GUIDE TO AEMO CSV DATA FORMAT STANDARD

THURSDAY, 20 MARCH 2014

AEMO
AUSTRALIAN ENERGY MARKET OPERATOR

Version: 3.01

Important Notice

AEMO has prepared this Guide to AEMO CSV Data Format Standard (Guide) to provide guidance on the use of the AEMO's energy market systems under the National Gas or Electricity Rules (Rules), as at the date of publication.

No reliance or warranty

This Guide does not constitute legal or business advice, and should not be relied on as a substitute for obtaining detailed advice about the National Gas or Electricity Law, the Rules or any other applicable laws, procedures or policies. While AEMO has made every effort to ensure the quality of the information in this Guide, neither AEMO, nor any of its employees, agents and consultants make any representation or warranty as to the accuracy, reliability, completeness, currency or suitability for particular purposes of that information.

Limitation of liability

To the maximum extent permitted by law, AEMO and its advisers, consultants and other contributors to this Guide (or their respective associated companies, businesses, partners, directors, officers or employees) are not liable (whether by reason of negligence or otherwise) for any errors, omissions, defects or misrepresentations in this document, or for any loss or damage suffered by persons who use or rely on the information in it.

Copyright

Trademark notices

Microsoft is a trademark of Microsoft Corporation in the United States and/or other countries.
Oracle and Java are registered trademarks of Sun Microsystems, Inc. in the U.S. and other countries.

Documents made obsolete

The release of this document changes the Flat File Specification v1.06 and earlier versions of Guide to AEMO CSV Data Format Standard.

Distribution

Available to the public.

Prepared by

PMO Documentation Team
Last update: 20/03/2014 12:59 PM

Notes

Updated for May Release 2014 and add new Gas Supply Hub (GSH).

Further information

For further information, please visit www.aemo.com.au or contact:
AEMO Information and Support Hub
Phone: 1300 AEMO 00 (1300 236 600) and follow the prompts.
Email: supporthub@aemo.com.au

Contents

Figures

Tables

Glossary

These abbreviations, symbols, and special terms assist the reader's understanding of the terms used in this document. For definitions of these terms, the reader should always refer to the applicable market Rules.

A

AEMC
Australian Energy Market Commission

AEMO
Australian Energy Market Operator

AES
Advanced Encryption Standard

AEST
Australian Eastern Standard Time

B

B2B
Business to business (communication)

Batch entity
File-based

Bid
Offer (as in NER)

C

CSV
Comma-separated values; a file format for exchanging data.

E

EMMS
[wholesale] Electricity Market Management System; software, hardware, network and related processes to implement the National Electricity Market (NEM).

P

Participant ID
Registered participant identifier

POP
Point of presence (in network)

Pre-production
Test and training environment, typically showing much less activity, if any.

Production
Live environment, actively reflecting the currently available data.

R

Rules
The National Electricity or Gas Rules.

Z

ZIP

The file compression format used for exchanging data with AEMO.

1 Introduction

1.1 Purpose

This document describes the CSV data format standard used within flat files provided to participants from AEMO's systems. Its primary function is to provide sufficient information to allow participants to understand the CSV data format used for exchanging data with AEMO.

Where there is a discrepancy between the information in this document and the Rules, the Rules take precedence.

1.2 Audience

This guide is relevant to:

- Implementers and maintainers of interfaces to AEMO's systems.
- Parties with responsibility for using interfaces to AEMO's systems.

1.3 How to use this guide

Text in this format, indicates a direct hyperlink with further details of the resource listed, .

1.4 What's in this guide?

The description of the CSV (comma-separated-variables) format used in numerous interfaces in AEMO's energy market systems, including some payloads in aseXML.

