CONCISE GUIDE TO DATA INTERCHANGE

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Documents made obsolete

The release of this document changes any version of the Concise Guide to Data Interchange.

Distribution

Available to the public.

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Notes

No notes

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

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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

AEMO
Australian Energy Market Operator

AES
Advanced Encryption Standard

AEST
Australian Eastern Standard Time

B

Batcher
pdrBatcher

C

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

D

DBA
Database administrator

DBMS
Participant's database management system conforming to the MMS Data Model.

DI
Data Interchange

DR
Disaster recovery

E

EMMS
Wholesale Electricity Market Management System; software, hardware, network and related processes.

energy market systems web portal
Single web portal interface to access AEMO's IT systems.

F

FTP
File transfer protocol

L

Loader
pdrLoader

M

MarketNet
AEMO's private network available to participants having a participant ID.

MMD Data Model
The definition of the interface to participants of data published by AEMO. It includes database tables, indexes, and primary keys.

N

NEM
National Electricity Market

NER
National Electricity Rules

NGR
National Gas Rules

P

PA

Participant Administrator; manages participant organisations user access and security.

Participant ID

Registered participant identifier

PDR

Participant Data Replication

pdrBatcher

Participant Data Replication Batcher

pdrLoader

Participant Data Replication Loader

Pre-production

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

Production

Live environment, actively reflecting the currently available data.

R

Replication Manager

Manages the configuration settings and monitors the status of the replication of data from AEMO's systems to the participant's DBMS.

Rules

The National Electricity or Gas Rules.

S

Standard Data Interchange environment

A single data feed, from one Participant ID folders on the participant file server, to a single participant database. For example, you can have your pre-production environment connected to the participant file server pre-production environment and your production environment connected to the participant file server production environment. Under no circumstance point your pre-production environment to the AEMO production environment or vice versa.

Z

ZIP

The file compression format used for exchanging data with AEMO.

1 Introduction

In this chapter:

1.1 Purpose

This is a concise guide assisting participants to understand AEMO's Data Interchange software. It describes how to set up a standard Data Interchange environment to replicate data between AEMO's energy market systems and participants' local DBMS conforming to the MMS Data Model. The standard environment is AEMO's recommended configuration.

This document is written in plain language for ease of reading. Where there is a discrepancy between the Rules, and information or a term in this document, the Rules take precedence.

1.2 Audience

This guide is relevant to registered participants who implement and maintain interfaces to AEMO's energy market systems. IT knowledge, including networking, database management, batch file management, and disaster recovery is required to understand this guide.

1.3 How to use this guide

This is a concise guide only, assisting your understanding of the Data Interchange software components and describing how to set up a standard Data Interchange environment.

Other useful references, including other configuration options, and assistance with Data Interchange issues are available on the Data Interchange web page:

- Data Interchange Guide: A comprehensive guide to Data Interchange that includes options to consider before set up, different configuration options, and data recovery options.

- Guide to Troubleshooting Data Interchange: Assistance with Data Interchange software issues.

- For more details about individual Data Interchange software components, see "Related resources" below.

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

1.4 What's in this guide

- Chapter 2 "About Data Interchange Software" on page 4 provides and overview of the Data Interchange software, what it is for, who can you use, and how to use it.
- Chapter 3 "Components" on page 7 explains the different components that make up Data Interchange.
- Chapter 4 "Implementation" on page 10 explains how to set up a standard implementation of Data Interchange.
- Chapter 5 "Maintenance" on page 14 explains maintenance issues such as receiving data from AEMO, Monitoring your DBMS, and performing software upgrades.
- Chapter 6 "Needing Help" on page 17 provides information to assist participants with IT related issues and provides guidance for requesting assistance from AEMO.
- Chapter 7 "References" on page 19 provides a list of resources referenced throughout this document.

1.5 Related resources

Table 1 below describes the Data Interchange documentation set. Guides are periodically updated, please ensure you are reading the latest version.

