



Independent Market Operator
System Management PSOP Working Group

Agenda

Meeting No.	4/2008
Location:	IMO Board Room Level 3, Governor Stirling Tower, 197 St Georges Terrace, Perth
Date:	Thursday, 11 December 2008
Time:	2:00pm till 4:00pm

Item	Subject	Responsible	Time
1.	WELCOME AND APOLOGIES / ATTENDANCE	Chair	5 minutes
2.	MINUTES OF PREVIOUS MEETING / ACTIONS ARISING	System Management	5 minutes
3.	PSOP: Operational Data Points for Generating Plant	System Management	40 minutes
4.	PSOP: Operational Data Points for Non-Western Power Networks and Substations	System Management	10 minutes
5.	PSOP: MT PASA	System Management	40 minutes
6.	PSOP: ST PASA	System Management	10 minutes
7.	OTHER BUSINESS Discussion on any other matters that fall within the scope of the Working Group's Terms of Reference.	Chair	5 minutes
8.	NEXT MEETING The next PSOP Working Group meeting to be scheduled.	Chair	5 minutes

ELECTRICITY INDUSTRY ACT
ELECTRICITY INDUSTRY (WHOLESALE
ELECTRICITY MARKET) REGULATIONS
2004

WHOLESALE ELECTRICITY MARKET
RULES

Power System Operating Procedure:
Operational Data Points For Generating Plant

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1. OPERATIONAL DATA POINTS FOR GENERATING PLANT

Operational Data Points for Generating Plant specifies System Management's requirements for operational data points to be transmitted through the SCADA Operational Interface between generating plant connected to the South West interconnected system (**SWIS**) and the Western Power Networks (**WPN**) Control Centre at the East Perth (**EPCC**). It does not specify the requirements for the operational data points to be transmitted through the SCADA Operational Interface between WPN owned and operated Transmission and Distribution elements of the SWIS network and the EPCC. Nor does it specify the performance requirements for the SCADA Operational Interfaces.

2. SCOPE

The Operational Data Points for Generating Plant procedure discusses the factors that influence the requirements and how they are to be applied to the specific types of generators connected to the system. The requirements are summarised in the tables in the appendices to this document. The operational data points specified in the appendices are the minimum requirement and Participants may, in agreement with System Management, agree modified requirements.

3. ASSOCIATED PROCEDURES AND OPERATIONS STANDARDS

The following Power System Operation Procedures are associated with this Operational Data Points for Generating Plant procedure:

- a. Power System Operation Procedure - Communications and Control Systems.
- b. Power System Operation Procedure - The Performance of Power System Operational Data Communications Facilities

4. TYPES OF GENERATION FACILITIES

The requirements detailed in this document shall apply to all types of generating plant that are likely to be connected to the SWIS including :

- Intermittent Generating Systems with a large number of small units
- Conventional Steam Turbine Generators
- Open Cycle Gas Turbine Generators
- Combined Cycle Gas Turbine Generators with associated Steam turbine Generators
- Generators that are part of a co-generation facility
- Biomass Generators
- Landfill Gas Generators

5. AGGREGATION OF FACILITIES

1. In the case of Non-intermittent Generators classified as an aggregated facility the requirements detailed in the document shall apply to individual generators within the facility.
2. In the case of Intermittent Generators classified as single Non-Scheduled Generators the requirements detailed in this document shall apply to the aggregated facility.

6. BOUNDARIES OF RESPONSIBILITY

1. The level of operational data to be interfaced with the SCADA will depend upon how the generating plant involved is to be operated. In most cases it is expected that the generating plant will be operated from a 24 per hour 7 day per week attended generator control facility. However in some cases the owner/operator of the generating plant may include in the an agreement provision for the generating plant to be remotely operated, outside normal business hours, by System Management.
2. To enable System Management to monitor the operating state of generators connected to the SWIS, the Generator shall provide real time operational data points from the generators to interface through the SCADA Operational Interface with WPN SCADA Remote Terminal Units (**RTU**) in the adjacent WPN Substation. The operational data points shall be transmitted between the WPN Substation SCADA RTU and the WPN SCADA Master Station at the EPCC. At the EPCC the operational data points shall be interfaced with the SM SCADA operational displays that will provide operational information similar to that provided on the generating plant operational displays.
3. For generating units where the owner/operator has agreed that System Management will remotely operate the plant, the operational data points shall provide the same level of control and monitoring that is provided to a local operator. Where appropriate alarms from generating units operated remotely by System Management, which require System Management to take the same action, shall be grouped.
4. Where System Management has the provision to transmit desired set point levels to the generating plant the operational data points shall include separate feedback data points to enable the actual operating set point level to be monitored independently of the desired level.

7. GENERATION DISPATCH

1. A Market Generator subject to the dispatch process shall provide a mechanism for the sending, receiving, and acknowledgement of Dispatch Instructions, Dispatch Advisories, changes to the Rated Capacity, and Outage Plans, relating to the generating system concerned.
2. The generating facility shall also be interfaced with the System Management Market Information Technology System (**SMMITS**), or as otherwise directed.
3. For intermittent generating systems, where System Management issues a dispatch instruction (either verbally or through an automatic control system)

that requires the generating system to operate below its actual capability at that time, System Management may be required to provide the IMO with an estimate of the actual capacity that would have been available if the output of the generating system had not been limited. This data is used by the IMO to calculate the compensation to be paid to the Intermittent Generator. Intermittent Generators shall provide sufficient operational data points to enable System Management to calculate and provide the IMO with an estimate of the actual capacity available from the generating system for the prevailing conditions. The Intermittent Generator shall include operational data points for the number of generator units available and for the critical quantities required to enable the required capacity calculations to be made (eg wind speed at the nacelle height, wind direction, and air density). In the case of Intermittent Generators where it has been identified that different parts of the facility have different wind performance characteristic, the units in that part of the facility shall be grouped and these data points shall be provided separately for each group.

4. Also in the case of intermittent generating systems, where the loss of integral reactive support devices causes a reduction in the permitted operating capacity of the generating system the Intermittent Generator shall include operational data points to indicate the number of reactive support devices available.
5. For intermittent generators the operational data points that are to be provided shall be at the discretion of System Management.

8. SYSTEM SECURITY

8.1 Network Analysis Facilities

1. In order to facilitate the monitoring and control of the security of the SWIS it is necessary for System Management to analyse the operating state of the SWIS using a number of Network Analysis facilities that are integrated with the SCADA Systems at the EPCC.
2. To account for the loss of incoming operational data points System Management must be able to estimate the operating state of the SWIS using the State Estimation facility.
3. To anticipate possible operating scenarios, where the Power System Security limits may be breached, System Management must be able to perform calculations, using Contingency Selection and Analysis facility, to determine voltage and ampere levels in the power system for a range of contingency situations. System Management will, when necessary, use the results of these calculations to take appropriate pre-emptive action in order to prevent the occurrence of a breach of power system security limits.
4. To ensure that the elements of the power system are not subject to fault operating conditions that may exceed the switchgear fault rating System Management must be able to perform Fault Level calculations as the power system configuration changes. System Management, when necessary, will use the results of these calculations to reconfigure the network to ensure that the network elements are operating within their rated capacity.

5. The Network Analysis facilities in the SCADA require System Management to be able to model operation of the power system using modelling data provided through the SMMITS interface and using real time power system operational data provided through the SCADA Operational Interface including real time operational data from generating systems. The Generator shall provide all the operational data points, as shown in the tables in the appendices, that are required to enable System Management to model the generating plant and its connections to the SWIS.
6. Where the generating system is embedded into a local network the Generator shall provide operational data points, as shown in the tables in the appendices, for all elements in the local network that can interconnect the generation plant with the SWIS and account shall be taken of any locally connected loads.
7. In the case of intermittent generating systems, where the individual generating units contribute to the fault current, operational data points for the number of units available shall be provided to enable the power system model to be correctly configured.

8.2 Emergency Disconnection of Unattended Generating Systems

1. The Technical Rules provides for Western Power to direct that a generation system must be taken out of service and/or disconnected if it is likely to adversely affect the secure operation of the SWIS. Where a generating system does not comply with such directions within a reasonable period of time Western Power may disconnect it from the SWIS without notification.
2. It should be noted that a generator will only be disconnected as a last resort when System Management have taken all reasonable measures to contact the owner/operator of the generating plant or when the owner/operator has not complied with a reasonable request to disconnect and the secure operation of the SWIS is still being adversely affected.
3. Where the generating unit is to be operated unattended or may be unattended at any time the Generator shall provide operational data points to allow System Management to remotely open the Generator main circuit breaker connecting the generating unit to the SWIS.
4. Where the generating unit is operated from a 24 hr 7 days per week attended control facility and where the connection arrangement does not include a Generator main circuit breaker, System Management will implement emergency disconnection by opening the circuit breaker(s) at the point of connection in the WPN substation on the circuits through which the generator(s) are connected to the SWIS

9. ANCILLARY SERVICES

Ancillary Service requirements in the WEM are governed by chapter 3 of the WEM together with the Ancillary Rules and Procedures issued by System Management.

