

PROCEDURE FOR THE DISPATCH AND ACTIVATION OF RESERVE CONTRACTS

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DOCUMENT REF: SO_OP3717

VERSION: 4

DATE: 28 June 2011

FINAL

Version Release History

VERSION	DATE	AUTHOR	CHECKER	APPROVER	COMMENTS
4	09/06/11	R Rigoni	F Boros	H Gorniak	Revised template. Added disclaimer. Added <i>Affected Participants</i> and intervention pricing. Modified Management of Reserve Conditions.
3	30/11/09	B Webb	T van der Walt	H Gorniak	Interim Amendments
2	22/05/09	T van der Walt	Paul Ryan	Paul Ryan	Version consistent with the final determination of <i>RERT</i> consultation
1	17/02/09	T van der Walt	Paul Ryan		First Draft for Rule Consultation

This document has been created by the Power System Operations Division and will be reviewed from time to time.

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1 Introduction

AEMO has published the final Procedure for the Exercise of Reliability and Emergency Reserve Trader (*RERT*)¹ that details the process AEMO will follow when exercising the *RERT*.

The operation of the *RERT* is divided into the following two stages:

- (1) Stage 1: when AEMO is determining whether to enter into contracts for the provision of additional reserves under clause 3.20.3; and
- (2) Stage 2: when AEMO is considering whether to *dispatch scheduled reserves* under *scheduled reserve contracts* or *activation of unscheduled reserves* under *unscheduled reserve contracts* under clause 3.20.7.

2 Purpose

The purpose of this Procedure is to detail how AEMO will exercise Stage 2 of the *RERT* - Dispatch and Activation.

3 Application

This Procedure applies to everyone in AEMO charged with the responsibility for the *dispatch* and *activation of reserves* under *reserve contracts*.

4 Legal and Regulatory Framework

Clause 3.20.7(e) of the NER requires the publication of procedures by which the *RERT* will be exercised under clause 3.20. AEMO takes this to mean that it must detail all the processes AEMO will undertake from the moment a *reserve* shortfall has been forecast in one or more *regions*, through to the procurement and entry into *reserve contracts* and the *dispatch of scheduled reserve*, or *activation of unscheduled reserve*.

5 Related Policies and Procedures

- Procedure for the Exercise of Reliability and Emergency Reserve Trader – Final (AEMO Website dated 24 Nov 2010)
- Reliability and Emergency Reserve Trader (*RERT*) Guidelines.

6 Definitions and Interpretation

In this Procedure, a word or phrase *in this style* has the same meaning as given to that term in the NER.

Unless the context otherwise requires, this Procedure will be interpreted in accordance with Schedule 2 of the *National Electricity Law*.

¹ Version 3 dated 23/11/10, refer <http://www.aemo.com.au/electricityops/rert.html>

7 Management of Reserve Conditions

In order to assess whether *reserve* will be required to be *dispatched* or *activated* AEMO will monitor:

- The outcome of the *short term PASA*; and
- The *pre-dispatch schedule* outcomes in terms of the anticipated available *reserve*; and
- Any other information AEMO reasonably identifies to be necessary.

AEMO may declare the following conditions in relation to a period of time, either present or future:

- *Low reserve* condition (LRC)
- *Lack of reserve 1* (LOR1)
- *Lack of reserve 2* (LOR2)
- *Lack of reserve 3* (LOR3)

AEMO must *publish* any declaration of any of the above conditions and include the nature and extent of the reserve condition and the time period over which the condition applies.

When a declaration of a condition is published then AEMO must:

- *Publish* a notice of any forecast circumstances that may require AEMO to implement a *AEMO intervention event*
- Estimate and *publish* the latest time at which AEMO would need to intervene through a *AEMO intervention event* should there be an inadequate response from the market to avoid the need for the *AEMO intervention event*

In order to estimate the latest time to intervene AEMO may request information from a *Scheduled Network Service Provider*, *Scheduled Generator*, *Semi-Scheduled Generator* or *Market Customer*.