2 CSV Format

In this section:

The AEMO CSV data format standard uses a spreadsheet or text editor layout. The file format allows for:

- Different report records presented in the same file.
- A report record definition to change over time (hence the report version numbers). The nature of changes is designed to cause minimum disruption to existing processes and also allow for transition periods to new report record formats.
- Data presented on a report record to come from a number of different tables. This enables the production of reports, for example, 5-minute data, 30-minute data, and daily data.
- Each data record is self-contained, for example, correct interpretation requires no other data records.

2.1 CSV spreadsheet layout

This layout opens in a spreadsheet application such as MS Excel. In the spreadsheet format, fields are separated by columns, so it is important to match the column headings (I records) and data records (D records)—including any blank columns (see "Comment records" on page 3). The spreadsheet format has the `.CSV` extension (not .XLS or .XLSX).

Excel always removes leading zeros and spaces from fields before displaying them.

2.2 CSV text editor layout

This layout opens in a text editor application such as MS Notepad. In the text editor layout, fields are separated with commas, so it is very important to match the column headings (I records) and commas to the data records (D records). Spaces are considered part of a field and must not be ignored. The last field in the record is not followed by a comma. Text editor files have the **.CSV** extension (not .TXT).

If you are preparing a file for upload to AEMO's systems, the columns and spaces in each layout are vital placeholders and cannot be ignored. Without them, the system cannot read your file.

2.3 CSV file format

This section describes the CSV data format standard used within flat files provided to participants from AEMO's systems. Its primary function is to provide sufficient information to allow participants to understand the CSV data format used for exchanging data with AEMO.

Each record in a file starts with one of the following three characters:

- C = comment
- I = information
- D = data

2.3.1 Comment records

These records start with "C," mostly they are free format text, except for the first and last records in the file. They list, for example, report selection parameters and interpretation notes, see 2.3.2 "First C record in a file".

2.3.2 First C record in a file

The first C record in a file is of the format:

```
C,<system>,<report id>,<from>,<to>,<publish date>,<publish time>
```

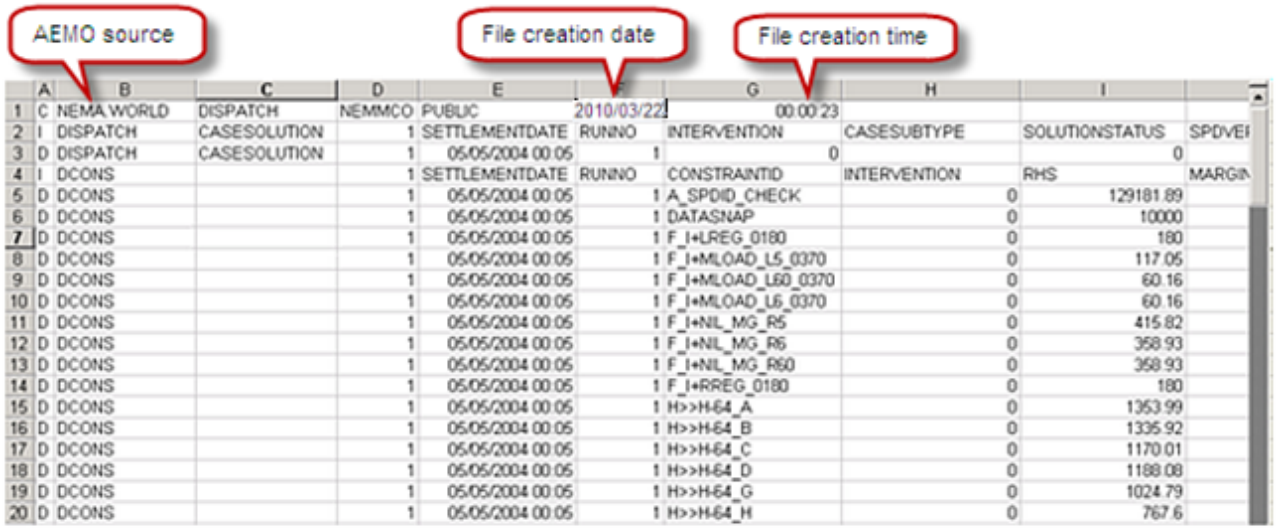
Table 1: CSV metadata fields

Field	Example	Data format
system	USER TEST, PRODUCTION, ACCEPTANCE TEST, DEVELOPMENT	UPPERCASE