Where a generating unit is or may intend to provide Ancillary services requiring connection to the Automatic Generation Control (**AGC**) relating to one or more types of Ancillary Services. The Generator shall provide the operational data points required to enable System Management to send and receive real time operational data to and from the AGC facility incorporated in the SCADA system at the EPCC. This shall include governor system raise/lower commands, AGC enable and disable commands, loading and unloading ramp rate commands, and target MW output, as well as “handshake” signals to ensure that the communications channels are intact.

10. NETWORK CONTROL SERVICES

1. Network Control Service requirements in the WEM are governed by chapter 5 of the WEM.
2. Where the generating unit is contributing to the provision of Network Control Services the Generator shall include operational data points to enable SM to monitor and, where agreed, control the operational status of any device that is critical to the provision of these services. This shall include start and stop commands, starting/rundown in progress, Synchronous Compensator/Generator mode selection commands, Reactive Plant switching commands, Tap Changer position commands, excitation system raise/lower commands, voltage levels, and MVAR output, SVC control mode (power factor or voltage) selection and related set point commands.
3. In the case of intermittent generating systems where static reactive compensator devices have been provided for network voltage support operational data points for the number of devices available and the MVAR input/output to the devices shall be provided.

11. NETWORK PROTECTION SCHEME

Where the agreed access conditions include the provision of special network protection schemes, the SCADA operational interface shall include operational data points for the control and monitoring of the generating system. This shall include signals to control the output of the generating systems and to provide both the power station operators and System Management with indications that these schemes have operated.

12. COMPLIANCE MONITORING

1. System Management is required to monitor compliance of generating systems with the Scheduled Resource Plans, Dispatch Instructions and Advisories, Ancillary Service provisions, and Network Control provisions. In order to monitor compliance System Management must be able to monitor the operating state of critical operational data points on all generating systems connected to the SWIS. This will normally be implemented by interfacing data points from the generating systems to a high-speed recording device.
2. Where it has been determined that System Management will monitor the performance of the generating systems the Generators shall provide the

operational data points that System Management considers critical to ensuring that the generating systems are meeting their obligations under the WEM Rules. These data points shall be separate to those transmitted to System Management and shall normally be interfaced directly with the high-speed recording device.

13. SCADA INTERFACE PERFORMANCE

1. The provision of reliable, accurate and timely operating data to and from the generating systems is critical for System Management to perform its role required by the WEM Rules. The Generator shall ensure that the SCADA Operational interface operates in accordance with the specified performance requirements.
2. The performance requirements for the SCADA Operational Interfaces are dealt with in a separate document.

14. SPECIFIED POINTS

The attached tables indicate the types of SCADA Operational Data points that are required. Alarm points may be provided as a single point where the points from individual devices are paralleled within the generation facility or may be provided as individual points from the individual devices and paralleled within the WPC RTU. Status points must be provided directly from the auxiliary contacts provided on the device concerned. To ensure adequate redundancy for the Security Dispatch Functions in the SCADA System all analogue points must be provided from a direct measurement of the quantities. Summated analogue values are not acceptable.

15. COMMUNICATIONS AND CONTROL

1. Clause 2.35.4 of the Wholesale Electricity Market Rules (**WEM Rules**) requires that System Management (**SM**) document the communication and control system requirements needed to support the dispatch process. System Management has done so in the Power System Operating Procedure: Communications and Control Systems.
2. This Power System Operating Procedure is additional, and complementary, to the Power System Operating Procedure: Communications and Control Systems. To the extent of any inconsistency, this Power System Operating Procedure applies.

Table 1 - System Management Operational Data Points Requirements for Scheduled Generators without AGC

Point Description	Transmission Connected and 10 MW or more	Transmission Connected and less than 10 MW	Distribution Connected
Status			
All IPP facility switching devices opened/closed (isolators, earth switches, circuit breakers, etc - 2 complementary contacts ie. NO/NC pair)	√	√	√
Remote generation load control on/off	R		
Generating unit operating mode (e.g.gen/synch comp if applicable)	R		
AVR or SVC control mode (eg constant q, constant V, manual or off)	R		
Turbine control limiting operation (e.g. temp etc)	R		
Governor mode (e.g. droop/isochronous)	√		
Generating facility synchronising	√	√	√
Generator run up and run down	R		
Fuel type (e.g. liquid/gas/coal)	√		
Base/Peak mode	G		
Associated reactive plant switching devices opened/closed (isolators, circuit breakers, etc 2 complementary contacts ie NC/NO pair)	√		
Alarms			
Main circuit breaker(s) tripped by protection			√
Protection defective alarms	R		
Over/Under Excitation Limiter Operated	R		
Protective Load Shed Operated	√		
Communications Link(s) Fail	√	√	√
High/Low Severity Alarms	R		
Generator protection operated	√	√	
Step up transformer protection operated	√	√	
Associated Reactive plant protection operated	√		
Measured Values			
Gross active and reactive power output of each generating unit	√		
Nett active and reactive power output of each generating unit	√		
Net facility active and reactive power import or export at each connection point	L	L	L
Local Load and/or Unit Auxiliary active power and reactive power	L	L	L
Generating unit stator voltage	√	√	√ see note 1
Generator step-up transformer tap position	√		
Net facility output of active energy (impulse)	M	M	M
Speed of rotor as percentage of synchronous speed	R		
Reactive power flow for each associated reactive power device	√		

Point Description	Transmission Connected and 10 MW or more	Transmission Connected and less than 10 MW	Distribution Connected
Control			
Pulse or set point control of exciter	R		
Generator step-up transformer tap position	R		
Generator Start /Stop (note: separate start commands are required if unit can be started to different output levels (i.e. min, 50%, max)	R		
Generator main circuit breaker	U		
Base/Peak mode selection	R		
Associated reactive plant operating mode (power factor/voltage)	R		
Power factor and voltage set points	R		
Each reactive power device circuit breakers	R		

Note 1 : voltage on Western Power side of Main Switch
Blank cell = not required
Points with grey background are sent from WPN SCADA to the Generator
√ = required
F = If providing AGC for frequency load following ancillary service support
G = required for Gas Turbines generators only
L = required if local load or a unit auxiliary transformer is connected anywhere between the generator terminals and the point of connection
M = not required if metered
R -=required if WP contracted to provide remote control
U = required if facility unattended or if WP contracted to provide remote control

Table 1A – System Management Additional Operational Data Points Requirements for Scheduled Generators with AGC

Point Description	Transmission Connected and 10 MW or more	Transmission Connected and less than 10 MW	Distribution Connected
Automatic Generation Control (AGC)			
AGC pulse or Desired Load MW Set Point (control of the governor)	F		
Base Load MW	F		
AGC Control and Participation Mode (Assist/Full/Regulation/None)	F		
AGC Communications Link Fail Alarm	F		
AGC Control Status (Local/SOCC)	F		
High Loading limit MW value	F		
Low Loading limit MW value	F		
Ramp up rate limit MW/min value	F		
Ramp down rate limit MW/min value	F		
Governor On/Off	F		
AGC Regulation Mode (Normal/Assist)	F		
AGC Control Mode (Base/Econ/Ramp)	F		

Blank cell = not required
Points with grey background are sent from WPN SCADA to the Generator
F = required if providing AGC for frequency load following ancillary service support

Table 2 – System Management Operational Data Points Requirements for Transmission Connected Non- Scheduled Generators