Table 1: Data Interchange resources

Name	Description
Guide to Setting up a standard Data Interchange environment	A one page guide with the steps required to setup a standard DI environment.
Data Interchange Guide	A comprehensive guide to Data Interchange that includes options to consider before set up, different configuration

Name	Description
	options, and data recovery options.
Data Subscription Services User Guide	Describes the web-based application in the energy market systems web portal allowing participants to: ■ View a catalogue of all available files. ■ Subscribe to the files containing the data you need to populate your local DBMS. ■ Identify the files you are currently subscribed to. ■ Unsubscribe from files no longer required. ■ Obtain the MMS Data Model scripts for building and maintaining your local DBMS.
Participant Data Replication Batcher User Guide (pdrBatcher)	The pdrBatcher is responsible for moving files between remote and local folders.
Participant Data Replication Loader User Guide (pdrLoader)	The pdrLoader parses AEMO-supplied .CSV files into a local DBMS conforming to the MMS Data Model.
Replication Manager User Guide	Manages the configuration settings and monitors the status of the replication of data from AEMO's systems to a participant's DBMS conforming to the MMS Data Model.
Guide to Troubleshooting Data Interchange	Provides assistance with troubleshooting Data Interchange issues.
MMS Data Model Report	The MMS Data Model is the definition of the interface to participants of data published by AEMO. A DBMS conforming to the MMS Data Model can contain a local copy of all current participant-specific data recorded in AEMO's database. The MMS Data Model includes database tables, indexes, and primary keys.
MMS Data Model Package Summary	
MMS Data Model Table to File to Report Relationships workbook	

1.6 Accessing the software and guides

Data Interchange software and associated documentation are available from the following locations:

- Releases directory on the participant file share: FTP to 146.178.211.25 > Data Interchange, pdrBatcher, pdrLoader, or Replication Manager.
- Data Subscription web application in the energy market systems web portal:
  - Production: https://portal.prod.nemnet.net.au
  - Pre-production: https://portal.preprod.nemnet.net.au
- Data Interchange web page on AEMO's website.

2 About Data Interchange Software

This chapter provides and overview of the Data Interchange software, what it is for, who can you use, and how to use it.

In this chapter:

2.1 What the Data Interchange software is for

Data Interchange is a set of cooperating applications to replicate data between AEMO's Energy Market Systems and participants' local DBMS conforming to the MMS Data Model, including management and monitoring.

Data Interchange has two core functions:

1. AEMO-side reporting applications that generate structured .CSV files into the participant file server.
2. Participant-side software to replicate data from the participant file server to participants' local DBMS.

2.2 Who can use the Data Interchange software

The Data Interchange software is useful for:

- Participants wishing to replicate data between AEMO's energy market systems and their DBMS conforming to MMS Data Model.
- Participants sharing data between participant IDs; for more details about Data Sharing, see Guide to Information Systems.
- Participants having staff with good IT skills, including networking, database management, batch file management, and disaster recovery.

2.3 User rights access

Your company's participant administrator (PA) grants you permission to use the Data Interchange software components in AEMO's web portal. The entities required for access to each component are listed below. Where a participant user has user rights assigned by more than one participant, they interactively choose the participant they represent, using the **Set Participant** option.

For more details about participant administration and user rights access, see Guide to User Rights Management.

2.3.1 Data Subscription

- EMMS - Data Subscription - Maintain and View Data
- EMMS - Data Subscription - View Data

2.3.2 Data Delivery

- EMMS - Data Interchange

2.3.3 Performance Monitor

- EMMS - Data Interchange - Performance Monitor

2.4 How do you use Data Interchange software

AEMO recommends participants set up a standard configuration of Data Interchange, which is a single data feed, from one Participant ID folders on the participant file server, to a single participant database. For example, you can have your pre-production environment connected to the participant file server pre-production environment and your production environment connected to the participant file server production environment.

Under no circumstance point your pre-production environment to the AEMO production environment or vice versa.

AEMO provides working software to participants and each participant is responsible for setting up their own systems and satisfying their requirements for data, including deciding if the complexity of using Data Interchange is a better business decision than using the simpler web portal applications that require only a web browser.

The core processes of Data Interchange are:

1. Participants decide what data they wish to receive using the Data Subscription web application.
2. The data is generated in structured .CSV files into the participant file server.
3. Participant-side Data Interchange software replicates the data from the participant file server to participants' local DBMS.
4. Participants manage their local DBMS and the data feed.

2.5 Requirements

Successfully implementing and managing Data Interchange requires good IT skills, including networking, database management, batch file management, and disaster recovery.

