantity	Number	Required if action = "SUBMIT"	Quantity of energy at the point in the supply curve in Megawatt hours (MWh). Clause of the WEM Rules 6.6.1 (b) i & iii.

### stem\_demand\_portfolio\_curve.csv

FIELD NAME	TYPE	CONSTRAINTS	COMMENTS
start_hr	Integer	Required	Starting hour, between 0 and 23.
start_int	Integer	Required	Starting interval within the start hour. Valid values: 1 and 2.
end_hr	Integer	Required	Ending hour, between 0 and 23.
end_int	Integer	Required	Ending interval within the end hour. Valid values: 1 and 2.
price	Number	Required	Energy price at the point in the demand curve in \$/MWh. Clause of the WEM Rules 6.6.1 (c) ii & iii.
quantity	Number	Required	Quantity of energy at the point in the demand curve in Megawatt hours (MWh). Clause of the WEM Rules 6.6.1 (c) ii & iii.

## 4.2.2 Structure

The following table shows the sections within the STEM submission, the files in which the sections are contained and the fields in each section.

Section	Files	Fields
STEM submission	stem_supply_portfolio_curve.csv	trading_date, action, standing_flag, standing_day_type, standing_expiry_date
STEM detail	stem_ancillary_service.csv stem_supply_portfolio_curve.csv stem_demand_portfolio_curve.csv	start_hr, start_int, end_hr, end_int
Ancillary Services	stem_ancillary_service.csv	total_liquid_mwh, total_non_liquid_mwh
Supply Portfolio Curve	stem_supply_portfolio_curve.csv	price, quantity

Section	Files	Fields
Demand Portfolio Curve	stem_demand_portfolio_curve.csv	price, quantity
Facility Detail	stem_facility_detail.csv	facility_name, facility_type
Facility Declaration	stem_facility_detail.csv	start_hr, start_int, end_hr, end_int, fuel_in_use, unavailable_capacity_mwh

### 4.2.3 Constraints

All lines in the stem\_supply\_portfolio\_curve.csv file must contain the same values for the 'STEM submission' section, as specified above (i.e. trading\_date, action, standing\_flag, standing\_day\_type and standing\_expiry\_date fields). A submission must be either a standing or variation, not a combination.

The trading\_date, action, standing\_flag, standing\_day\_type and standing\_expiry\_date must have the same values for all rows in the stem\_supply\_portfolio\_curve.csv file.

The stem\_ancillary\_service.csv, stem\_supply\_portfolio\_curve.csv and stem\_demand\_portfolio\_curve.csv files contain the start and end trading intervals for which the details apply. If these intervals are duplicated in the separate files, a common stem detail will be created that becomes the parent of the ancillary service, supply portfolio or demand portfolio.

The start and end hour and interval ranges must have the same values across all CSV submission files.

### 4.2.4 Sample (Standing)

*These sample submissions are for illustration purposes only.*

Sample stem\_facility\_detail.csv

```
facility_name,facility_type,start_hr,start_int,end_hr,end_int,fuel_in_use,unavailable_capacity_mwh
STHRNCRS_EG,NA,8,1,8,1,NON-LIQUID,0
STHRNCRS_EG,NA,8,2,8,2,NON-LIQUID,0
```

Sample stem\_ancillary\_service.csv

```
start_hr,start_int,end_hr,end_int,total_liquid_mwh,total_non_liquid_mwh
8,1,7,2,0,25
```

Sample stem\_supply\_portfolio\_curve.csv

```
trading_date,action,standing_flag,standing_day_type,standing_expiry_date,start_hr,start_int,end_hr,end_int,price,quantity
9/03/2011,submit,true,ALL,22/11/2011,8,1,7,2,0,4.392
```

Sample stem\_demand\_portfolio\_curve.csv

```
start_hr,start_int,end_hr,end_int,price,quantity
8,1,7,2,435,4.392
```

### 4.2.5 Sample (Standing cancellation)

Note: Only a 'stem\_supply\_portfolio\_curve.csv' file is required as part of a STEM cancel submission.

*This sample submission is for illustration purposes only.*

Sample stem\_supply\_portfolio\_curve.csv

```
trading_date,action,standing_flag,standing_day_type,standing_expiry_date,start_hr,start_int,end_hr,end_int,price,quantity
9/03/2011,cancel,true,ALL,30/06/2011,8,1,7,2,,
```

### 4.2.6 Sample (Variation)

*These sample submissions are for illustration purposes only.*

Sample stem\_facility\_detail.csv

```
facility_name,facility_type,start_hr,start_int,end_hr,end_int,fuel_in_use,unavailable_capacity_mwh
STHRNCRS_EG,NA,8,1,8,1,NON-LIQUID,0
```

```
STHRNCRS_EG,SCHED_GEN,8,2,8,2,NON-LIQUID,0
```

#### Sample stem\_ancillary\_service.csv

```
start_hr,start_int,end_hr,end_int,total_liquid_mwh,total_non_liquid_mwh  
8,1,7,2,0,25
```

#### Sample stem\_supply\_portfolio\_curve.csv

```
trading_date,action,standing_flag,standing_day_type,standing_expiry_date,start_hr,start_int,end_hr  
,end_int,price,quantity  
9/03/2011,submit,false,,8,1,7,2,0,4.392
```

#### Sample stem\_demand\_portfolio\_curve.csv

```
start_hr,start_int,end_hr,end_int,price,quantity  
8,1,7,2,435,4.392
```

## 4.2.7 Sample (Variation cancellation)

Note: Only a 'stem\_supply\_portfolio\_curve.csv' file is required as part of a STEM cancel submission.