Point Description	Non-Intermittent and 10 MW or more	Non-Intermittent and less 10 MW	Intermittent and 10 MW or more	Intermittent and less than 10 MW
Status				
All IPP facility switching devices opened/closed (isolators, earth switches, circuit breakers, etc – 2 complementary contacts ie. NO/NC pair)	√	√	√ See note 1	√ See note 1
Associated reactive plant Control Mode (eg power factor, voltage)	√		√	
Generating facility synchronising	√	√	√	√
Associated reactive plant switching devices opened/closed (isolators, circuit breakers, etc 2 complementary contacts ie NC/NO pair)	√		√	
Alarms				
Main switch tripped by protection		√		√ see note 1
Generator protection operated	√		√	
Step up transformer protection operated	√		√	
Associated Reactive plant protection operated	√		√	
Communications Link(s) Fail	√	√	√	√
Measured Values				
Gross active and reactive power output of each generating unit	√		See note 1	
Nett active and reactive power output of each generating unit	√		See note 1	
Net facility active and reactive power import or export at each connection point	√	√		√ see note 1
Local Load and/or Unit Auxiliary active and reactive power	L		L	
Generating unit stator voltage	√		√ see note 1	
Generator step-up transformer tap position	√		√	
Net facility output of active energy (impulse)	M	M	M	M
Wind data (speed, direction, air density, and the relationship of wind to generator output)			W	
Number of individual generator units available for service	√		√	
Number and rating of reactive power devices available for services	√		√	
Reactive Power flow in each reactive power device				

Point Description	Non-Intermittent and 10 MW or more	Non-Intermittent and less 10 MW	Intermittent and 10 MW or more	Intermittent and less than 10 MW
Control				
Generator Set point from special network protection schemes	S		S	
Set point control of reactive power devices (power factor and voltage)	R		R	
Generator step-up transformer tap position	R		R	
Generator Emergency Stop	√	√	√	√
Generator Main Circuit Breaker	U	U	U	U

Note 1: For intermittent generators with a large number of small generating units the SCADA interface does not need to monitor individual units but must provide data points for the aggregate of all the units

Points with grey background are sent from WPN SCADA to the Generator

Blank cell = not required

√ = required

M = not required if metered

S = required where special network protection schemes are installed

U = required if facility unattended

W = required for wind farms

Table 3 - System Management Operational Data Points Requirements for Distribution Connected Non- Scheduled Generators

Point Description	Intermittent and 1MW or more and less than 10MW (see note 1)	Non-Intermittent and 1 MW or more and less than 10MW (see note 1)
Status		
All IPP facility switching devices opened/closed (isolators, earth switches, circuit breakers, etc - 2 complementary contacts ie. NO/NC pair)	√	√
Generating facility synchronising	√ see note 2	√
Alarms		
Generating unit circuit breaker(s) tripped by protection;	√	√
Main switch tripped by protection;	√	√
Generator electrical or mechanical protection operated	√	√
Communications Link(s) Fail	√	√
Measured Values		
Gross active power output of each generating unit;	√ see note 2	√
Gross reactive power output of each generating unit;	√ see note 2	√
Net facility active power import or export at each connection point;	√ see note 2	√
Net facility reactive power import or export at each connection point;	√ see note 2	√
Voltage on Western Power Side of Main Switch voltage;	√	√
Net facility output of active energy (impulse); (not required if metered)	√ see note 2	√
Wind speed data including relationship of wind to generator output	W	
Number of individual generator units available for service	√	√
Number and rating of reactive power devices available for services	√	√
Control		
Generator circuit breaker (s) or Main Switch Intertrip	√	√
Generator circuit breakers(s) or Main Switch Close Enable Interlock	√	√

Note 1: The requirements listed may be applied to generators with a rating less than 1 MW where concerns for safety and reliability arise.

Note 2: For intermittent generators with a large number of small generating units the SCADA interface does not need to monitor individual units but must provide data points for the aggregate of all the units

Points with grey background are sent from WPN SCADA to the Generator

Blank cell = not required

√ = required

W = required for wind farms

**ELECTRICITY INDUSTRY ACT
ELECTRICITY INDUSTRY (WHOLESALE
ELECTRICITY MARKET) REGULATIONS
2004
WHOLESALE ELECTRICITY MARKET
RULES**

Power System Operation Procedure

**Operational Data Points For Non-Western
Power Networks, Substations, And Loads**

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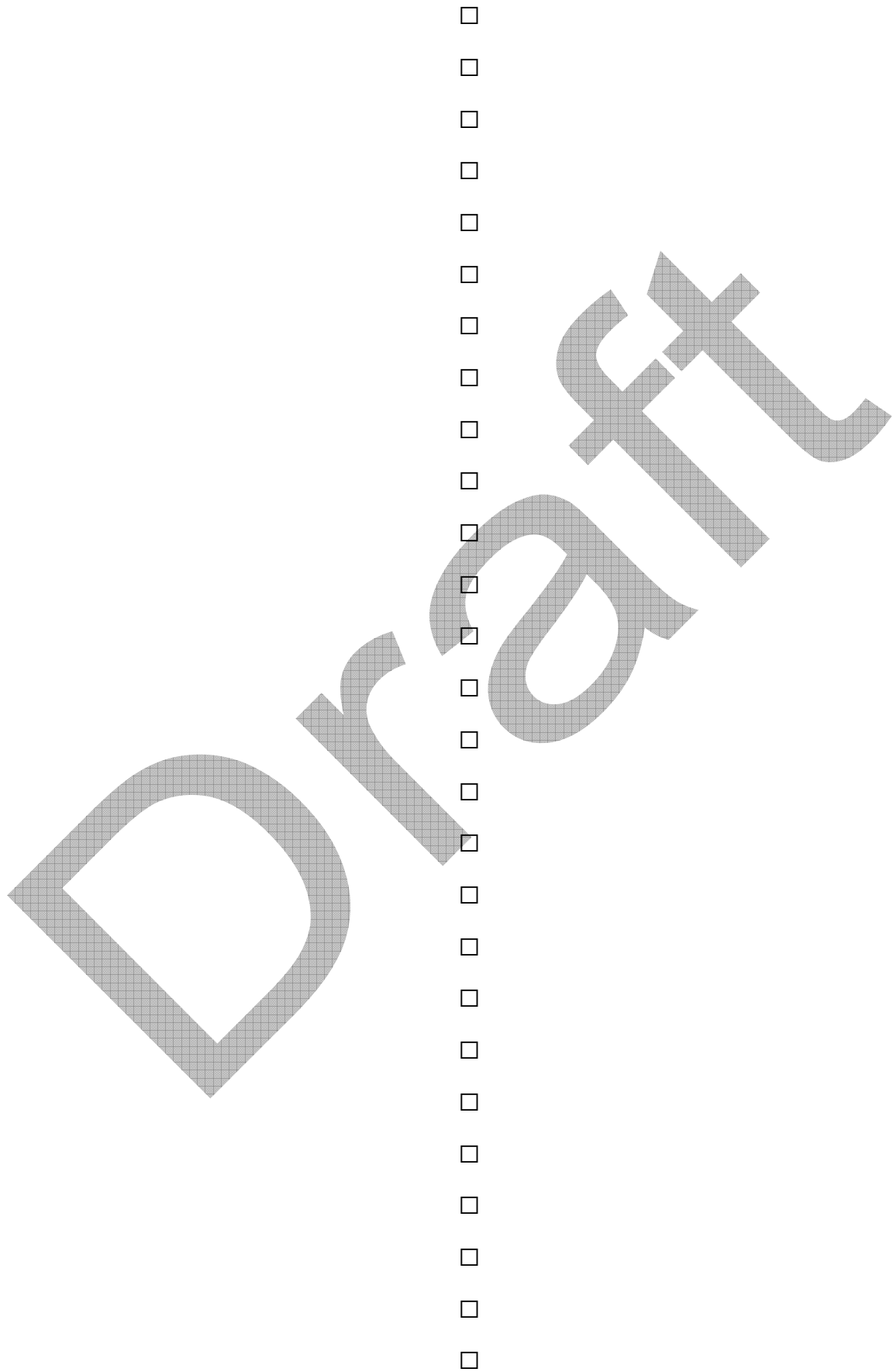


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1. OPERATIONAL DATA POINTS FOR NON-WESTERN POWER NETWORKS, SUBSTATIONS, AND LOADS

Operational Data Points for Non-Western Power Networks, Substations, and Loads specifies System Management's requirements for the operational data points to be transmitted through the SCADA Operational Interface between the Western Power Networks (WPN) Control Centre at the East Perth (EPCC) and non-WPN network, substation, and load plant. It does not specify the requirements for the operational data points to be transmitted through the SCADA Operational Interface between WPN owned and operated Transmission and Distribution elements of the SWIS network and the EPCC. Nor does it specify the performance requirements for the SCADA Operational Interfaces.