To use Data Interchange requires:

- A user name, password, and user rights, provided by your company's participant administrator (PA), providing access to the Data Interchange web applications in the energy market systems web portal, see "How do you use Data Interchange software" on previous page.

- A DBMS supporting the MMS Data Model. The MMS Data Model supports versions of Oracle and Microsoft SQL Server.

- Java runtime engine suitable for the target DBMS. The distribution file from AEMO contains supported JDBC drivers for Oracle and SQL Server.

- The Replication Manager software runs on Windows OS only, other Data Interchange software components run on both Windows and Unix-like operating systems.

- For accessing the energy market systems web portal, Microsoft Internet Explorer version 7 or later, although the recommended version is Microsoft Internet Explorer 8.

3 Components

Table 2 below describes the components that make up Data Interchange.

Table 2: Data Interchange components

Component	Description
Baseline data	Intended for initial loading into an participant's empty DBMS, to provide key standing data immediately prior to commencing the routine data feed. Participants can fully populate the tables with baseline data by copying each file in the `\MarketData\Baseline` folder into the pdrLoader input folder for the matching source environment, for either production or pre-production.
Data Delivery	The web application in the energy market systems web portal allowing registered participants to: - View the Data Interchange Status Dashboard - Make a file delivery query - Re-request files - View your organisation's data sharing arrangements.
Data Subscription	The web application in the energy market systems web portal allowing registered participants to: - Obtain the latest MMS Data Model scripts for building and maintaining their DBMS - Subscribe and unsubscribe to the report files available in the participant file server - View the entire list of available files. **Note:** AEMO recommends subscribing to all available files and selectively loading them into your DBMS as required. This way the file is created and available if required in the future (approximately 6 months of history is retained online). Unsubscribing from files makes them unavailable in the future.
Data Interchange bundles	All the components necessary for a new installation of Data Interchange are bundled together into compressed files; each bundle is for a specific DBMS and version of the MMS Data Model. The Data Interchange bundles are available from: - The Data Interchange web page on AEMO's website. - The Releases directory: FTP to 146.178.211.25 > Data Interchange.
Historical data	AEMO has monthly and annual historical data available on DVD for subscription. This historical data is intended for historical analysis, kept and processed separately from the current data flows. For more details about obtaining history data and the cost involved, contact AEMO's Information and Support Hub.
MarketNet	All participants must connect to the participant file server using AEMO's private data network—MarketNet, which uses the FTP protocol. The pdrBatcher defaults to use the FTP protocol, simplifying the set-up to access the participant file server.

Component	Description
MMS Data Model	Establishes the target tables in a participant's DBMS conforming to the MMS Data Model, including database tables, indexes, and constraints. It is currently delivered for Oracle and SQL Server. MMS data sets provided from AEMO's pre-production are different from AEMO's production because the environments are operated independently. The MMS Data Model is usually updated with each release for example, new tables or new columns. AEMO recommends participants keep their MMS Data Model up-to-date with new releases to avoid any data loss.
Participant Data Replication Batcher (pdrBatcher)	Responsible for transferring files to and from AEMO's participant file server to the participant's local Data Interchange folders. It can be installed in any environment supporting Java. pdrBatcher is a batch application, therefore does not have a graphical user interface. Configuration of the pdrBatcher is done using the `.properties` file, which is only read when the pdrBatcher starts up, so any changes require a restart of the application. pdrBatcher recovers from network failure to allow for recovery of missing data.
Participant Data Replication Loader (pdrLoader)	Responsible for loading files to and from participant's local Data Interchange folders to the participant's DBMS. It can be installed in any environment supporting Java. pdrLoader polls the participant's local Data Interchange folders and processes data from files into the participant's DBMS conforming to the MMS Data Model. pdrLoader is a batch application, therefore does not have a graphical user interface. Configuration of the pdrLoader is done using the `.properties` file, which is only read when the pdrLoader starts up, so any changes require a restart of the application. pdrLoader has mechanisms to identify and recover missing data.
Participant file server	The publishing point from AEMO systems to participant systems, with each participant allocated an account and access to private and public areas. Each participant is responsible for interfacing with the participant file server. If uncollected, files are moved to the archive folder after a couple of days. If your Data Interchange environment is configured properly it automatically retrieves the missing files from the archive. Files are kept in the archive for approximately six months. AEMO's production and pre-production environments are independently operated, so each environment has its own IP address for its participant file server.
Participant's DBMS	Contains the data received from AEMO into tables matching the MMS Data Model. AEMO's production and pre-production systems are independently operated, so ensure the data from one is not confused with the other. When maintaining the database, ensure compatibility is maintained with the MMS Data Model. Not keeping up-to-date with new releases will compromise the data

