Short Term PASA Procedure

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NOTE: This consultation draft is for the ST PASA replacement targeted to go live in August 2026.

This is a complete replacement of the existing procedure and is not change marked.

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Current version release details

Version	Effective date	Summary of changes
PRP Draft	31 August 2026	Rewritten for ST PASA replacement project

Note: There is a version history at the end of this document.

1. Introduction

The Projected Assessment of System Adequacy (*PASA*) is a comprehensive program of information collection, analysis and disclosure of medium term and short term *power system security* and reliability of *supply* prospects so that *Registered Participants* are properly informed to enable them to make decisions about *supply*, demand and *outages* of *transmission networks* in respect of periods up to 2 years in advance (or up to 3 years in advance, where specified) (the **PASA objective**).[1]

AEMO prepares *PASA* in two timeframes:

(i) *short term PASA* (ST PASA)[2] covers each *30-minute period* in at least the seven *trading days* from and including the day of *publication*; and

(ii) *medium term PASA* (MT PASA)[3] covers the 24-month period (or in some cases the 36-month period) commencing from the Sunday after the *day* of publication with a daily resolution.

This procedure is developed by AEMO under NER 3.7.3 to describe the preparation of ST PASA for market participants and includes the processes and methodologies that AEMO applies to produce ST PASA information, after completion of the PASA Replacement Project[4] in 2026.

1.1. Purpose

This ST PASA procedure (Procedure) is a part of the **ST PASA procedures** made under 3.7.3(c) of the National Electricity Rules (NER). The **ST PASA procedures** are:

- This Procedure.
- Spot market operations timetable section 2.2 PASA.
- Reliability standard implementation guidelines section 2.3 Projected Assessment of System Adequacy.
- Reserve level declaration guidelines.
- SO_OP_3703 Short Term Reserve Management.

Section 0 provides references to these and other related documents.

1.2. Scope

This Procedure provides the following information:

[1] NER 3.7.1(b).

[2] NER 3.7.3.

[3] NER 3.7.2. The MT PASA Process Description is available at: https://aemo.com.au/-/media/files/stakeholder_consultation/consultations/nem-consultations/2023/reliability-forecasting-guidelines-and-methodology-consultation/final/mt-pasa-process-description.pdf?la=en.

[4] Information on ST PASA Replacement project is available at https://aemo.com.au/initiatives/trials-and-initiatives/st-pasa-replacement-project

- How AEMO will prepare inputs for the *short term PASA* reflecting the factors outlined in NER 3.7.3(g).
- The processes or methodologies AEMO will apply to produce the *short term PASA* information.
- The detailed *short term PASA* information AEMO will *publish* to meet the requirements of NER 3.7.3(k).
- The period to be covered by the *short term PASA* in accordance with NER 3.7.3(b).
- Any other information that AEMO considers reasonably necessary to implement the PASA objective, having regard to the costs and benefits of collecting the relevant information.

The scope does not include processes that follow each *short term PASA* run (such as declaration of conditions, reserve trading and market intervention)[5].

1.3. Definitions and interpretation

1.3.1. Glossary

Terms defined in the National Electricity Law and the NER have the same meanings in this Procedure unless otherwise specified in this clause.

Terms defined in the NER are intended to be identified in this Procedure by italicising them, but failure to italicise a defined term does not affect its meaning.

In addition, the words, phrases and abbreviations in the table below have the meanings set out opposite them when used in this Procedure.

Term	Definition
BDU	*Bidirectional Unit*
CSV	Comma-separated values; a file format for exchanging data using commas as delimiters.
DB	Database
EMMS	Electricity Market Management System; software, hardware, network and related processes to implement the NEM
LHS	Left hand side of a constraint equation
LOR	Lack of reserve condition
MMS	Market Management System (see EMMS)
NER	National Electricity Rules; a specified clause or paragraph from the NER
Node	The point of connection of equipment used in the power system model of the ST PASA engine, including *scheduled resources*, lines and transformers. Forecasts of demand and generation are prepared at the node level. *Scheduled resources* are dispatched at the node level.
NOS	Network Outage Scheduler
PASA	*Projected Assessment of System Adequacy*. Defined in NER 3.7.
POE	Probability of exceedance
Recall period	Offered recall period of each *scheduled resource* (excluding *semi-scheduled generating units)* associated with its *PASA Availability* for each 30-minute *period.*

[5] Refer SO_OP_3703 Short term reserve management. Available at https://aemo.com.au/energy-systems/electricity/national-electricity-market-nem/system-operations/power-system-operation/power-system-operating-procedures.