2. SCOPE

The Operational Data Points for Non-Western Power Networks, Substations, and Loads procedure discusses the factors that influence these requirements and how they are to be applied to the specific types of networks, substations, and loads connected to the SWIS. The requirements are summarised in the tables in the appendices to this document. The operational data points specified in the appendices are the minimum requirement and Participants may, in agreement with System Management, agree modified agreements.

3. ASSOCIATED PROCEDURES AND OPERATIONS STANDARDS

The following Power System Operation Procedures are associated with this Operational Data Points for Non-Western Power Networks, Substations, and Loads procedure:

- a. Power System Operation Procedure - Communications and Control Systems.
- b. Power System Operation Procedure - The Performance of Power System Operational Data Communications Facilities

4. TYPES OF NETWORK, SUBSTATION AND LOAD FACILITIES

1. The requirements in this document shall apply to all types of non-WPN network, substation and load plant that is capable of being connected to the SWIS at transmission network and substation level including:
 - Substations where part of the substation is owned by WPN
 - Substations where the whole substation and the network connecting it to the WPN network is not owned or operated by WPN.
 - Loads connected directly to a transmission network or substation owned by WPN.
 - Non- Dispatchable Loads connected to a non-WPN substation
 - Interruptable, Curtailable, and Dispatchable Loads as defined in the WEM Rules
2. They also apply to Interruptable, Curtailable, and Dispatchable Loads connected at distribution network level but **DO NOT** apply to:
 - Non-dispatchable loads connected at distribution network level.
 - Loads connected at distribution network level that are part of a scheme designed to reduce system load at peak demand times (sometimes called Peak Demand Saving schemes)
3. In general it is expected that the loads will be connected to the lower voltage side of a step down transformer that may or may not be owned by WPN. There may also be

reactive compensation devices (capacitors, reactors, SVC etc) connected with the load that are critical to ensuring that the load power factor is with the specified limits.

5. AGGREGATION OF FACILITIES

1. In the case of substations where only Non-dispatchable loads are connected the load may be aggregated at the step down transformer circuits.
2. Where Interruptable, Curtailable, and Dispatchable Loads are connected the requirements apply to the individual load types.

6. BOUNDARIES OF RESPONSIBILITY

1. The level of operational data to be interfaced with the SCADA will depend upon how the network, substation, or load plant involved is to be operated and the location of the operational boundary between WPN owned plant and the non-WPN owned plant at the substation. The following configurations are typical:
 - Where the transformer circuits and load plant are non-WPN owned it is expected that the operational boundary will be on the HV busbar side of the HV circuit isolator(s) of the transformer circuits that supply the non-WPN loads ie Western Power will own and operate the HV busbar and the incoming HV lines. This arrangement will typically apply where the substation is connected through transmission lines that are wholly owned and operated by WPN.
 - Where the substation only is wholly non-WPN owned the operational boundary is expected to be located at the point where the WPN transmission lines cross the boundary fence of the wholly non-WPN owned substation. This arrangement will apply where the non-WPN substation is connected through transmission lines that do not supply any other substations.
 - Where the substation and the transmission lines connecting it to the SWIS are wholly non-WPN owned the operational boundary is expected to be located on the substation side of the transmission line circuit isolator at the WPN owned operated substation to which the transmission lines are connected.

Note that other arrangements may be agreed between WPN and the Network Operator/Market Customer

2. To enable System Management to monitor the operating state of non-WPN networks, substations and loads connected to the SWIS, the Network Operator/Market Customer shall provide real time operational data points from their networks, substations, and loads to interface through the SCADA Operational Interface with the WPN SCADA Remote Terminal Units (RTU) in the substation. The operational data points shall be transmitted between the WPN Substation SCADA RTU and the WPN SCADA Master Station at the EPCC. At the EPCC the operational data points shall be interfaced with the System Management SCADA operational displays that will provide operational information similar to that provided on the non-WPN network, substation and load plant operational displays.
3. For non-WPN network, substation and load plant where the owner has agreed that System Management will remotely operate the plant, the operational data points shall provide the same level of control and monitoring that is provided to a local operator. Where appropriate alarms for plant remotely operated by System Management, and requiring System Management to take the same action, shall be grouped.
4. Where System Management has the provision to transmit desired set point levels to the non-WPN network, substation and load plant the operational data points shall include

separate feedback data points to enable the actual operating set point level to be monitored independently of the desired level.

7. INTERRUPTIBLE, CURTAILABLE, AND DISPATCHABLE LOADS

A Network Operator/Market Customer with loads that are subject to the dispatch process shall provide a mechanism for the sending, receiving, and acknowledgement of

- Interruptible, Curtailment and Dispatch Instructions,
- Interruptible, Curtailment, and Dispatch Advisories,
- changes to the Capacity, and
- Outage Plans

relating to the Interruptible, Curtailable, and Dispatchable Loads concerned.

8. SYSTEM SECURITY

8.1 Network Analysis Facilities

1. In order to facilitate the monitoring and control of the security of the SWIS it is necessary for System Management to analyse the operating state of the SWIS using a number of Network Analysis facilities that are integrated with the SCADA System.
2. To account for the loss of incoming operational data System Management must estimate the operating state of the SWIS using the State Estimation facility.
3. To anticipate possible operating scenarios, where the power system security limits may be breached, System Management must be able perform calculations, using the Contingency Selection and Analysis facility, to determine voltage and ampere levels in the power system for a range of contingency situations. System Management will, when necessary, use the results of these calculations to take appropriate pre-emptive action in order to prevent the occurrence of a breach of power system security.
4. To ensure that the elements of the power system are not subject to fault operating conditions that may exceed the switchgear fault rating System Management must be able perform Fault Level calculations as the power system configuration changes. System Management, where necessary, will use the results of these calculations to reconfigure the network to ensure that the network elements are operating within their rated capacity.
5. The Network Analysis facilities in the SCADA require System Management to be able to model operation of the power system using modelling data provided through the SMMITS interface and using real time power system configuration data provided through the SCADA Operational Interface including real time operational data from non-WPN networks, substations, and loads.
6. The Network Operator/Market Customer shall provide all the operational data points to enable System Management model the non-WPN networks, substation, and loads connected to the SWIS.

8.2 Emergency Disconnection of Unattended non-WPN plant

1. The Technical Rules provide for Western Power to direct that a non-WPN network and/or substation and/or its load must be taken out of service and/or disconnected if it is likely to adversely affect the secure operation of SWIS. Where the operator of a non-WPN network, substation, or load does not comply with such directions within a reasonable

period of time System Management may disconnect the non-WPN network, substation or load from the SWIS without further notification.

2. It should be noted that a non-WPN network, substation or load will only be disconnected as a last resort when System Management have taken all reasonable measures to contact the owner/operator or when the owner/operator has not complied with a reasonable request to disconnect and the secure operation of the SWIS is still being adversely affected.
3. Where a non-WPN network, substation, or load is to be operated unattended or may be unattended at any time, the Network Operator/Market Customer shall provide operational data points to allow System Management to remotely open the main circuit breaker connecting the network, substation, or load to the SWIS.
4. Where the network, substation, or load is operated from a 24 hrs 7 day per week attended control facility, System Management will implement emergency disconnection by opening the circuit breaker(s) at the point of connection in the WPN substation on the circuits through which the non-WPN network, substation, or load are connected to the SWIS.
5. Where the substation concerned has both WPN and non-WPN owned plant the emergency disconnection will be implemented by opening the WPN owned circuit breakers on the WPN transmission lines supplying the substation.

9. ANCILLARY SERVICES

1. Ancillary Service requirements in the WEM are governed by chapter 3 of the WEM Rules together with the Ancillary rules and Procedures issued by System Management.
2. Where non-WPN owned plant is contributing to the Dispatch Support Ancillary service, the Market Customer shall provide the operational data points required to enable System Management to send and receive real time operational data to and from any control facility incorporated in the SCADA system at EPCC. This will include any "handshake" signals to ensure that the communications channels are intact.

10. NETWORK CONTROL SERVICES

1. The Network Control Services requirements in the WEM are governed by Chapter 5 of the WEM Rules.
2. Where a non-WPN owned plant is contributing to the provision of Network Control Services the Network Operator/Market Customer shall include operational data points to enable System Management to monitor and, where agreed, control the operational status of any device that is critical to the provision of these services. This shall include the switching of reactive power compensation devices, SVC control mode (power factor or voltage) selection and related set point commands.

11. NETWORK PROTECTION SCHEMES

1. Where the agreed access conditions include the provision of special network protection schemes, the SCADA operational interface shall include operational data points for the control and monitoring of the network, substation and load. This will include signals to control the output of the substation loads and to provide the local operators with indications that these schemes have operated.