Component	Description
	integrity.
Performance Monitor	The web application in the energy market systems web portal allowing registered participants to view a graphical interface of the current Data Interchange Performance Monitor environment run and managed by AEMO. Participants not receiving data, or experiencing data delays can contrast the data delivery performance of their Data Interchange environment to AEMO's Data Interchange performance environment.
Replication Manager	An interactive user interface allowing participants to configure and interrogate the pdrLoader. The software is installed locally on the system administrator's desktop and must run on a Windows operating system but it can access configuration data from any supported DBMS regardless of the store's operating system.

4 Implementation

This chapter explains implementing Data Interchange so all the parts cooperate and are set up correctly. This section is equivalent to a Quick Start guide and explains some basic considerations and the order to install the components. For more detailed information, see the Data Interchange Guide.

In this chapter:

4.1 Hardware specifications

Things to consider include redundancy, number of subscriptions, in-house business requirements, and level of business impact of delay in availability of data, and so on.

The sizing of any server depends on factors such as how much data to keep online, how many concurrent users, what requirement for performance, current and anticipated data volumes, and what data to download. AEMO recommends a capacity planning exercise to establish the appropriately-specified hardware platforms.

The software runs on both 32-bit and 64-bit systems.

4.2 Data volumes

AEMO has the following estimates:

- **No. of files**: 2500 files per day (subscription to all suites and reports).
- **Data volumes**: 1.2 GB monthly of compressed public .CSV files, with private data over and above this.

4.3 Supported database platforms

Versions of Oracle or SQL Server, see Data Interchange for the latest supported versions.

4.4 Before commencing installation

Before commencing to set up your Data Interchange environment, ensure you have the following available:

- Appropriately skilled IT staff.
- A network security design.
- All Data Interchange components for your DBMS, see "Components" on page 7.
- A database administrator or a service provider with a database administrator.
- Your participant ID.
- The IP address for the participant file server, see Guide to Information Systems.
- Your login and password to the participant file server.
- Your login, password, and connection details for your DBMS.
- Your login and password to the Data Subscription web application.

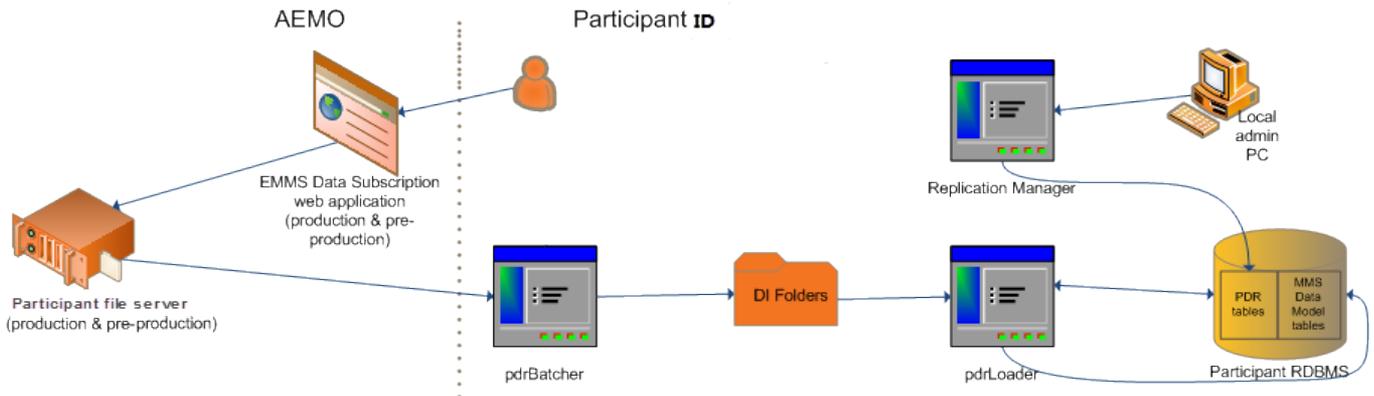## 4.5 Setting up a standard Data Interchange environment

This section explains how to set up a standard implementation of Data Interchange (see Figure 1 on the facing page). AEMO recommend setting up your first Data Interchange environment in pre-production. Once you have a successful pre-production installation (used for testing), you can repeat the installation in production to receive live market data. Be careful to always keep the pre-production and production data entirely separate. .