Field	Example	Data format
report id	DISPATCH	UPPERCASE
from	Typically AEMO or in legacy systems NEMMCO	UPPERCASE
to	PARTICIPANT ID or PUBLIC	UPPERCASE
publish date	2011/04/25	YYYY/MM/DD (EST)
publish time	00:00:23	HH:MM or HH:MM:SS as appropriate (EST)

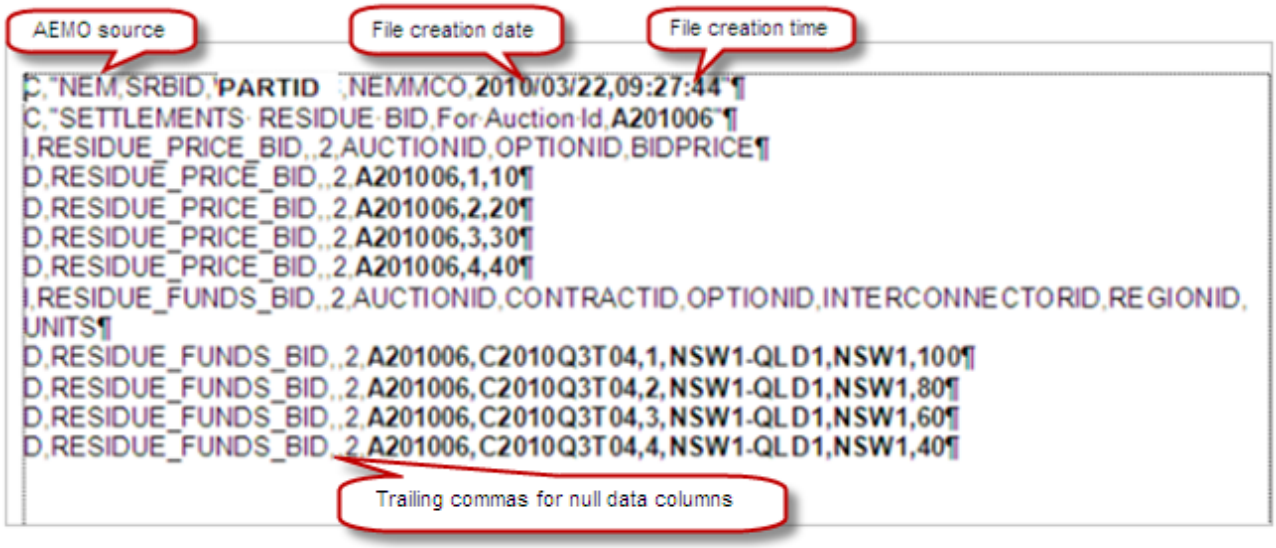
If required, further metadata fields can be included after these fields.