12. COMPLIANCE MONITORING

1. System Management is required to monitor compliance of Market Customers with Load Dispatch Instructions and Advisories. In order to monitor compliance System Management must be able to monitor the operating state of critical operational data points on all non-WPN networks, substations, and loads connected to the SWIS. This will normally be implemented by interfacing data points from the non-WPN network, substation, and loads to a high-speed recording device.
2. Where it has been determined that System Management will monitor the performance of the non-WPN networks, substations and loads, the Network Operator/Market Customer shall provide the operational data points that System Management considers critical to ensuring that the owners/operators of the non-WPN networks, substations or loads are meeting their obligations under the WEM Rules. These operational data points shall be separate to those transmitted to the EPCC and shall normally be interfaced directly with the high-speed recording device.

13. SCADA INTERFACE PERFORMANCE

1. The provision of reliable, accurate and timely operating data to and from the non-WPN networks, substations and loads is critical for System Management to perform its role required by the WEM Rules. The Network Operator/Market Customer shall ensure that the SCADA Operational Interface operates in accordance with the specified performance requirements.
2. The performance Requirements for the SCADA Operational Interface are dealt with in a separate document.

14. SPECIFIED POINTS

The attached tables indicate the types of SCADA Operational Data points that are required. Alarm points may be provided as a single point where points from individual devices are paralleled within the non-WPN network, substation or load facility, or may be provided as individual points from the individual devices concerned. Status points must be provided directly from the auxiliary contacts provided on the device concerned. To ensure adequate redundancy for the Network Analysis facilities in the SCADA system at the EPCC all analogue points must be provided from a direct measurement of the quantities. Summated analogue values are not acceptable

15. COMMUNICATIONS AND CONTROL

1. Clause 2.35.4 of the Wholesale Electricity Market Rules (**WEM Rules**) requires that System Management document the communication and control system requirements needed to support the dispatch process. System Management has done so in the Power System Operation Procedure – Communications and Control
2. This Power System Operation Procedure is additional, and complementary, to the Power System Operation Procedure: Communications and Control Systems. To the extent of any inconsistency, this Power System Operation Procedure applies.

Table 1 - System Management Operational Data Points Requirements for non-WPN Networks and Substation supplying Non-dispatchable Loads

Point Description <input type="checkbox"/>	Transmission Connected and 10 MW or more <input type="checkbox"/>	Transmission Connected and less than 10 MW <input type="checkbox"/>
Status <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
All HV switching devices opened/closed (isolators, earth switches, circuit breakers, etc - 2 complementary contacts ie. NO/NC pair) <input type="checkbox"/>	√ <input type="checkbox"/>	√ <input type="checkbox"/>
Reactive Power device control mode (eg power factor, voltage) <input type="checkbox"/>	R <input type="checkbox"/>	<input type="checkbox"/>
Special Network Protection Device operational status (enabled/disabled) <input type="checkbox"/>	√ <input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Alarms <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HV switching device(s) tripped by protection <input type="checkbox"/>	√ <input type="checkbox"/>	√ <input type="checkbox"/>
HV switching device(s) Protection Defective <input type="checkbox"/>	R <input type="checkbox"/>	<input type="checkbox"/>
Battery Fail - AC and DC <input type="checkbox"/>	R <input type="checkbox"/>	<input type="checkbox"/>
HV switching device(s) Trip Circuit Supervision <input type="checkbox"/>	R <input type="checkbox"/>	<input type="checkbox"/>
HV switching device(s) Trip Supply Supervision <input type="checkbox"/>	R <input type="checkbox"/>	<input type="checkbox"/>
Load Shedding equipment defective <input type="checkbox"/>	√ <input type="checkbox"/>	<input type="checkbox"/>
Special Network Protection operated <input type="checkbox"/>	√ <input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Measured Values <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HV active power import at each HV connection point <input type="checkbox"/>	√ <input type="checkbox"/>	√ <input type="checkbox"/>
HV reactive power import at each HV connection point <input type="checkbox"/>	√ <input type="checkbox"/>	√ <input type="checkbox"/>
HV Load current <input type="checkbox"/>	√ <input type="checkbox"/>	√ <input type="checkbox"/>
Voltages at each HV connection point <input type="checkbox"/>	√ <input type="checkbox"/>	√ <input type="checkbox"/>
Net facility output of active energy (impulse) <input type="checkbox"/>	M <input type="checkbox"/>	M <input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Control <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Emergency Tripping of each HV connection point <input type="checkbox"/>	U <input type="checkbox"/>	<input type="checkbox"/>
Set point control of reactive power devices (power factor and voltage) <input type="checkbox"/>	R <input type="checkbox"/>	<input type="checkbox"/>
Control mode of reactive power devices (power factor/voltage) <input type="checkbox"/>	R <input type="checkbox"/>	<input type="checkbox"/>
Enable/disable automatic control of reactive devices <input type="checkbox"/>	R	
Note 1 : Voltage on Western Power side of Main Switch <input type="checkbox"/> Blank cell = not required <input type="checkbox"/> √ = required <input type="checkbox"/> M = not required if metered <input type="checkbox"/> R = required if WP contracted to provide remote control <input type="checkbox"/> U = required if facility unattended or if WP contracted to provide remort control <input type="checkbox"/>		

Table 2 - System Management Operational Data Points Requirements for non-WPN Networks and Substations supplying Dispatchable, Curtailable, or Interruptible Loads

Point Description <input type="checkbox"/>	Transmission Connected and 10 MW or more <input type="checkbox"/>	Transmission Connected and less than 10 MW <input type="checkbox"/>	Distribution Connected <input type="checkbox"/>
Status <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
All HV and LV switching devices opened/closed (isolators, earth switches, circuit breakers, etc - 2 complementary contacts ie. NO/NC pair) <input type="checkbox"/>	√ <input type="checkbox"/>	√ <input type="checkbox"/>	<input type="checkbox"/>
Reactive Power device control mode (eg power factor, voltage) <input type="checkbox"/>	R <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Special Network Protection Device operational status (enabled/disabled) <input type="checkbox"/>	√ <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Alarms <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HV and LV switching device(s) tripped by protection <input type="checkbox"/>	√ <input type="checkbox"/>	√ <input type="checkbox"/>	<input type="checkbox"/>
HV and LV switching device(s) Protection Defective <input type="checkbox"/>	√ <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Battery Fail - AC and DC <input type="checkbox"/>	√ <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HV and LV switching device(s) Trip Circuit Supervision <input type="checkbox"/>	√ <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HV and LV switching device(s) Trip Supply Supervision <input type="checkbox"/>	√ <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Load Shedding equipment operated <input type="checkbox"/>	√ <input type="checkbox"/>	√ <input type="checkbox"/>	√ <input type="checkbox"/>
Load Shedding equipment defective <input type="checkbox"/>	√ <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Special Network Protection operated <input type="checkbox"/>	√ <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Measured Values <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HV and LV active power import at each connection point <input type="checkbox"/>	√ <input type="checkbox"/>	√ <input type="checkbox"/>	<input type="checkbox"/>
HV and LV reactive power import at each connection point <input type="checkbox"/>	√ <input type="checkbox"/>	√ <input type="checkbox"/>	<input type="checkbox"/>
HV and LV voltages at each point of connection <input type="checkbox"/>	√ <input type="checkbox"/>	√ <input type="checkbox"/>	<input type="checkbox"/>
Net facility output of active energy (impulse); (not required if metered) <input type="checkbox"/>	M <input type="checkbox"/>	M <input type="checkbox"/>	M <input type="checkbox"/>
Dispatchable/Curtailable/Interruptible Load active power demand per stage <input type="checkbox"/>	√ <input type="checkbox"/>	√ <input type="checkbox"/>	√ <input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Control <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Emergency Tripping of Facility <input type="checkbox"/>	U <input type="checkbox"/>	√ <input type="checkbox"/>	<input type="checkbox"/>
Set point control of reactive power devices (power factor and voltage) <input type="checkbox"/>	R <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Control mode of reactive power devices (power factor/voltage) <input type="checkbox"/>	R <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Enable/disable control of reactive devices <input type="checkbox"/>	R		

Note 1 : Voltage on Western Power side of Main Switch <input type="checkbox"/>
Blank cell = not required <input type="checkbox"/>
√ = required <input type="checkbox"/>
M = not required if metered <input type="checkbox"/>
R = required if WP contracted to provide remote control <input type="checkbox"/>
U = required if facility unattended or if WP contracted to provide remote control <input type="checkbox"/>

Draft

ELECTRICITY INDUSTRY ACT

ELECTRICITY INDUSTRY (WHOLESALE
ELECTRICITY MARKET) REGULATIONS 2004

WHOLESALE ELECTRICITY MARKET RULES

Power System Operation Procedure:

Medium Term Projected Assessment of System Adequacy (MT PASA)

Commencement: This Market Procedure is to have effect from 8:00am (WST) on the same date as the Wholesale Electricity Market Rule, in which this procedure is made in accordance with, commences.