Such information may include but not be limited to:

- *Plant* status
- Details of *plant outages* which may affect MW capacity and an indication of the possible deferral of such *outages*
- Estimates of relevant costs incurred if it is considered by AEMO reasonably likely that the *Scheduled Network Service Provider*, *Scheduled Generator* or *Market Customer* will be subject to a *direction*

AEMO must regularly review the estimate of the latest time at which it would need to intervene and *publish* any such revisions.

If the latest time for an *AEMO intervention event* is reached and the condition still exists then AEMO must *publish* a notice advising that the time for negotiation of further *reserve contracts* in accordance with clause 3.20 of the NER has elapsed and that it intends to implement a *AEMO intervention event*.

Any *reserve* available under *reserve contracts* should be *dispatched* or *activated* prior to the issuing of *directions*.

8 Power System Security Events

Section 9 of the *RERT* guidelines state that AEMO may *dispatch* or *activate* reserves under *reserve contracts* to address a *power system security* event in a *transmission network* that it has oversight for if:

- there are suitable *reserves* that AEMO has contracted under the *RERT* for long or medium-notice situations at an appropriate location, and there is sufficient notice of the *power system security* event to allow AEMO to *dispatch* or *activate* these *reserves*; or
- there are suitable *reserves* that AEMO can contract under the *RERT* for short-notice situations at an appropriate location, and there is sufficient notice of the *power system security* event to allow AEMO to *dispatch* or *activate* these *reserves*.

9 Determining the Latest Time for Dispatching or Activating Reserve

The latest time to *dispatch* or *activate reserve contracts* will be determined from the specified lead times of the contracted reserve services in order to maintain *power system security* and to ensure reliability of supply by first minimising LOR3 conditions and then LOR2 conditions.

Example:

A case may exist where there is inadequate *reserve* in a single *region* or set of *regions* where the loss of the largest *generating unit* in the *region* or set of *regions* would violate the secure operating limit of the *interconnector*. Manual *load shedding* would then be required to remove the *violation* within 30 minutes. In this case, forecast LOR2 would be the trigger to *dispatch* or *activate* these *reserves* where the response time of the reserve service exceeds 30 minutes.

In cases where the response time for the reserve service is less than 30 minutes, the *dispatch* or *activation* may generally not be required until after the contingency occurs. Hence the timing of the *dispatch* or *activation* depends on the characteristics of the contracted reserve.

10 Declaration of Intervention Price Dispatch Interval

Where an AEMO *intervention event* occurs AEMO must declare that *dispatch interval* to be an *intervention price dispatch interval*.

This declaration is independent of whether or not intervention pricing has been initiated.

11 Declaration of Intervention Pricing

The test for if the intervention price run should be initiated for a AEMO *intervention event* is:

- Could the issue that required the intervention be resolved by the *dispatch* or *activation* of the *reserve contracts* at the *regional reference node*? If YES, then initiate intervention pricing.

12 Intervention Constraints

If intervention constraints are invoked then the *dispatch algorithm* performs an intervention price run. Intervention constraints are ignored in the intervention price run, and this sets the *dispatch price* and *ancillary service prices* to that which would have occurred had AEMO not intervened in the *market*.

13 Affected Participants

To minimise the number of *Affected Participants*, AEMO may select *Market Participants* to become *Affected Participants*.

This is referred to as a counter action.

AEMO will only select *Market Participants* to become *Affected Participants* if intervention pricing is initiated.

The NER definition of *Affected Participant* does not allow a *semi-scheduled generating unit* to be an *Affected Participant*.

14 Effect on Interconnector Flows

AEMO will attempt to minimise the effect on interconnector flows.

Selecting *Market Participants* to become *Affected Participants* in the *region* where the *reserve contract* is *dispatched* or *activated* will minimise the effect on interconnector flows.