Figure 1: first C record spreadsheet example



	A	B	C	D	E	F	G	H	I	
1	C	NEMMCO WORLD	DISPATCH	NEMMCO	PUBLIC	2010/03/22	00:00:23			
2	I	DISPATCH	CASESOLUTION	1	SETTLEMENTDATE	RUNNO	INTERVENTION	CASESUBTYPE	SOLUTIONSTATUS	SPDVEI
3	D	DISPATCH	CASESOLUTION	1	05/05/2004 00:05	1	0		0	
4	I	DCONS		1	SETTLEMENTDATE	RUNNO	CONSTRAINTID	INTERVENTION	RHS	MARGIN
5	D	DCONS		1	05/05/2004 00:05	1	A_SPDID_CHECK	0	129181.89	
6	D	DCONS		1	05/05/2004 00:05	1	DATASNAP	0	10000	
7	D	DCONS		1	05/05/2004 00:05	1	F_I+LREG_0180	0	180	
8	D	DCONS		1	05/05/2004 00:05	1	F_I+MLOAD_L5_0370	0	117.05	
9	D	DCONS		1	05/05/2004 00:05	1	F_I+MLOAD_L60_0370	0	60.16	
10	D	DCONS		1	05/05/2004 00:05	1	F_I+MLOAD_L6_0370	0	60.16	
11	D	DCONS		1	05/05/2004 00:05	1	F_I+NIL_MG_R5	0	415.82	
12	D	DCONS		1	05/05/2004 00:05	1	F_I+NIL_MG_R6	0	358.93	
13	D	DCONS		1	05/05/2004 00:05	1	F_I+NIL_MG_R60	0	358.93	
14	D	DCONS		1	05/05/2004 00:05	1	F_I+RREG_0180	0	180	
15	D	DCONS		1	05/05/2004 00:05	1	H>>H-64_A	0	1353.99	
16	D	DCONS		1	05/05/2004 00:05	1	H>>H-64_B	0	1335.92	
17	D	DCONS		1	05/05/2004 00:05	1	H>>H-64_C	0	1170.01	
18	D	DCONS		1	05/05/2004 00:05	1	H>>H-64_D	0	1188.08	
19	D	DCONS		1	05/05/2004 00:05	1	H>>H-64_G	0	1024.79	
20	D	DCONS		1	05/05/2004 00:05	1	H>>H-64_H	0	767.6	

Figure 2: first C record text editor example



2.3.3 Last C record in a file

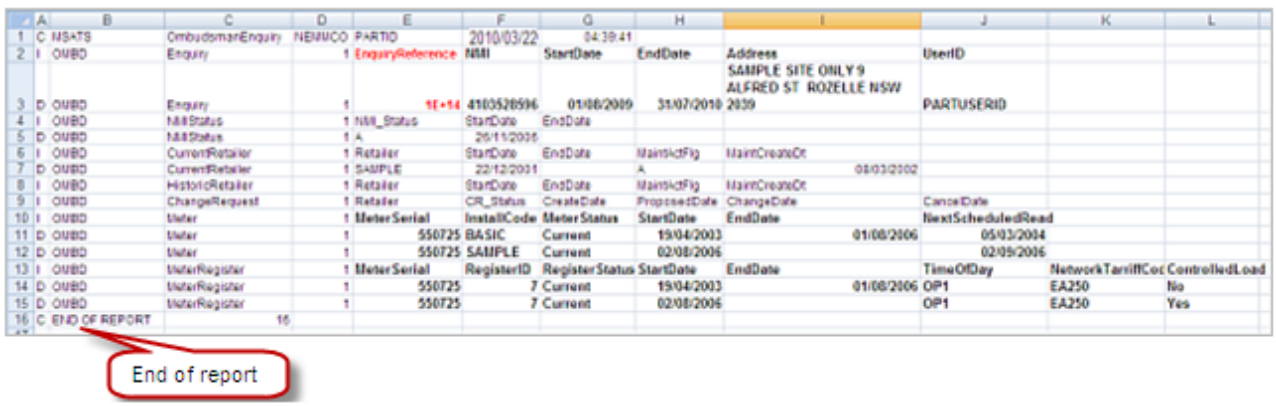
The last C record in a file is of the format:

```
C, END OF REPORT, <count of records>
```

Where the <count of records> is for low level checking that all records are received (it includes the last "C" record in a file).

In some cases, the "END OF REPORT" string is enclosed by a set of double quotation marks ("....").