Term	Definition
RHS	Right hand side of a constraint equation
RLDG	Reserve Level Declaration Guidelines
RSIG	Reliability Standard Implementation Guidelines
ST PASA	*Short Term PASA* as defined in NER 3.7.3.
ST PASA engine	Mathematical model, software, inputs and the outputs of the ST PASA replacement tool
ST PASA procedures	This Procedure and relevant parts of SO_OP_3703, RSIG, RLDG, spot market operations timetable (see section 1.1).
UIGF	*Unconstrained Intermittent Generation Forecast* of semi-scheduled generation
UM	Uncertainty margin applied to each forecast node and generation node
Zone	An area determined by AEMO being served by a part of the transmission network containing a group of nodes. Zones in ST PASA are used to subdivide *regions* for reporting areas of common supply deficits.

1.4. Related documents

Title	Location
Reliability Standard Implementation Guidelines (RSIG)	https://aemo.com.au/en/energy-systems/electricity/national-electricity-market-nem/nem-forecasting-and-planning/forecasting-and-reliability/reliability-standard-implementation-guidelines
Reserve Level Declaration Guidelines (RLDG)	https://www.aemo.com.au/-/media/Files/Electricity/NEM/Security_and_Reliability/Power_System_Ops/Reserve-Level-Declaration-Guidelines.pdf
SO_OP_3703 - Short Term Reserve Management	https://aemo.com.au/energy-systems/electricity/national-electricity-market-nem/system-operations/power-system-operation/power-system-operating-procedures
Spot Market Operations Timetable	https://aemo.com.au/en/energy-systems/electricity/national-electricity-market-nem/market-operations/dispatch-information
SO_OP_3707 Intervention, Direction and Clause 4.8.9 Instructions	https://aemo.com.au/energy-systems/electricity/national-electricity-market-nem/system-operations/power-system-operation/power-system-operating-procedures
Demand Terms in EMMS Data Model	https://www.aemo.com.au/-/media/Files/Electricity/NEM/Security_and_Reliability/Dispatch/Policy_and_Process/Demand-terms-in-EMMS-Data-Model.pdf
SO_OP_3718 Outage Assessment	https://aemo.com.au/-/media/files/electricity/nem/security_and_reliability/power_system_ops/procedures/so_op_3718-outage-assessment.pdf?la=en&hash=CB561525DFE62EDD6627EF137C13833C
SO_OP_3719 Procedure for Submitting Recall Information of Scheduled Generator Outages	https://aemo.com.au/-/media/files/electricity/nem/security_and_reliability/power_system_ops/procedures/so_op_3719-procedure-for-submitting-recall-information-scheduled-generator-outages.pdf
NEM Operational Forecasting and Dispatch Handbook for wind and solar generators	https://aemo.com.au/-/media/files/electricity/nem/security_and_reliability/dispatch/policy_and_process/nem-operational-forecasting-and-dispatch-handbook-for-wind-and-solar-generators.pdf

2. Short Term PASA Inputs

2.1. AEMO inputs

Under clause 3.7.3(g) of the NER, AEMO is required to prepare the following information for input to the ST PASA for each *30-minute period*;

- Forecast *load* and *unscheduled generation*, taking into account forecasting uncertainties.
- Forecast availability of *scheduled resources*, including any applicable *constraints*.
- Forecast *network constraints* and notified *network outages*.
- Any other factors AEMO considers relevant having regard to the PASA objective.

AEMO also prepares the following information as input into the ST PASA for each *30-minute period*;

- Demand forecasts for each node.
- Demand and supply forecast uncertainty margins for each node.
- Forecast network outages and *constraints* using the network outage schedule information provided by transmission network service providers (TNSPs).
- *Unconstrained intermittent generation forecasts* (UIGFs) for *semi-scheduled generating units*.