15 Methodology to Dispatch and Activate Reserve Contracts

15.1 RERT Principles

Rule 3.20.2 contains AEMO's obligations with respect to the management of *reserve*:

- AEMO must take all reasonable actions to **ensure reliability of supply** and, where practicable, take all reasonable actions to **maintain power system security** by negotiating and entering into contracts to secure the availability of *reserves* under *reserve contracts* (reliability and emergency reserve trader or *RERT*)
- actions taken should be those which AEMO reasonably expects, acting reasonably, to have the **least distortionary effect** on the operation of the *market*; and
- actions taken should aim to maximise the effectiveness of *reserve contracts* at the **least cost to end use consumers of electricity**

AEMO will *minimise* the distortionary effect on the operation of the market by, in so far as is reasonably practical, minimising the number of *Affected Participants* and the effect on interconnector flows using counter action.

AEMO will evaluate all short notice *RERT* tenders as between themselves and as against all existing *reserve contracts* in order to ensure that *reserve* is procured at the least possible cost to the *market*.

15.2 Communication

AEMO will issue instructions to *reserve providers* in accordance with each applicable *reserve contract*.

15.3 Selecting Reserve Blocks

There may be some *reserve* that cannot be used in a particular instance, for example, because binding network constraints prevent access to the *reserve* or there may be insufficient time to use the *reserve* because the *reserve* condition was forecast at sufficiently short notice compared to the *reserve's* lead time for *dispatch* or *activation* that there would be no benefit in using it. Such *reserve* will not be considered for *dispatch* or *activation*.

Selection of the particular *reserve* to be *dispatched* or *activated* will be based on a number of factors including, but not limited to the following:

- ability to meet the requirement

- cost
- size of *reserve* blocks
- length of *dispatch* or *activation* times
- *dispatch* or *activation* constraints (for example, maximum number of days or consecutive days per week of *dispatch* or *activation*, maximum and/or minimum periods of *dispatch* or *activation*)
- shutdown periods when the *reserve* blocks are not available.

16 Dispatch of Scheduled Reserve

Scheduled plant is registered in the AEMO Market Management System (MMS) with a unique Dispatch Unit Identification (DUID). Dispatch of *scheduled reserve* is through normal market processes using constraint equations which include the relevant DUIDs.

16.1 Key Terminology

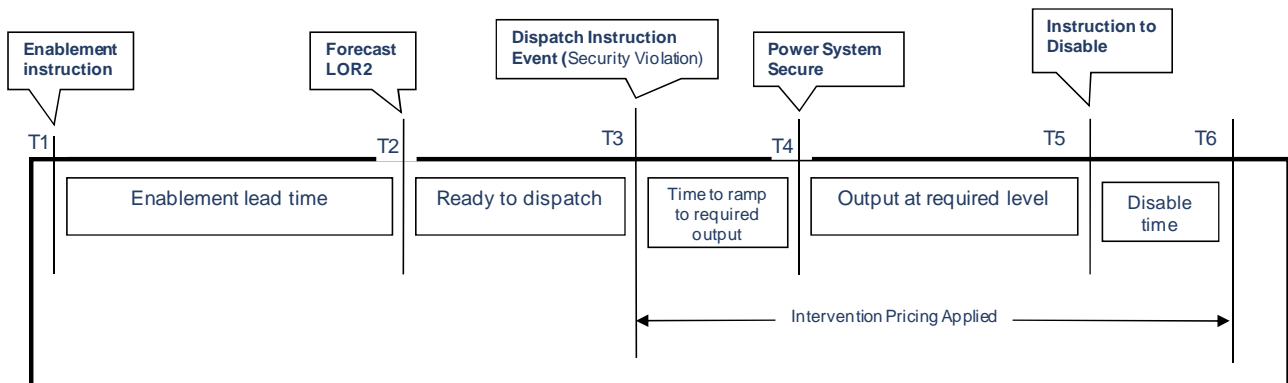


Figure 1: Timeline for fast response reserve (Forecast LOR2 from T2 to T5)

