

---

**Ancillary Service Report 2008**  
**prepared under clause 3.11.11 of**  
**the Market Rules by System**  
**Management**

---



## Table of Contents

1	INTRODUCTION	1
1.1	System Management	1
1.2	Ancillary Service Report	1
2	QUANTITIES OF ANCILLARY SERVICES IN THE PRECEEDING YEAR (2007/08)	2
3	COST OF ANCILLARY SERVICES IN THE PRECEEDING YEAR (2007/08)	3
4	ANCILLARY SERVICE REQUIREMENTS AND PLAN FOR COMING YEAR (2008/09)	3
4.1	Ancillary Service Requirements for Coming Year 2008/09	3
4.1.1	Load Following	4
4.1.2	Spinning Reserve	4
4.1.3	Load Rejection Reserve	5
4.1.4	Dispatch Support	5
4.1.5	System Restart	6
4.2	Ancillary Service Plan for Coming Year 2008/09	6
4.2.1	Development	6
4.2.2	Load Following	6
4.2.3	Spinning Reserve	6
4.2.4	Load Rejection	7
4.2.5	Dispatch Support	7
4.2.6	System Restart	7
5	ANCILLARY SERVICE BUDGET FOR COMING YEAR (2008/09)	7

# 1 Introduction

## 1.1 System Management

Western Power is established under section 4(1)(b) of the *Electricity Corporations Act 2005* and has the functions conferred under section 41 of that act.

Part 9 of the *Electricity Industry Act 2004* makes provision for a wholesale electricity market and provides for the establishment of Market Rules.

One of the core functions undertaken by Western Power is the management of the electricity transmission and distribution networks. Regulation 13 of the *Electricity Industry (Wholesale Electricity Market) Regulations 2004* provides that the Market Rules may confer on an entity the function of operating the SWIS in a secure and reliable manner.

Clause 2.2 of the *Wholesale Electricity Market Amending Rules (September 2006)* (**Market Rules**) confers this responsibility upon the segregated (“ringfenced”) business unit of Western Power known as System Management. Amongst these responsibilities, the functions of System Management are to:

- operate the SWIS in a secure and reliable manner; and
- provide regular reports to the IMO and other market participants.

Included in the requirement to report is the Ancillary Service Report which is described in clause 3.11.11 of the Market Rules.

## 1.2 Ancillary Service Report

System Management has prepared this report pursuant to its obligations under clause 3.11.11 of the Market Rules, for the two year period 1 July 2007 to 30 June 2009. The Ancillary Service Report comprises of four parts:

- (a) the quantities of each of the Ancillary Services provided in the preceding year, including Ancillary Services provided under Ancillary Service Contracts, and the adequacy of these quantities;
- (b) the total cost of each of the categories of Ancillary Services provided, including Ancillary Services provided under Ancillary Service Contracts, in the preceding year;
- (c) the Ancillary Service Requirements for the coming year and the Ancillary Services plan to meet those requirements; and
- (d) the budget approved in accordance with clause 2.23 for providing Ancillary Services for the coming year.

The following sections will address each of these requirements.

## **2 Quantities of Ancillary Services in the Preceding Year (2007/08)**

The average combination of Load Following and Spinning Reserve supplied was 250 MW for the period 1 May 2007 to 1 May 2008. It should be noted that the cost set out in Table 1 in Section 3 is for April 2007 to March 2008 inclusive. The same average was supplied in both on and off peak periods.

The amount of spinning reserve supplied generally exceeded the requirement that requires the sum of the load following and spinning reserve to be at greater than 70% of the maximum output of any generator. The more spinning reserve than the minimum requirement will often be provided especially at night when units are left running on minimum output. The average is weighted above minimum requirements because generators are committed/decommitted to the system in increments of capacity to ensure spinning reserve does not fall below the minimum requirement.

Load rejection reserve service is calculated for dispatch purposes, with quantities of this service being dynamic and not currently recorded for historic analysis. The requirement for this year was 120MW and no overfrequency events above 51Hz were recorded.

Dispatch Support Services were procured in 2007/08. The service required for Power System Security in the North Country region was delivered by the Verve Energy generators at Mungarra. Further, a dispatch support arrangement was entered into in respect of services from Verve Energy's West Kalgoorlie and Geraldton facilities.

No System Restart Services were used in 2007/08. Three Verve Energy Black Start generators were reserved for this purpose.

Generally the ancillary services supplied met the ancillary service requirements for this year.