2.2. Participant inputs

Under clause 3.7.3(h) of the NER, each *Registered Participant* is required to prepare the following information for input to the ST PASA:

- *Available capacity* of each *scheduled resource* for each relevant *30-minute period*.
- *PASA availability* of each *scheduled resource* for each relevant *30-minute period* (refer Section 3.3).
- *Energy constraints* or *wholesale demand response constraints* (as applicable) for *scheduled generating units*, *scheduled bidirectional units*, *scheduled loads* or *wholesale demand response units*.

In practice, this information is provided using the spot market bidding systems. AEMO uses values from the last trading interval in each *30-minute* period.

PASA Availability

This information will be used when determining options for *directions* to manage reserve conditions (i.e. projected failure to meet the reliability standard, assessed in accordance with the reliability standard implementation guidelines).

Recall period associated with the *PASA Availability*

The recall period associated with the *PASA Availability* values is in hours and must be greater than or equal to zero. The maximum value that AEMO systems will accept is 24,000 hours, which is equivalent to 1,000 days and consistent with the maximum value used in MT PASA. The maximum value is also the default value.

If left empty, then AEMO's system will default to 24,000 hours and the plant will not be considered available for recall. If 0 hours is entered, AEMO will consider the PASA available physical plant is immediately recallable. Other non-numeric values such as NULL, TAB and SPACE will be bid rejected.

Recallable plant capability with recall periods greater than 168 hours (7 days) is beyond the ST PASA timeframe and is therefore not used for operational decision making in ST PASA.

Appendix A explains data integrity requirements to be adhered to when submitting recall periods.

3. ST PASA solution process

3.1. Full Network representation

The ST PASA uses a full-network model of the *power system* taken from the real-time energy management system, planned network outages taken from the network outage scheduler (NOS), and *available capacities* of *scheduled resources* taken from NEM bids (excluding *wholesale demand response units*).

The assessment is undertaken for each node in the network, and then aggregated into zones and *regions*. Aggregated information is provided to participants and to AEMO for declaring reserve conditions and to follow subsequent processes.

3.2. ST PASA engine

The ST PASA engine uses proprietary software developed by GE Vernova with customisations to suit the specific requirement of the NEM.

The main features of the ST PASA engine are shown in Table 1.

Table 1 Main features of ST PASA engine

Feature	Description
Objective	Create a generation profile that meets the demand at each node in the full network model
Subject to	n-1 security constraints for any network configuration and a set of transmission and generation contingencies
Demand used	50% probability of exceedance demand plus uncertainty margin less estimated grid losses disaggregated to each node Refer section 3.3.8.
Supply side model	Security constrained economic dispatch, using spot market bid *available capacity* profiles and the associated energy constraints, or *Unconstrained Intermittent Generation Forecasts* if appropriate, less uncertainty margin, less estimated auxiliary load. The economic dispatch model uses band prices and volumes from spot market bids.
Network constraints	ST PASA engine will automatically produce thermal limit constraints each time the ST PASA engine is run. Other power system security constraints (such as for stability) will be taken from the constraints invoked for the central dispatch process.
Reliability measure	Deficit = demand (plus uncertainty margin) – supply (less uncertainty margin)
Reserve level declarations	Lack of reserve levels based on levels of deficit reported in the base, reliability and warning runs (see section 3.3.2) consistent with the Reserve Level Declaration Guidelines.
Components	The ST PASA engine iterates between a linearised network power flow and optimal dispatch.

3.3. Overview of modelling approach

3.3.1. Security constrained economic dispatch

The ST PASA engine aims to provide a security constrained dispatch schedule for 7 days ahead that can identify potential security and reliability of supply issues.

3.3.2. Supply reliability assessment and ST PASA engine runs

ST PASA assessment is carried out with a 7-day outlook, with reporting based on the collective results from the 'Base', 'Reliability' and 'Warning' runs for each zone to indicate potential risks of inadequate supply. The ST PASA engine will be run several times to produce separate assessments of each risk:

- 'Base' run – the adequacy of supply with no contingencies and allowing for a given uncertainty margin. AEMO may intervene if there is no market response to alleviate the condition.
- 'Reliability' run – the adequacy of supply following a credible contingency allowing for the same uncertainty margin as for the Base run. AEMO may intervene if there is no market response to alleviate the condition.
- 'Warning' run – the adequacy of supply following a credible contingency allowing for higher uncertainty margins.