*This sample submission is for illustration purposes only.*

#### Sample stem\_supply\_portfolio\_curve.csv

```
trading_date,action,standing_flag,standing_day_type,standing_expiry_date,start_hr,start_int,end_hr  
,end_int,price,quantity  
17/03/2021,cancel,false,,8,1,7,2,,
```

# 5. Web Services Submissions

Web service submissions provide the same options and support the same exchange format as the MPI (File Exchange), so given an XML document for a submission, it can either be submitted manually via the MPI or programmatically via the appropriate web service:

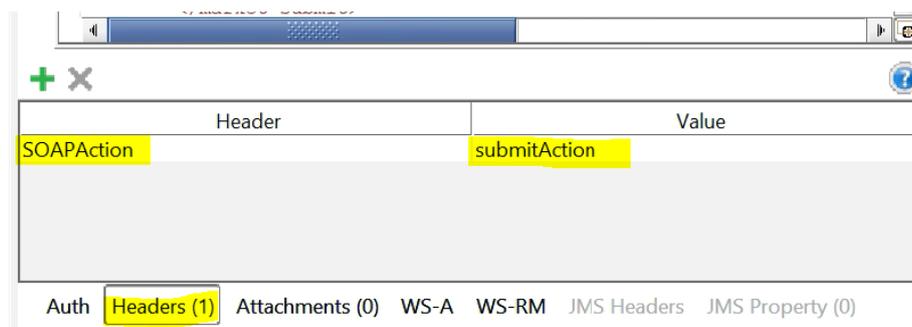
<BaseURL>trading/v1

Environment	Base URL	Certificate Type
RFM	https://wems-rfm.aemo.com.au/mpi/ws/	Local Certificate
RFM [APIM]	https://apis.rfm.aemo.com.au:9319/WEM/	DigiCert
MKT (PreProd)	https://wems-mkt.aemo.com.au/mpi/ws/	Local Certificate
MKT (PreProd) [APIM]	https://apis.preprod.aemo.com.au:9319/WEM/	DigiCert
Production	https://wems.aemo.com.au/mpi/ws/	Local Certificate
Production [APIM]	https://apis.prod.aemo.com.au:9319/WEM/	DigiCert

## 5.1.1 Structure

The XML format is specified by mint.xsd. In addition to the submission format details previously covered in this document for Standing and Variation STEM/ Bilateral submissions, the /trading endpoint requires:

- <![CDATA[ to be included prior to <bids\_offers>
- When using SOAP UI + DigiCert
  - A SOAPAction header with value *submitAction*
- When using Postman + DigiCert
  - A *x-initiatingParticipantId* header: The ID of the Participant making the submission
  - A *x-market* header: WEM



## 5.1.2 Sample

### SOAP STEM Variation XML

```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:typ="http://mint.org/MintWebService/types">
  <soapenv:Header/>
  <soapenv:Body>
    <typ:BidDataInput>
      <![CDATA[<bids_offers xmlns:xsi = "http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation = "mint.xsd">
        <market_submit valid="true" mode="NORMAL" user_name="AEMOTESTER" participant_name="AEMO"
trading_date="2023-08-03" delivery_date="2023-08-30" application_type="STEM">
          <stem version_no="1.0" standing_flag="false">
            <stem_detail end_int="2" end_hr="11" start_int="1" start_hr="8">
              <ancillary_service total_non_liquid_mwh="10.0"
total_liquid_mwh="0"></ancillary_service>
              <supply_portfolio_curve>
                <point quantity="17.6" price="25.25"></point>
              </supply_portfolio_curve>
              <demand_portfolio_curve>
                <point quantity="10.8" price="200"></point>
              </demand_portfolio_curve>
            </stem_detail>
            <stem_facility_detail facility_type="NA" facility_name="FACILITY_NAME">
              <declaration end_int="2" end_hr="11" start_int="1" start_hr="8"
unavailable_capacity_mwh="10" fuel_in_use="NON-LIQUID"></declaration>
            </stem_facility_detail>
          </stem>
        </market_submit>
      </bids_offers>]]>
    </typ:BidDataInput>
  </soapenv:Body>
</soapenv:Envelope>
```

### SOAP Bilateral Standing XML

```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:typ="http://mint.org/MintWebService/types">
  <soapenv:Header/>
  <soapenv:Body>
    <typ:BidDataInput>
      <![CDATA[<bids_offers xmlns:xsi = "http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation = "mint.xsd">
        <market_submit trading_date="2023-08-06" application_type="BILATERAL"
participant_name="AEMO" user_name="AEMOTESTER">
          <bilateral version_no="1.0" standing_flag="true">
            <standing expiry_date="2023-08-30" type="MON" />
            <trade_period start_hr="8" start_int="1" end_hr="12" end_int="2"
wp_load_mwh="30.1" supply_quantity_mwh="84.99">
              <trade_detail demand_quantity_mwh="-11.26" participant_name="PARTICIPANT1" />
              <trade_detail demand_quantity_mwh="-62.11" participant_name="PARTICIPANT2" />
              <trade_detail demand_quantity_mwh="-11.62" participant_name="PARTICIPANT3" />
            </trade_period>
          </bilateral>
        </market_submit>
      </bids_offers>]]>
    </typ:BidDataInput>
  </soapenv:Body>
</soapenv:Envelope>
```

```
        </trade_period>
      </bilateral>
    </market_submit>
  </bids_offers>]]>
</typ:BidDataInput>
</soapenv:Body>
</soapenv:Envelope>
```