### 3 Cost of Ancillary Services in the Preceding Year (2007/08)

Table 1 provides the cost of each ancillary service for the period 1 April 2007 to 31 March 2008. It should be noted that the cost of load following and spinning reserve is dependent on the Marginal Cost Administered Price (MCAP) during the trading intervals. The MCAP is determined two business days after the relevant trading day.

Table 1 – Cost of Ancillary Services

Ancillary Service	Total Payment (excluding GST)
Load Following	\$ 1,489,716.23
Spinning Reserve	\$ 14,277,840.67
Load Rejection	\$ 0
Dispatch Support	\$ 0
System Restart	\$ 247,497.00
TOTAL	\$ 16,015,053.90

Note that as at the end of the trading day for 31 March 2008 no Dispatch Support had been supplied.

### 4 Ancillary Service Requirements and Plan for Coming Year (2008/09)

#### 4.1 Ancillary Service Requirements for Coming Year 2008/09

The ancillary service requirements are determined by the Ancillary Service Standards defined in Market Rule 3.10. The requirements for each of the ancillary services have been developed to meet the standards for the upcoming year, having regard to the requirements of the Power System operation Procedure: Ancillary Services.

Except as otherwise noted in this section, the ancillary service requirements are not:

- location specific;
- variable for different SWIS load levels or other scenarios;
- variable by the type of day and time of day; or
- variable across the year.

#### **4.1.1 Load Following**

The standard is specified in Market Rule 3.10.1(a):-

*“a level which is sufficient to:*

*provide Minimum Frequency Keeping Capacity, where the Minimum Frequency Keeping Capacity is the greater of:*

*i. 30 MW; and*

*ii. the capacity sufficient to cover 99.9% of the short term fluctuations in load and output of Non-Scheduled Generators and uninstructed output fluctuations from Scheduled Generators, measured as the variance of 1 minute average readings around a thirty minute rolling average.”*

System Management cannot accurately forecast the fluctuations due to load and wind variations in the short or long term. System Management carried out a detailed analysis of historic short term fluctuations of the system performance from 1 May 2007 to 1 May 2008. This analysis demonstrated that the capacity to cover 99.9% of these fluctuations of scheduled generators, measured as a variance of 1 minute average readings around a 30 minute rolling average is +62/-62MW. The fluctuations caused by the loads alone was -28/+24MW and for the intermittent generators alone was -58/+59MW. These values are up from the previous ancillary plan which had fluctuations from load alone being -29/+22 and for the intermittent generators alone being -45/50MW.

The load following requirement for the 2008/09 year has been based on this historical analysis and is set at +60/-60MW. The minimum Frequency Keeping Capacity is set to the positive value of the requirement derived from historical analysis, being 60MW, representing an increase to the 2007 value of 50MW. These fluctuations are to expected to vary from year to year due to their random nature. It should also be noted that this years analysis was over 12 months compared to the previous analysis which was for 4 months.

It should be noted that this increases the proportion of load following component in the spinning reserve which is discussed below and this service can not be supplied from facilities such as interruptible loads that do not respond to continuous control signals.

#### **4.1.2 Spinning Reserve**

The standard is specified in Market Rule 3.10.2 -

*“is a level which satisfies the following*

*principles:*

*(a) the level must be sufficient to cover the greater of:*

- i. 70% of the total output, including parasitic load, of the generation unit synchronised to the SWIS with the highest total output at that time;and*

ii. *the maximum load ramp expected over a period of 15 minutes;*

*(b) the level must include capacity utilised to meet the Load Following Service standard under clause 3.10.1, so that the capacity provided to meet the Load Following requirement is counted as providing part of the Spinning Reserve requirement;”*

The requirement is determined by the largest output of any unit on the system. This will vary with the dispatch plans of the various participants. System Management cannot accurately forecast the dispatch of each unit on the system in the short or long term.

For 2008/09 Collie Power Station is the largest unit on the SWIS with a maximum generated output of 340MW. Hence, the maximum spinning reserve level that may be required is 0.7 multiplied by 340MW which is 240MW.

It is noted that the spinning reserve ancillary service requirement is the spinning reserve level less any load following requirement. Hence the minimum spinning reserve service required is  $240 - 60 = 180\text{MW}$ . This can be provided by such facilities as synchronised generation and interruptible loads.