3.3.3. Scheduled resources

Supply side

Bid *available capacity* of *scheduled resources*, including any applicable *constraints*:

- Bid *available capacities* are taken from the last *trading interval* in each *30-minute period*.
- For *semi-scheduled generating units*: minimum (*Available Capacity*, UIGF).

Bid ramp rates are observed by the ST PASA engine, noting that *30-minute* intervals will not tend to forecast ramp-rate supply deficits or surpluses as often as 5-minute intervals. Bids in the NEM do not have explicit minimum output limits for *scheduled resources* and the ST PASA engine will normally allow those *scheduled resources* to be dispatched to zero.

PASA availability of resources are not used by the ST PASA engine.

Load side

Scheduled loads are dispatched according to market bid information and not considered to be part of the demand forecast input to the ST PASA engine. As with spot market dispatch, normally on *scheduled loads* (such as industrial processes) are subtracted from the demand forecast and dispatched according to market bids. Normally off *scheduled loads* (such as pumped hydro) are dispatched according to their market bids.

Generally, the ST PASA engine will not dispatch the consumption of *scheduled loads* if that triggers a supply deficit condition, as this would violate supply-demand balance equations built into the model.

3.3.4. Demand forecasts

AEMO will prepare demand forecasts for approximately 1,700 nodes in the NEM. It will be based on a 50% probability of exceedance (POE); embedded generation will be subtracted to produce a net demand forecast at each node.

Nodal demand is equal to 50% POE plus uncertainty margin (UM) less estimated grid losses disaggregated to each node.

3.3.5. Energy constrained plant

Some *generating plant* cannot generally operate at maximum capacity indefinitely, otherwise their energy source will be used up. Such plant is known as energy limited plant. They offer daily energy constraints as part of their bids.

The ST PASA engine has the functionality to incorporate energy constraints for any duration within its study period. The energy will be dispatched based on prices and volumes from market bids.

3.3.6. Bidirectional units (BDUs)

BDUs are dispatched according to bids provided into the *spot market*. The ST PASA engine has the functionality to optimally charge and discharge BDUs within *energy constraints* provided in bids to

alleviate supply surpluses and deficits where needed. There is no inherent limit in the model for BDU cycling within the ST PASA outlook period.

3.3.7. Wholesale demand response units

Wholesale demand response units are not modelled in the ST PASA. Contributions from *wholesale demand response units* to reliability assessments are modelled via adjustments to demand forecasts

3.3.8. Uncertainty margins

The uncertainty margin for each demand and supply node is an amount of megawatts (MW) that represents the expected *conditional* forecast error for a specified *confidence level*:

- *Conditional* because the size will change depending on factors such as weather, hours or days ahead, demand types, or fuel types.
- *Confidence level* – a 95% confidence level means 19 times out of 20 the forecast error will not exceed this value.

Uncertainty margins at each supply node and for *scheduled resources* will be determined using a statistical 'backcasting' methodology. The confidence levels are adjusted to balance the number of shortfalls against risk of shortfalls. The uncertainty margins will be added to demand forecasts and resource capacities before each ST PASA run.

The methodology for determining the uncertainty margins and its application in ST PASA are matters for ST PASA consultation 2.

3.3.9. Power system operations

The ST PASA engine has the following *power system* operations functions:

- Full integration with AEMO's energy management and SCADA, market bidding, and network outage scheduler.
- Automatic creation of base and post-contingent thermal *constraints.*
- Use of voltage and stability *constraints.*
- Multi-island operation and reporting.
- Voltage and load control scheduling.
- Automatic switching from AC to DC power flow where required to improve power flow solution convergence.
- Incorporation of planned and unplanned network and supply-side outages and restorations.
- *Scheduled resource* contingencies and restorations.
- Modelling reliability impacts of partial outages of aggregated combined cycle generators.
- Automatic detection and removal of radial line contingencies from reliability assessment.

3.4. Short Term PASA Process

The details of the ST PASA process are as follows.