Market Procedures Published by the Minister

I, FRANCIS LOGAN, Minister for Energy for the State of Western Australia, under regulation 9(2) of the *Electricity Industry (Wholesale Electricity Market) Regulations 2004* hereby approve the publication of the Power System Operation: Medium Term Projected Assessment of System Adequacy (MT PASA) Procedure contained in this document.

This Market Procedure is to have effect from 8:00am (WST) on the same date as the Wholesale Electricity Market Rule, in which this procedure is made in accordance with, commences.

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Dated at Perth this day of 2006.

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1. RELATIONSHIP WITH MARKET RULES

1. This document sets out in accordance with clause 3.16.10 of the Western Australian Wholesale Electricity Market Rules, the procedures that System Management and Rule Participants must follow in the preparation and publication of the Medium Term Projected Assessment of System Adequacy report (MT PASA). This procedure is made in accordance with Market Rule 3.16.10.
2. System Management must use the assembled data through the MT PASA process to assist it with respect to **[MR 3.16.3]**:
 - a setting Ancillary Service Requirements over the year;
 - b Outage planning for Registered Facilities; and
 - c assessing the availability of Facilities providing Capacity Credits, and the availability of other capacity.
3. An overview of the MT PASA process is shown in Appendix III of this procedure.

2. ASSOCIATED PROCEDURES AND OPERATING STANDARDS

- a. Power System Operation Procedure - ST PASA;
- b. Power System Operation Procedure – Power System Security; and
- c. Power System Operation Procedure – Facility Outages.

3. TIMETABLE FOR PRODUCING THE MT PASA REPORT

1. System Management must carry out a Medium Term PASA study by the fifteenth of each month **[MR 3.16.1]**.
2. The Medium Term PASA study must consider each week of a three year planning horizon, starting from the month following the month in which the Medium Term PASA study is performed **[MR 3.16.2]**.
3. System Management must provide the completed report to the IMO before 3.00 PM of that day.
4. Market Participants must provide the data necessary for System Management to carry out the MT PASA study by the end of the fifth day of each month or ten days prior to the date on which the MT PASA study incorporating the data is published.

4. INFORMATION TO BE PROVIDED BY PARTICIPANTS.

4.1 General requirements

1. Participants must provide the information System Management requests, and any other data they are aware of that might be relevant to a Medium Term PASA study, within the timeframe specified in section 3 of this procedure **[MR 3.16.7]**.

2. The data should represent the Participant's reasonable estimates of their future plans over the three year planning period.
3. The data should be sent through System Management's SMMITS interface system in the format specified in sections 4.2 to 4.4 of this procedure.
4. The data provided by Participants will be published in MT PASA in aggregate form and will not refer to a specific Participant or Participant's facilities.

4.2 Data to be provided by Network Operators:

5. Network Operators must provide the information set out in this section to System Management in respect of each day in the three year MT PASA planning period.

Future changes to transmission capacities

6. The information must include future changes to transmission capacities and ratings of equipment, to the extent that these have been planned at the time of providing the data. This will include all new or upgraded equipment that increases the capability of the network to transfer energy into, across and out of the network.
7. The information must also include changes to equipment that increases the security and dynamic stability of the network under high transmission loading.
8. The information should be provided through System Management's SMMITS system in the format set out in Appendix I of this procedure.

Confirmation of outage plans

9. Network Operators should provide confirmation of the continuing applicability and validity of its Outages Plans. Where the Outage Plans are not up to date, or the Network Operator is planning to amend these plans, it should inform System Management of the proposed changes.

Future access quantities and load connections

- 6 Network Operators should provide information on future access quantities applying at entry and exit points to its network. This will include for each network entry or exit point the maximum half-hourly off-take or injection energy permitted under all prevailing agreements for access.
- 7 Where there is more than one Market Customer at an exit point, the maximum energy off-take figure provided should be the maximum off-take permitted for the combined Market Customers at that point.
- 8 Network Operators should provide information on any significant new commercial or industrial consumer anticipated to start up and connect to the SWIS, or to close down, within the next three years. A significant load refers to a consumer load greater than 20 MW peak demand.

4.3 Market Generators

1. Market Generators must provide the information set out in this section to System Management in respect of each day in the three year MT PASA planning period.

Planned future changes

2. Planned future changes to generating facility capabilities and Ancillary Service capabilities. This will include all new or upgrades that increase the nameplate rating of Scheduled and Non-scheduled generation facilities.
3. The information should be provided through System Management's SMMITS system in the format set out in Appendix II of this procedure.

Confirmation of previous outage plans

4. Market Generators should provide confirmation of the continuing applicability and validity of its outage plans in the current outage schedule. Where the information is not current, or the Market Generator is planning to amend its outage plans, it should inform System Management of these proposed changes.

Proposed closure of a Facility

5. Any proposed closure of a Generation Facility in respect of each day in the three year MT PASA planning period.

Energy constraints

6. Any energy constraint anticipated to occur in any week in the three year planning period. This will include information on any situation where a shortage in fuel supply is anticipated to reduce the capability of a generation facility to operate at its normal maximum output.

Non-Scheduled Generators

7. Estimated weekly energy output for Non-Scheduled Generators, where the peak output of the Non-Scheduled Generating facility is in excess of 20 MW.
8. The Market Generator may, for the purpose of assisting with MT PASA preparation, provide data on expected maximum and minimum MW output from its Non-Scheduled Generation Facilities for the peak demand periods specified in Table 1.

Table 1

Season	Weekday Morning	Weekday Evening
Winter	7.00-9.00 AM	5.00-8.00 PM
Summer	-	Midday to 6.00 PM

4.4 Market Customers:

1. Market Customers must provide the information set out below to System Management in respect of each week of the three year planning period.

Planned future changes

2. Market Customers must provide information on possible changes to Curtailable Load and Interruptible Load Facilities planned in the next three years.
3. The information should be provided in the format set out in Appendix III of this procedure.

Availability of Demand Side Management capacity

4. Market Customers should provide confirmation of the continuing applicability and validity of its outage plans in the current outage schedule. Where the information is not current, or the Market Customer is planning to amend its outage plans, it should inform System Management of these proposed changes.

4.5 Additions and Omissions in Participant Data

1. System Management must review the information provided by Market Participants and Network Operators, and where necessary, seek additional information or clarifications [MR 3.16.8].
2. Participants must provide any additional information or clarifications requested as soon as practical, and within at least 2 business days of the time of the request [MR 3.16.8].
3. Where System Management has not received information from a Market Participant or Network Operator in the time required or there are omissions or possible errors in the information, System Management may contact the Participant to seek clarification or further details.
4. The Participant must respond to this request in the earliest time practical.

5. PREPARATION OF A MT PASA DEMAND FORECAST

5.1 General

1. System Management must prepare an aggregate forecast of peak system MWh load in each region of the SWIS and for the SWIS as a whole, for each day of the MT PASA planning horizon.
2. The boundaries of the network regions will be determined by the presence of transmission constraints that limit the capability of the network to transmit energy into or out of that region at times of peak daily load.
3. Peak system load is the peak MW demand on the transmission network, and represents the sum of the peak consumer demand at the network off-take points plus the distribution and transmission losses occurring within the network at that time.

5.2 Information for preparing MT PASA forecast

1. In preparing the MT PASA forecast, System Management must consider all information provided by Participants as well as:
 - a. the Long Term PASA report published by the IMO;
 - b. seasonal, weekly and daily patterns of electricity usage monitored by System Management; and
 - c. other sources of forecast information deemed relevant by System Management.
2. System Management may also use information developed by System Management in relation to [MR 3.16.5]:
 - a. SWIS Operating Standards;
 - b. Ancillary Service Requirements; and
 - c. Ancillary Service Contracts.
3. In conducting a Medium Term study, System Management may, in place of information provided by Participants, use information developed by System Management [MR 3.16.6].