#### **4.1.3 Load Rejection Reserve**

The standard is

*“The standard for Load Rejection Reserve Service is a level which satisfies the following principles:*

*(a) the level sufficient to keep over-frequency below 51 Hz for all credible load rejection events;”*

The requirement is determined by the amount of load that is lost during the majority of network faults. This requirement is set at 120MW, this is unchanged from last year. It should be noted that at times when the risk of load rejection is low due to the prevailing weather conditions this may be reduced. This results from the risk of a network fault causing a load rejection is significantly reduced at times of low lightning activity.

It is expected that later in the 2008/09 year the reduction during fair weather conditions will be limited to 110MW which will cover disconnection of load at Boddington after a network fault.

#### **4.1.4 Dispatch Support**

Dispatch support services are forecast to be required for 2008/09. This will continue to be supplied for network support from Verve Energy facilities at Mungarra, West Kalgoorlie and Geraldton.

System Management does not at this time anticipate entering into further arrangements for dispatch support during 2008/09.

#### **4.1.5 System Restart**

The requirement for system restart is developed by System Management.

System Management has determined that there should be at least three generating stations that can start upon black system conditions and can energise the rest of the system. It should be noted that certain generators with self-start facilities, such as those at Kalgoorlie, cannot restart the rest of the system due to network constraints.

There is a requirement that the black start generators should not be at the same location to mitigate the risk of common failure at the same power station and capable of energising discrete sub-networks.

## **4.2 Ancillary Service Plan for Coming Year 2008/09**

### **4.2.1 Development**

System Management may procure ancillary service from participants other than Verve Energy in circumstances where it believes Verve Energy cannot provide sufficient services or another party can provide a less expensive alternative.

System Management anticipates testing the market for the provision of ancillary services during 2008/09. To this end, a plan setting out considerations, issues and timelines attaching to ancillary service procurement will be prepared by System Management for publication in the first quarter of 2008/09.

### **4.2.2 Load Following**

The load following requirements will be met with the additional commitment of Verve Energy generation.

There is sufficient Verve Energy plant to meet this requirement even with the largest load following provider unit (a frame 9 gas turbine) out of service.

The requirement given in section 4.1.1 above (i.e. 60MW) can be met by operating fast acting generators, such as open cycle gas turbines, whose total operating range (in MW) is equal to that required. The requirement can also be met by operating slower acting generators, such as steam turbines, however their total operating range (in MW) may need to be greater than required. For example a 60MW load following service may be provided by slow acting generators whose total operating range is 120MW.

System Management may seek competitive procurement of this service, a process which will potentially commence in 2008/09.

### **4.2.3 Spinning Reserve**

For 2008/09 52MW of spinning reserve will be provided by interruptible load supplied by two non-Verve Energy market participants. This will reduce in October 2008 to 42MW.



The remaining spinning reserve will be supplied by synchronising additional Verve Energy generators. There is expected to be sufficient Verve Energy plant to meet this requirement even with the largest spinning reserve provider unit (a large open cycle gas turbine) out of service.

System Management may seek competitive procurement of this service, a process which will potentially commence in 2008/09.

#### **4.2.4 Load Rejection**

The Load Rejection requirement will be provided by the ability to turn down or off a Verve Energy generating unit(s). There is expected to be enough turn down even at times of minimum Verve Energy generation. This however will get harder to manage as overnight load supplied by Verve Energy is reduced.

With greater penetration of non Verve Energy generation with overnight running commitments, System Management considers that it will be necessary to undertake detailed analysis of the need for load rejection prior to the commencement of the next allowable revenue review period on 1 July 2010.

#### **4.2.5 Dispatch Support**

Dispatch support services are forecast to be required for 2008/09. At this stage System Management anticipates continuing to obtain these services from Verve Energy facilities at Mungarra, West Kalgoorlie and Geraldton.

#### **4.2.6 System Restart**

The service will be provided by three Verve Energy gas turbines located at Kwinana, Pinjar and Tiwest. System Management foresees the need to engage in an "expression of interest" process throughout 2008/09. This process will seek to identify the capacity of the market to supply additional restart services and may culminate in further procurement.

## **5 Ancillary Service Budget for Coming Year (2008/09)**

The Ancillary Service Budget for 2008/09 is determined by the Economic Regulation Authority (ERA). The ERA determined that the Ancillary Services Allowable revenue is nil for 2008/09. Ancillary Services are funded by Market Participants through the IMO.

However, the ERA approved an allocation of \$250,000 for the purposes of the provision of System Restart Ancillary Services.

In addition, Dispatch Support is provided pursuant to contractual provisions and depend on the frequency of dispatch of particular facilities and the value of the Marginal Cost Administered Price. Consequently it is not possible to accurately forecast the likely cost to the market of these services in 2008/09.