Figure 3: last C record end of report spreadsheet example



2.3.4 Informational records

Informational records start with “I”. "I" records list column headings for particular report record formats (see "Data records" on page 6). For example:

```
I,<report type>,<report subtype>,<report version>,<column header>,<column header>,
<column header>
```

Table 2: CSV information records

Field	Example	Format
report type	DISPATCH	UPPERCASE
report subtype	CASESOLUTION	UPPERCASE
report version	1	Integer
column header	SETTLEMENTDATE, INTERVENTION, CONSTRAINTID	Uppercase

- Each data and matching Information record identifies the report record format it uses by the combination of report type, report subtype and report version.
- For each combination of the above, the column headings are fixed. If a report type or report subtype definition is altered (usually by adding columns) a new report version is issued.
- It is possible for the <report subtype> to be null represented by a space between the delimiting commas, for example:

```
I, DCONS,,2,RUNDATETIME,RUNNO,
```

```
D, DCONS,,2,”1998/05/29 13:30”,1,
```

2.3.5 Data records

These records start with “D,” and contain the report data, see 2.3.5 "Data records". EMMS data records immediately follow the column heading definitions (informational records). Some older version CSV files included all the “I” records at the top of the file. An example of a D record is:

```
D,<report type>,<report subtype>,<report version>,<data>,<data>,<data>
```

For each line, there is a data record (D record) for each corresponding column heading (I record).

Table 3: CSV data record examples

Field	Example	Format
report type	DISPATCH	UPPERCASE
report subtype	CASESOLUTION	UPPERCASE
report version	1	Integer
data	DCONS 2010/03/22, 00:00:23, 1, 0, 0 etc.	see "CSV basic format rules" on page 8

Figure 4: CSV I and D record spreadsheet example

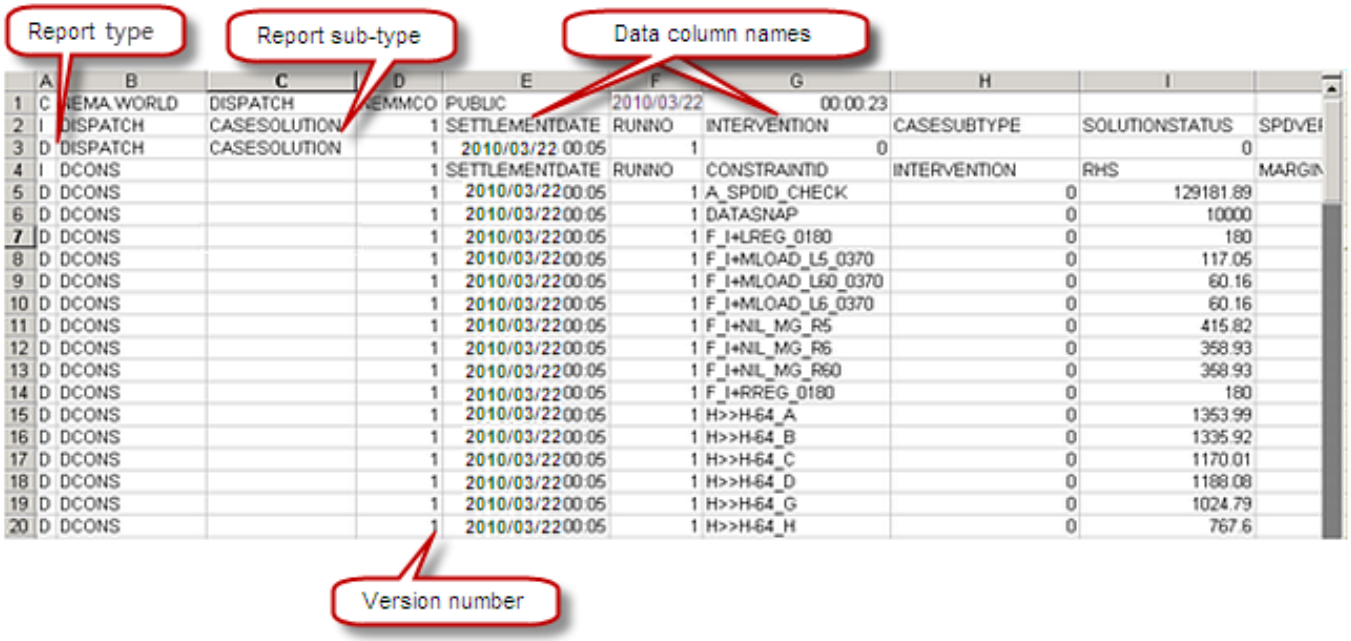
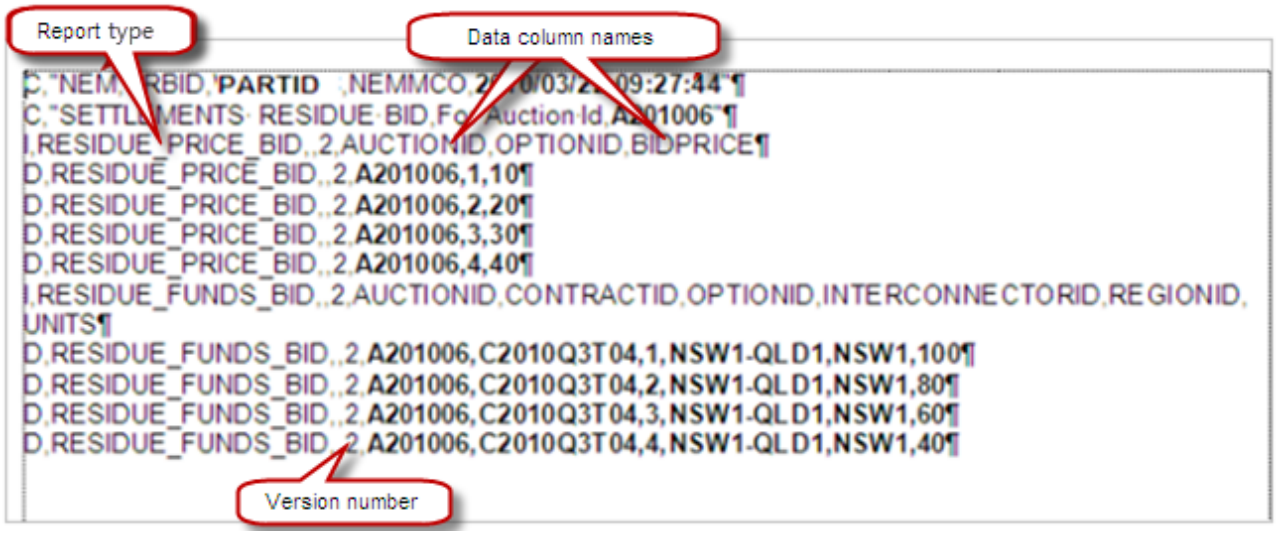