5.3 MT PASA Load Forecast

1. System Management must prepare a Medium Term PASA system load forecast using the data and information provided as a consequence of sections 4 and 5 of this procedure.
2. The forecast of system load must be derived for each day of the MT PASA planning horizon after reviewing the available forecast information, and taking account of the information from Network Operators on new industries and connections growth. This forecast will be designated the "Medium Term PASA system load forecast".
3. The information contained in the Medium Term PASA load forecast will include for each day of the MT PASA planning period:
 - a. a "mean" forecast of system load showing the expected daily peak for each SWIS region and for the SWIS as a whole;
 - b. a "mean plus one standard deviation" forecast of the expected daily peak load for each region and for the SWIS;
 - c. a "mean plus two" standard deviation forecast of the expected daily peak load for each region and for the SWIS; and
 - d. a mean forecast of the minimum overnight load on the SWIS, based on the minimum MWh value forecast in a Trading Interval.

5.4 System Management to publish Load Forecast Methodology

1. System Management must describe in the first MT PASA report published a description of the methodology used in preparing the MT PASA system load forecasts.

2. System Management must also list the sources of information used and include an explanation of how these sources were utilised in the final MT PASA system load forecast.

6. MT PASA PLANNING CRITERIA

6.1 General

1. System Management must allow in its assessment of power system security and adequacy for both planned and unplanned outages of generation, demand and transmission facilities.
2. The allowance for unplanned (forced) outages must be sufficient to provide Participants with a reasonable level of confidence that day to day peak loads will be met without risk to supply or consumer confidence.
3. The allowance for unplanned (forced) outages may vary according to the class of facility involved.

6.2 Generation Security

System Management must allow for sufficient generation to be available to meet:

- a. the unplanned (forced) non-availability of the largest single generating unit on the SWIS at the time; and
- b. the SWIS Security Criteria specified in the Power System Operations Procedure – Power System Security.

6.3 Transmission security

System Management must allow for sufficient transmission facilities to be available to cater for all credible contingencies specified in the SWIS Security Criteria.

6.4 Demand Management Adequacy

System Management must plan on the basis that all Demand Management schemes of which it is informed will be available when preparing the MT PASA study

6.5 Ancillary Services

System Management must plan on the basis that all Ancillary Services of which it is aware will be available, after taking account of all planned outages and the non-availability of the generation and transmission facilities referred to in sections 6.2 and 6.3 of this procedure.

7. MT PASA CAPACITY PLANNING MARGIN

7.1 General

1. System Management must assess the “MT Capacity Planning Margin” for each day of the MT PASA planning horizon by using the criteria set out in section 7.1 of this procedure.

2. The MT Capacity Planning Margin is the spare generation capacity available after the forecast peak load has been met, all planned outages and forced outage allowance been taken into account, demand management capability has been utilised, and all security standards and ancillary service requirements have been satisfied.

7.2 Assessment of Capacity Planning Margin

1. System Management will estimate the level of Capacity Planning Margin each day of the MT planning horizon by forecasting
 - a. the capacity of the total Generation and Demand Side Management Facilities after allowing for the outages that System Management have been informed of and including an assessment by System Management of the expected output from non-scheduled generation facilities, less
 - b. the mean plus two standard deviation system load forecast from section 5 of this procedure, less
 - c. the effects of any Generation or Demand Management Capacity being constrained off due to insufficient transmission capacity remaining in service, less
 - d. an allowance for that quantity of generation capacity required to operate as an Ancillary Service, to maintain the frequency standards specified in the Power System Security Procedure and any applicable SWIS standards, less
 - e. an allowance for the unplanned non-availability of generation facilities, as quantified within the planning criteria set out in section 6 of this procedure.

8. CONTENT OF MT PASA

8.1 General

1. The MT PASA study prepared and published each month by System Management must set out the forecast value of the MT Capacity Planning Margin and other aggregated data relevant to the medium term security assessment of the SWIS system.
2. Where practical, the information should be presented in graphical form similar to but not restricted to the graphical presentation in Appendix V of this procedure, and cover each day of the MT PASA planning horizon.

8.2 Aggregate forecast information on MT PASA

1. System Management must include in the MT PASA report the information listed in table 2 below for each day of the MT PASA planning horizon. Information that explains the derivation or basis of these parameters is set out in Appendix IV of this procedure.

	MT PASA REPORTING PARAMETERS	DESCRIPTION OF PARAMETER
1	MT Capacity Planning Margin	Refer Section 7
2	Peak Load Forecasts	The peak load estimate for the SWIS for the following scenarios: i. mean; ii. mean plus one standard deviation; and iii. mean plus two standard deviations.
4	Forecast total installed generation capacity	The total installed generation capacity forecast to be installed over the planning horizon
5	Forecast total available Generation Capacity	The total available Generation Capacity forecast to be available over the planning horizon, after taking account of planned outages
6	Forecast total available Demand Management Capacity	The total available Curtailable Load Management capacity available at the time of the daily peak.
8	Transmission Constrained Capacity	Any generation capacity output constrained at the time of peak SWIS demand as a consequence of transmission limitations.
9	Provision for unplanned loss of Generation Facilities	The provision for unplanned un-availability of generation facilities (forced outages).
10	Ancillary Services	The quantity of generation capacity diverted to serve as an ancillary service, and not available for energy supply purposes
11	Negative Capacity Planning Margin	Highlighting of periods when the MT Capacity Planning Margin is negative

8.3 Explanatory Information to be included with MT PASA

1. System Management must include as an attachment to the MT PASA report additional information to assist Participants in understanding and utilising the information in MT PASA.
2. The additional information should focus on explaining events and situations that have led, or are likely to lead, to security issues and possible shortfalls in supply capacity.
3. Where there are significant differences in the level of MT Capacity Planning Margin between consecutive MT PASA reports, and where these are due to factors other than a change of Outage Plans, System Management must endeavour to highlight these changes in the new report and where practical, provide an explanation.
4. System Management must also provide information on the following areas of performance where they are relevant to ongoing capacity requirements of the SWIS and ancillary service planning.

Transmission outages and constraints

5. Information on regions of the SWIS subject to transmission constraints, where these constraints are creating a limitation on the output of generation capacity when meeting the daily peak system load.

6. This information should include transmission outages of which System Management is aware, forecast transmission capacity between potentially constrained regions, and any constraints that as a consequence are considered likely.

Special security problems

7. System Management must set out any additional information it is aware of on possible security problems that could affect market or dispatch outcomes.

Fuel Supply to Generating Stations

8. System Management must set out information on potential fuel supply, transport or fuel storage limitations that System Management is aware of that could affect the quantity of available generation capacity.

Availability of Non-scheduled Generation Capacity

9. Information on System Management's estimate of the quantity of non-scheduled generation capacity that can reasonably be expected to be available at the time of the daily peak SWIS loads.

8.4 Information provided or developed by System Management

1. System Management must include with the MT PASA report details of any data developed and used by System Management in place of data provided by Participants, and the reasons why System Management's data was substituted.
2. System Management must provide a description of the load forecast methodology used by System Management in preparing the MT PASA load forecast.
3. The description must be provided as part of the first MT PASA report published by System Management, and will be updated by System Management as the forecasting model is modified or further enhanced.

9. CONFIDENTIALITY OF INFORMATION

1. In performing its functions under the Market Rules, System Management may be required to disclose certain information to Market Participants and Network Operators. In selecting the information which may be disclosed, System Management will utilise best endeavours and act in good faith to disclose only the information reasonably required by the application of the Market Rules.
2. Where System Management has received information from a Market Participant or Network Operator as a consequence of the information requirements of MT PASA and the information is specific to and identifiable with the operations of the latter, System Management will first notify that Participant of an intention to report the information in MT PASA.

3. Where that Participant considers the information to be commercially sensitive and confidential it should communicate this to System Management.
4. Where System Management considers that release of the information is important to the security of the power system, System Management will refer the matter to the IMO for consideration under chapter 10 of the Market Rules and the applicable Market Information Disclosure Procedures.

10. NOTIFICATION OF NON-CONFORMING OUTAGES

1. After publication of the MT PASA report, System Management will contact any Market Participant or Network Operator who has an Outage Plan that has been identified in the MT PASA report as causing a conflict with the aim of maintaining a positive MT Capacity Planning Margin.
2. The subsequent actions of System Management and the affected Participant must be in accordance with the Power System Operating Procedures - Facility Outages.

Appendix I NETWORK OPERATOR INFORMATION

Each Network Operator should provide System Management with the following data.

1. Upgrades and Changes to Network facilities

Details of any new, upgraded or decommissioned network facility expected within the next three years.