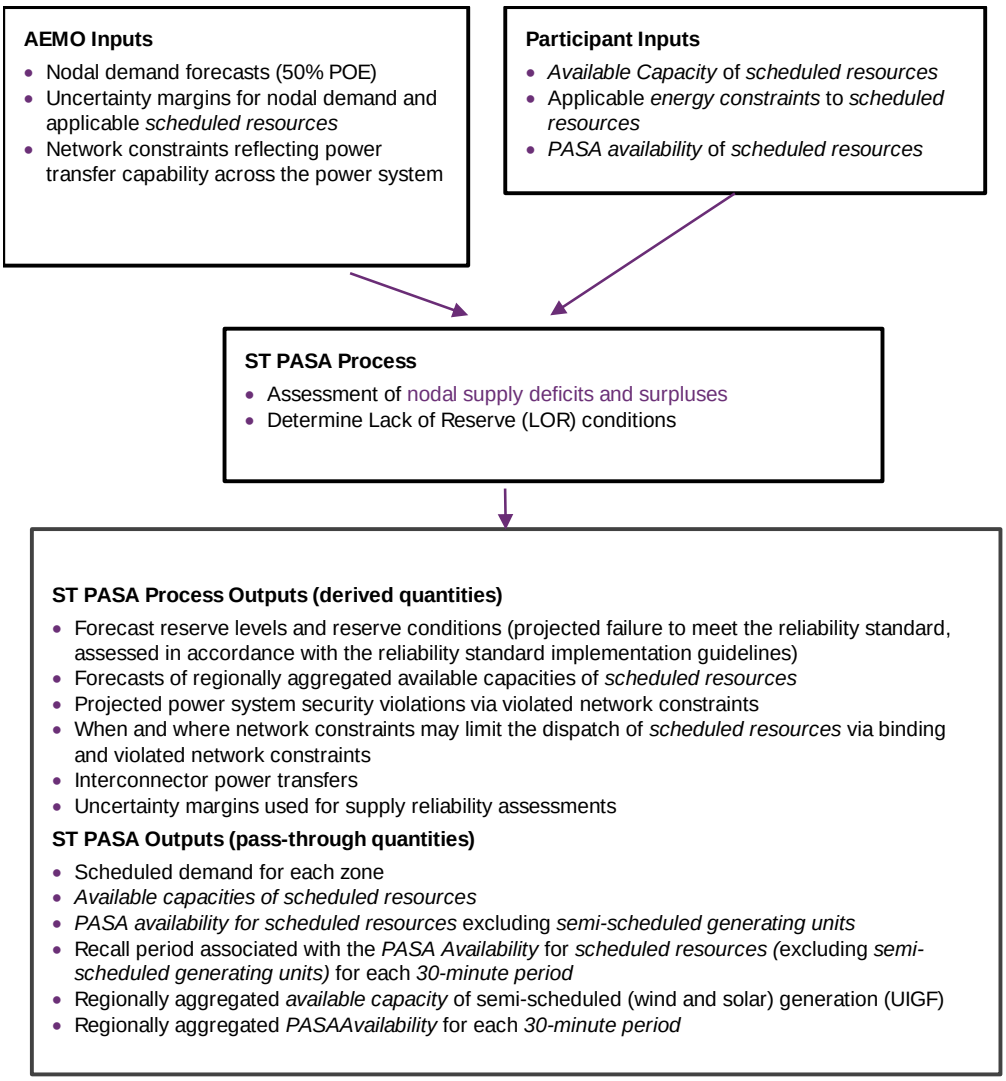
- ST PASA participant-provided data is taken from the spot market bidding system.
- The ST PASA process is initiated by PASA Orchestrator. The outlook period starts from the next *30-minute* period until end of the seventh trading day (for example, if today is Monday the ST PASA outlook is until 04:00 hours next Monday).
- The PASA Pre-processor and PASA Engine Interface are used to create the input files for the ST PASA engine, which solves the case.
- The PASA engine writes its solution to output files (PASA Solver Solution file). The PASA output file triggers PASA Engine Interface and Post-processor and writes the solution into the NEM Database.
- Post processing of PASA outputs will aggregate the results by zones and *regions* and be published to *Market Participants.*
- Another automatic process replicates ST PASA solution data to the Participant File Share. AEMO publishes ST PASA outputs via:
  - PD PASA and ST PASA NEM Reports (via Data Interchange) if subscribed.
  - Participant Data Model tables (uses these NEM Reports).
  - AEMO Market Data NEMWeb[6].
  - AEMO Markets Portal (Web Portal)[7].

Figure 1 summarises the operation of the ST PASA engine. The following provides additional specific information on those processes.

[6] AEMO Market Data NEMWeb can be accessed at https://aemo.com.au/energy-systems/electricity/national-electricity-market-nem/data-nem/market-data-nemweb.