Figure 5: CSV I and D record text editor example



2.4 CSV basic format rules

Described in the following table are some basic CSV formatting rules.

Table 4: basic CSV formatting rules

Description	Explanation
Currency	Currencies do not have a $ sign, e.g.117.05 or 180
Date representation	There is no difference in representation between a date and a date time. Everything is a fully qualified date-time. All times are in (Australian) EST GMT+10. "1997/12/28 00:00:00"
Double quotations inside a field	Double quotations inside a field are escaped by preceding them with another double quote, e.g. aaa,"b""bb",ccc
Empty data columns	Null data columns require trailing commas; see 2.3.1 "Comment records"".
Fraction representation	AEMO systems support integers or real numbers only; the exponent format is not supported.
Line terminator	The ASCII carriage return is used to indicate the end of each line of CSV data. In Windows systems the line terminator is a carriage return (CR+LF). In Unix-like systems the line terminator is \r\n.
Numbers	Written as integers or reals (do not use commas), e.g. 10000.
Records	Each record is one line, delimited by a line terminator, see “Line terminator” below.
Spaces - leading or trailing	Fields with leading or trailing spaces must be delimited with double-quote characters, e.g. John ," Doe ". Avoid unless absolutely necessary.
Special characters	Special characters such as commas are enclosed in double quotation marks, e.g. aaa","b

2.5 CSV filename rules

Described in the following table are some filenaming rules, these rules are generic only, check the user guide for the application you are using for more detailed file formatting information.