A standard Data Interchange environment is a single data feed, from one Participant ID folders on the participant file server, to a single participant database. For example, you can have your pre-production environment connected to the participant file server pre-production environment and your production environment connected to the participant file server production environment.

Under no circumstance point your pre-production environment to the AEMO production environment or vice versa. All participants are encouraged to use the pre-production environment to test implementation and to train their participant users, before attempting any changes or operations on the production systems.

AEMO's production and pre-production environments are independently operated, so the set of components shown in the Figure 1 on the facing page are duplicated for production and pre-production.

Figure 1: standard Data Interchange implementation

To set up a standard Data Interchange environment, follow the steps in Table 3 below.

Table 3: steps to set up a standard Data Interchange environment

Step	Do	Reference
1	Download and extract a DI bundle conforming to the MMS Data Model (Oracle or MS SQL Server).	Data Interchange web page on AEMO's website.
2	Set up Data Subscription: ■ Configure report subscriptions using the Data Subscription web application. AEMO recommends subscribing to the full MMS Data Model data set.	*Data Subscription Services User Interface Guide*
3	Create a DBMS instance to conform to the MMS Data Model: ■ Install the DBMS. ■ Install the latest MMS Data Model structure (target tables). Do not make any changes to the MMS Data Model structure.	*MMS Data Model GUI Installer Guide* *MMS Data Model Report*
4	Install and configure the Participant Data Replication Loader (pdrLoader).	*Participant Data Replication Loader User Guide* *Participant Data Replication Loader GUI Installer Guide* *README.txt*
5	Run the pdrLoader application: ■ In Windows, double-click `pdrLoader.bat` file in the `Lib` folder or start the Windows service. ■ In unix-like environments, execute the `pdrLoader.sh` file in the `Lib` folder.	*Participant Data Replication Loader User Guide*
6	Install the MMS Data Model configuration for pdrLoader.	*MMS Data Model pdrLoader Configuration Implementation Note*
7	Install Replication Manager: ■ Extract and install the Replication Manager software on a local PC running Microsoft Windows to monitor and control the operation of the pdrLoader.	*Replication Manager Installation Guide.*

Step	Do	Reference
8	Populate your DBMS with data: ■ Load the baseline data available from the participant file server `\MarketData\Baseline` to your pdrLoader `Reports` folder (baseline data excludes historical data). ■ Load the optional historical data.	Historical data is available on CD from AEMO's information and support hub, phone: 1300 AEMO 00 (1300 236 600), option 2 email: supporthub@aemo.com.au.
9	Install the Participant Data Replication Batcher (pdrBatcher).	*Participant Data Replication Batcher User Guide*
10	Run the pdrBatcher application: ■ In Windows, double-click `pdrBatcher.bat` file in the `Lib` folder or start the Windows service. ■ In unix-like environments, execute the `pdrBatcher.sh` file in the `Lib` folder.	*Participant Data Replication Batcher User Guide*

5 Maintenance

This chapter explains maintenance issues such as receiving data from AEMO, Monitoring your DBMS, and performing software upgrades.

In this chapter:

5.1 File data feed

To receive data from AEMO, do both of the following:

- Subscribe to your required files in the Data Subscription web application. AEMO recommends subscribing to all available files and selectively loading them into your DBMS as required. This way the file is created and available if required in the future (for approximatel 6 months). Unsubscribing from files makes them unavailable in the future.

- Ensure the chosen files are set to be loaded by pdrLoader into your DBMS (using Replication Manager or direct SQL statements).

A file feed can be turned off by either:

- Unsubscribing from the file using the Data Subscription web application. If you unsubscribe from a file, it is no longer delivered to your folder on the participant file server. The file is not produced, so it is not possible to retrieve it at a later date.