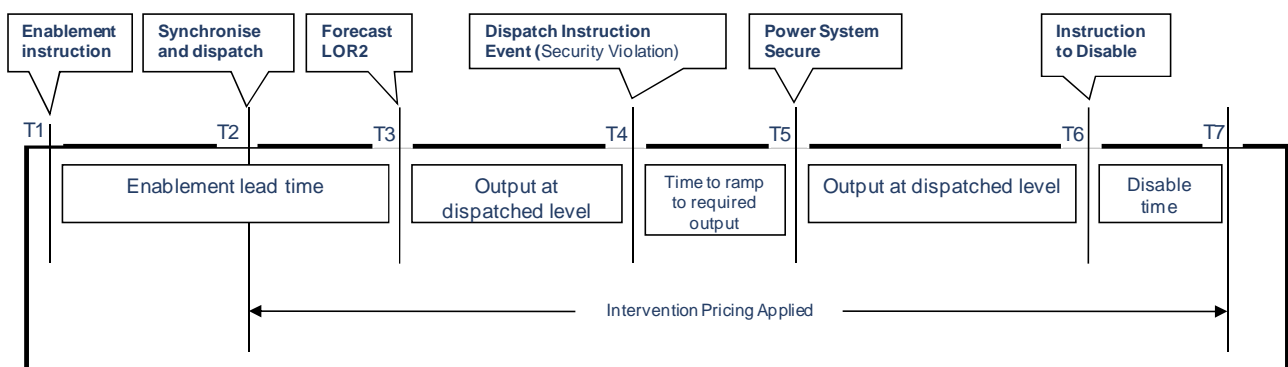


Figure 2: Timeline for slow response reserve (Forecast LOR2 from T3 to T6)

Enablement means preparing the *reserve equipment* to be *dispatched*. For example, Figure 1 demonstrates a fast response generator that does not need to be synchronised at the forecast LOR2 time (T2) to provide the reserve capacity. Note: a slow response generator may require *synchronising* and *loading* to its *minimum operating level* or some nominated level at the start of the LOR2 period (as shown in Figure 2), so that it can provide the reserve capacity within the timeframe required.

Enablement Lead Time means the maximum period required from the time the *Reserve Provider* receives an *enablement instruction* until the *reserve equipment* is:

- (a) synchronised and its loading level becomes equal to the minimum operating level for slow start plant;
- (b) ready for synchronisation for fast start plant; or
- (c) ready to be dispatched above its market capacity,

Dispatch Instruction means an *instruction* from *AEMO* to the *Reserve Provider* to *dispatch reserve* or to *disable the reserve equipment* (as the case may be).

Disablement means the cessation of the provision of *reserve* required by a *dispatch instruction* and resuming the taking of electricity supply.

Disablement Lead Time means the period required to *disable the reserve equipment*

17 Activation of Unscheduled Reserve

Unscheduled plant is not registered in the *AEMO* MMS with a unique *DUID*. Activation of *unscheduled reserve* appears in the *market* as a decrease in scheduled demand. In the MMS, *AEMO* has implemented generic *RERT DUIDs* for the purpose of activating unscheduled reserve.

Activation in the MMS is a two-part process involving:

1. Constraint equations which act on the generic *RERT DUIDs*
2. Submitting a reserve schedule using the Load Forecasting package

The reserve schedule ensures the PASA reserve calculation is accurate by modifying the load forecast to take into account the reduction in scheduled demand due to the activation of *unscheduled reserve*.