Table 5: CSV filename rules

Description	Explanation
Ampersands (&)	Do not use ampersands in filenames
Case sensitive filenames	Filenames are case sensitive, check the relevant user guide for the exact format of the filename for the AEMO application you are using.
Filename delimiters	Filenames are made up of the file masks specific to each application and delimited by underscores, e.g. the EMMS system uses participant ID_ SRBID_AUCTIONID,
Filename prefix	In the EMMS system the filename prefix relates to data confidentiality, e.g. PUBLIC_ for public data and participant ID_ for private data.
Unique filenames	Filenames are unique, i.e. the same filename is not used for different data.
ZIP name and CSV name	In most cases the .ZIP filename corresponds with the .CSV filename.

2.6 Compression format

The AEMO compression format for exchanging files supports:

- 256-bit Advanced Encryption Standard (AES).
- ZIP compression for numerous standard ZIP tools such as, WinZip and WinRAR etc.
- One .CSV file per .ZIP (this is true in the majority of cases but check the relevant AEMO application).
- In most cases the .ZIP filename corresponds with the .CSV filename.
- All files must have the .ZIP extension.

3 Needing Help

3.1 AEMO's Information and Support Hub

3.1.1 Contacting the Information and Support Hub

IT assistance is requested through AEMO's Information and Support Hub using one of the following methods:

- Phone: 1300 AEMO 00 (1300 226 600) and follow the prompts.

  For non-urgent issues, normal coverage is 8:00 AM to 6:00 PM on weekdays, Australian Eastern Standard Time (AEST).

- Email: supporthub@aemo.com.au
- The Customer Portal, http://helpdesk.preprod.nemnet.net.au/nemhelplite/ allows you to log your own requests for assistance. For access credentials, see your organisation's IT security contact or participant administrator.

Please note that AEMO recommends participants call AEMO's Information and Support Hub for all urgent issues, whether or not you have logged a call in the Customer Portal.

3.1.2 Information to provide AEMO

Please provide the following information when requesting IT assistance from AEMO:

- Your name
- Organisation name
- Participant ID
- System or application name
- Environment: production or pre-production
- Problem description
- Screenshots

For AEMO software-related issues please also provide:

- Version of software
- Properties or log files
- Replication Manager support dump and instance name (if Data Interchange problem)

3.2 Feedback

To suggest corrections to this document, please contact the AEMO Information and Support Hub.

4 References

The resources listed in this section contain related information that may assist you. Please ensure you are reading the latest version.

4.1 Rules, law, and government bodies

- "Australian Energy Market Commission" (AEMC), electricity and gas rules http://www.aemc.gov.au/index.html.
- "Australian Energy Regulator (AER)", www.aer.gov.au.

4.2 AEMO's website

- AEMO website: www.aemo.com.au
- “aseXML Standards”, help with aseXML, including guidelines, schemas, change process, sample files and white papers, http://www.aemo.com.au/About-the-Industry/Information-Systems/aseXML-Standards (Home>About the Industry>Information Systems>aseXML Standards).
- *Guide to Information Systems*, information about AEMO's energy market IT systems: http://www.aemo.com.au/About-the-Industry/Information-Systems (Home > About the Industry > Information Systems).
- “Information Systems”, IT systems information, related documents, and access forms: http://www.aemo.com.au/About-the-Industry/Information-Systems (Home > About the Industry > Information Systems).
- "IT Assistance", information to assist participants with IT related issues: http://www.aemo.com.au/About-the-Industry/Information-Systems/IT-Assistance (Home > About the Industry > Information Systems > IT Assistance).
- "Using Energy Market Information Systems", IT systems documentation and software: http://aemo.com.au/About-the-Industry/Information-Systems/Using-Energy-Market-Information-Systems(Home > About the Industry > Information Systems > Using Energy Market Information Systems).

5 Index