- Setting the pdrLoader file load to inactive in your DBMS, using Replication Manager or direct SQL statements. If you set the pdrLoader file load to inactive, the file is still generated and transferred but its content is not loaded to your DBMS. AEMO still maintains a copy of that file in its online archive for up to 6 months, so the file can be re-requested for transfer at a later date.

5.2 Monitoring

5.2.1 Database state

To tell if the database is up-to-date, do any one or more of the following:

- Inspect the PDR_MANIFEST_LOG table directly. For detailed table descriptions, see "Database Tables" in the Participant Data Replication Loader User Guide.
- Query the PDR_REPORT_AUDIT_SUMMARY table for a regularly received report (such as DISPATCHIS). For more details about the PDR tables, see the Participant Data Replication Loader User Guide.
- Query the MMS Data Model tables you expect to have current data (based upon your current subscriptions).
- Use the Replication Manager to show all known data discrepancies in this database. Replication Manager only refers to the PDR tables, with the primary screen looking at the audit table.

5.2.2 Operational checks

AEMO recommends that participants monitor their Data Interchange environment to ensure smooth operation. Key monitoring points include:

- Build up of files in your participant Data Interchange folders.
- Space monitoring at the database and file system levels.
- Log file inspection of the pdrBatcher and pdrLoader processes.
- Timeliness of specific tables in your DBMS.
- Running queries against the PDR tables.

For assistance with any issues, see the Guide to Troubleshooting Data Interchange.

5.3 Upgrades

Participants are required to implement upgrades to their Data Interchange systems in line with each release. AEMO supports only the latest and previous versions of Data Interchange components. To ensure no loss of data, AEMO recommends participants schedule resources to maintain their environment and ensure it is current with AEMO Data Interchange software releases.

For each new release, do the following:

- Subscribe to any new files relevant to your business, or choose the latest file set for the MMS Data Model in the Data Subscription web application.

- Download and apply the scripts to upgrade your DBMS.

- Ensure the reports are activated to load to the database.

- Confirm the latest files are being delivered and loaded correctly.

- Unsubscribe from legacy files.

Details about the changes affecting participants in new Data Interchange software are detailed in the Technical Specification delivered to participants before each release.

5.3.1 Tests for successful upgrade

To check a configuration update is applied, identify a new table that is supposed to be added for the new version of the MMS Data Model and run a query like:

select count(1) from PDR_REPORT_RECORDS where DESTINATION_ TABLE='<NameOfNewTable>';

If the query returns 0 rows, then the MMS Data Model pdrLoader configuration has not run successfully.

To check that a report is activated to load to the database, either:

- Right click in the Replication Manager front screen and check the desired report. You can activate reports on this screen too.

- Check the IS_ACTIVE status in table PDR_REPORT_TYPE_CONFIG for the desired report, using SQL. You can activate a report by setting the status, using SQL, too.

6 Needing Help

6.1 AEMO's Information and Support Hub

6.1.1 Contacting AEMO's Information and Support Hub

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.

6.1.2 Information to provide AEMO

Please provide the following information when requesting 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)

6.2 Feedback

To suggest improvements to this guide, please contact the AEMO Information and Support Hub.

7 References

The resources listed in this section contain related information that may assist you.

7.1 AEMO's website

- "Data Interchange", the web page containing all software and documentation relating to the Data Interchange components: http://www.aemo.com.au/About-the-Industry/Information-Systems/Data-Interchange (Home > About the Industry > Information Systems > Data Interchange).

- *Guide to AEMO CSV Data Format Standard*, http://www.aemo.com.au/About-the-Industry/Information-Systems/Using-Energy-Market-Information-Systems (Home > About the Industry > Information Systems > Using Energy Market Information Systems).

- *Guide to Information Systems,* http://aemo.com.au/About-the-Industry/Information-Systems Home > About the Industry > Information Systems).

- *Guide to Troubleshooting Data Interchange*, provides assistance with troubleshooting Data Interchange software issues: http://www.aemo.com.au/About-the-Industry/Information-Systems/Data-Interchange#DI Guides (Home > About the Industry > Information Systems > Data Interchange).

- *Guide to User Rights Management,* http://www.aemo.com.au/About-the-Industry/Information-Systems/Using-Energy-Market-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).

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