17.1 Key Terminology

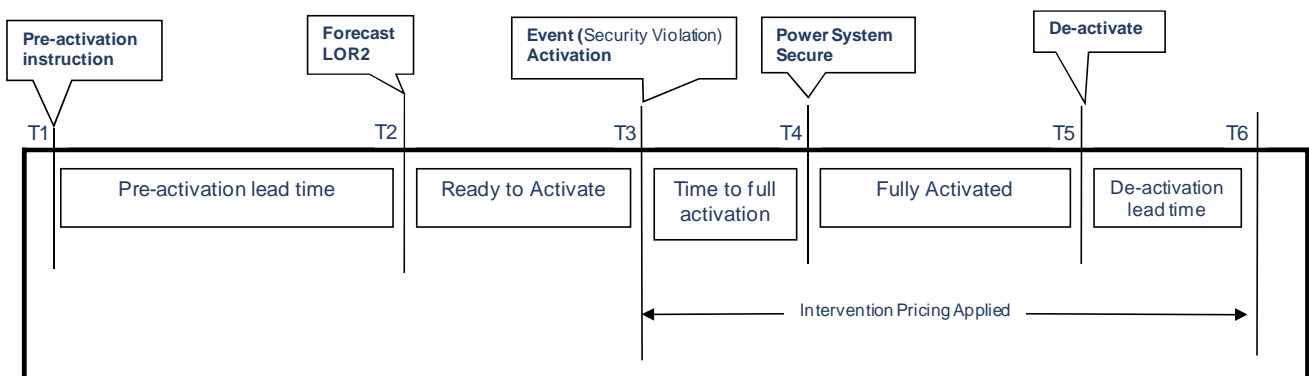


Figure 3: Timeline for fast response unscheduled reserve (Forecast LOR2 from T2 to T5)

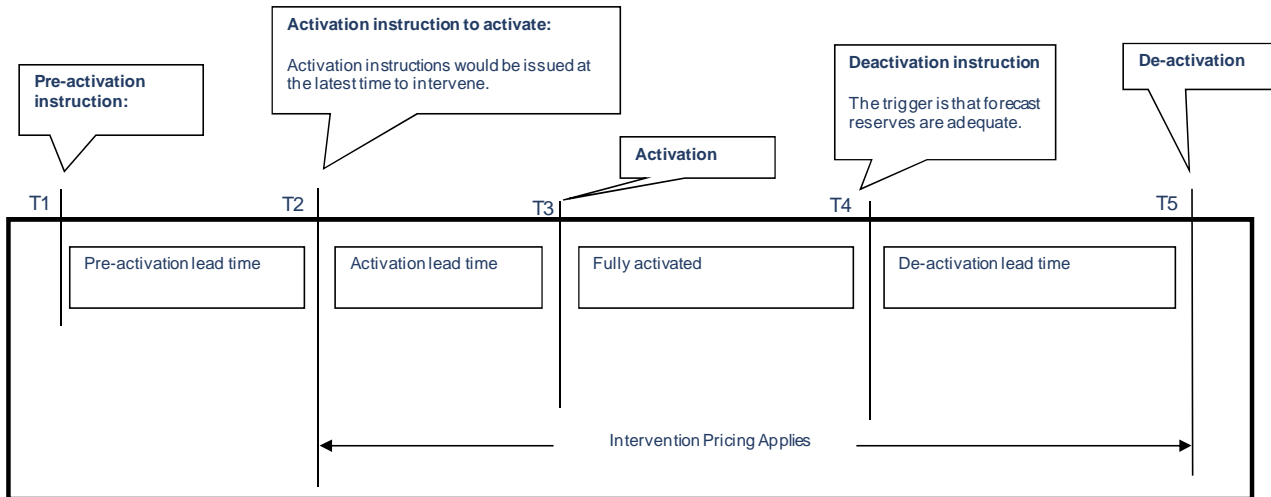


Figure 4: Timeline for slow response unscheduled reserve (Forecast LOR2 from T3 to T4)

Pre-activation means preparing the *reserve equipment* for *activation*.

Pre-activation lead time means the maximum period required to prepare the *reserve equipment* for *activation*

Activation means *synchronising the reserve equipment* where required and increasing its output to the *firm capacity*.

Activation Lead Time means the maximum period required by the *Reserve Provider* to *activate reserve* in response to an *activation instruction*.

De-activation means reducing the output of the *reserve equipment* to the *network* as quickly as practicable until it is below its *market capacity* or is *de-synchronised*.

De-activation Lead Time means the maximum period required to *disable the reserve equipment*