[7] AEMO Markets Portal can be access at https://portal.prod.nemnet.net.au/#/. Participants must communicate with AEMO Support Hub obtain access to AEMO Market Portal.

Figure 1 ST PASA Processes



4. Short Term PASA outputs

ST PASA is published according to the spot market operations timetable.

The published outputs of the supply reliability assessment are as follows.

- Demand forecasts for each zone and *region*.
- Uncertainty margins for each zone and *region*.
- Zonal supply deficit conditions for 'Base', 'Reliability' and 'Warning' runs and three levels of Regional lack of reserve (LOR) conditions.
- Binding network constraints from 'Base', 'Reliability' and 'Warning' runs.

For specific details of the data contained in the ST PASA Public.csv file, please refer to the Market Management System (MMS) data model document published on the AEMO website.

A complete list of ST PASA outputs will be included in this Procedure after completion of Consultation 2.

Appendix A. Data integrity requirements for submitting recall period

There is a data integrity requirement to be adhered in submitting recall periods. Recall periods can have a maximum of 2 decimal places with recall periods greater than 2 decimal places will be bid rejected.

Table 2[8] summarises AEMO's interpretation of recallable capacities (*PASA Availability* minus Available Capacity) and recall periods.

Table 2 AEMO interpretation of recallable capacities and recall periods

Availability (MW)	Recall period (hours)	AEMO interpretation	Published recall period (hours)
PASAAvailability > Available Capacity	0	Bid accepted. Recallable capacity is immediately available.	0
PASAAvailability = Available Capacity	30,000	Bid rejected. An error message will be issued, as recall period exceeds the maximum limit of 24000 hours.	Participant needs to re-submit the bid.
PASAAvailability > Available Capacity	0.5	Bid accepted. Recallable capacity is available in 0.5 hours. Up to 2 decimal places will be accepted, bid will be rejected for 3 or more decimal places.	0.5
PASAAvailability > Available Capacity	168	Bid accepted. Recallable capacity is available within ST PASA period, which is 7 days (168 hours).	168
PASAAvailability > Available Capacity	48	Bid accepted. Recallable capacity is available with 2 days (48 hours) notice.	48

Table 3 Further details on submissions of recall period (via API Submission)

Recall period (hours) entered by participant (hours) via API Submission	AEMO interpretation	Published recall period (hours)
Recall Period attribute is defined, but its value is left blank, e.g. -"recallPeriod": Recall Period attribute is defined, but its value is non-numeric, or a string enclosed in quotes, e.g. -"recallPeriod": <tab key>, -"recallPeriod": "<space key>", Recall Period attribute is defined, but its value is a null character (ascii CHR(0))	Bid rejected. An error message will be issued, Recall Period must be an integer or a decimal number with no more than two decimal places, between 0 and the pre-defined Max Limit of 24000.	Participant needs to re-submit the bid.
no value defined / removed for an interval	Bid accepted. Recall Period value will default to 24000 hours (maximum value). There is no recallable capacity.	24,000

[8] These examples are not exhaustive, refer to AEMO bid validation rules for more information.

Table 4 Further details on submissions of recall period (via Web portal)

Recall period (hours) entered by participant (hours) via Web Portal	AEMO interpretation	Published recall period (hours)
<blank>	Bid accepted. Recall Period value will default to 24000 hours (maximum value). There is no recallable capacity.	24,000
<space> 'non-numerical value'	Bid rejected. An error message will be issued, Recall Period must be an integer or a decimal number with no more than two decimal places, between 0 and the pre-defined Max Limit of 24000.	Participant needs to re-submit the bid.

Version release history

Version	Effective date	Summary of changes
PRP Draft	31 August 2026	Rewritten for ST PASA replacement project
007	31 July 2025	Retitle document from ST PASA Process description to ST PASA Procedure. Updates as per National Electricity Amendment (Updating Short Term PASA) Rule 2022 No. 4. Clarifications to address consultation submissions.
006	15/03/2012	ST PASA Process Description updated to reflect changed process (removal of the System (NEM) LRC run
005	25/05/2011	ST PASA Process Description updated: • Included semi-dispatch. • Updated section 3. • Updated section 5. • Deleted old references. • Corrected typos.
004	01/07/2010	Change to AEMO document