Table 6

Information Required	Details
Facility location and terminals	
Nature of Work	New plant, upgrade or decommissioning
Class of Equipment	Circuit/transformer/ voltage control facility
Commissioning/decommissioning date	Planned date
Design Rating –Static	Voltage, MW, MVA _r or MVA
Design Rating – Dynamic	Any overload or short term capability
Design Availability	Expected availability
Operational Arrangements	Any specific operational arrangements that affect availability or performance

2. Changes to SCADA, Protection or Communication Systems

Network Operators should inform System Management of any plans to upgrade or modify protection or communications systems that, in the opinion of the Network Operator, might change the reliability and security of the SWIS power system.

1. Upgrades and Changes to Scheduled Generation facilities

Each Market Generator should provide System Management with the following details of any new, upgraded or decommissioned Scheduled Generation facilities expected within the next three years.

Table 7

Information Required	Details
Facility location	Location
Nature of Work	New generation plant, upgrades or decommissioning
Commissioning/Decommissioning data	Planned date
Fuel	Fuel supply arrangements
Design load and/or peaking factor	Annual load factor
Design Rating –Static	Name plate MW rating and power factor
Design Rating – Dynamic	Any overload or short term capability
Design Availability	Expected availability
Operational Arrangements	Any specific operational arrangements that affect availability or performance

2. Upgrades and Changes to Ancillary Service Supply Cap[ability]

Table 8

Information on changes to Generation Facility that relate to changes in the capability of the Facility to provide Ancillary Services	
Load Following Reserve	Changes to Load following capability
Spinning Reserve	Changes to capability of facility to supply spinning reserve (6 seconds to 15 minutes)
Black Start Reserve	Changes in capability of facility to supply Black Start

3. Upgrades and Changes to Non-Scheduled Generation Facilities

Table 9

Information relating to Non-scheduled Generator facilities	
Facility Identity	
Name plate rating of Facility (MW)	
Commissioning / decommissioning data	Planned date
Fuel	Fuel supply arrangements
Reactive Capability of facility	MVA _r lagging and leading
Estimate maximum energy output per week of MT PASA planning horizon	
Estimate mean energy output per week of MT PASA planning horizon	
Estimate minimum energy output per week of MT PASA planning horizon	
Operational Arrangements	Any specific operational arrangements that affect availability or performance

Appendix III MARKET CUSTOMER INFORMATION

1. Upgrades and Changes to Demand Management Facilities

Each Market Customer should provide System Management with the following details of any new, upgrade or decommissioned demand management facility expected within the next three years.

Table 10

Information Required	Details
Location of facility	The bulk substation supplying the distribution network to which the facility is connected
Nature of Demand Management (DM) Extension, upgrade, or decommissioning	New demand generation plant, upgrades or decommissioning
Commissioning data	Planned commissioning date
Design Capacity	Load curtailment or interruption capacity
Capacity credits associated with DM scheme	MW of capacity
Availability of DM scheme	Planned utilisation and availability of DM scheme
Details if DM registered as an Interruptible load	Category of spinning reserve capability
Operational Arrangements	Any specific operational arrangements that affect availability or performance

APPENDIX IV CONTENT OF MT PASA STUDY

MT Capacity Planning Margin

1. The Medium Term Capacity Planning Margin as specified in Section 8

Peak Load Forecasts

2. The peak load estimate for the SWIS including the following load demand scenarios:
 - i. mean;
 - ii. mean plus one standard deviation; and
 - iii. mean plus two standard deviations.

Forecast total installed available generation capacity

3. The total installed generation capacity in each constrained region and in the SWIS, including both Scheduled and Non-Scheduled Generation Facilities

Forecast total installed available Generation Capacity

4. The total available generation capacity forecast in each region and in the SWIS, after allowing for the information on planned non-availability of generation equipment as provided under section 6.2.
5. In making its assessment of available generation capacity, System Management should provide an explanation of its estimate of the contribution of non-scheduled generation in each region towards meeting the daily peak load

Available Demand Side Management capacity

6. System Management must assess the quantity of total available Demand Management capacity in each region of the SWIS and in the entire SWIS. The quantity of Demand Management capacity assessed must be that amount that is available over the time of the daily peak SWIS load, and that can reduce the level of peak demand supplied by the combined generation system.
7. System Management must ensure that the duration and frequency of operation of the Demand Management Facilities assumed for the MT PASA study is permissible based on the information held by System Management for the Facility.

Margin of Available Generation Capacity over Demand

8. The margin between available generation capacity and demand will be estimated from:
 - a. the total forecast available generation capacity; minus
 - b. the mean load plus two standard deviation forecast; plus

- c. the total available Demand Management capacity

Transmission Constraints

- 9. The quantity of Generation output that is expected to be constrained off at the time of the SWIS peak as a consequence of constraints on the transmission network.

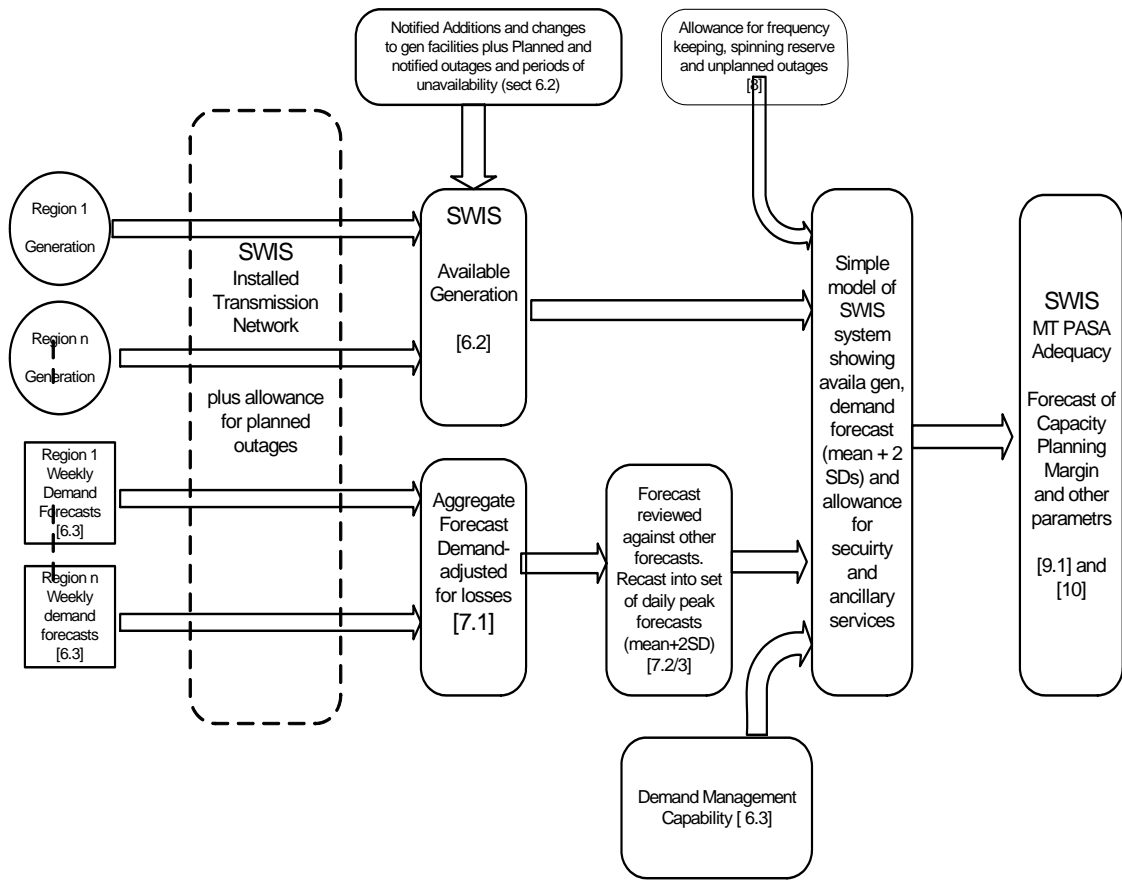
Ancillary Services

- 10. The quantity of generation capacity that is diverted to serve as an ancillary service, and therefore not available for energy supply purposes. Ancillary services include:
 - a. Load following reserve; and
 - b. Spinning Reserve.
- 11. While Ready Reserve is not treated as an Ancillary Service in the Wholesale Electricity Market Rules, System Management may identify possible shortfalls in Power System Adequacy due to shortages in Ready Reserve.

Provision for unplanned loss of Generation Facilities

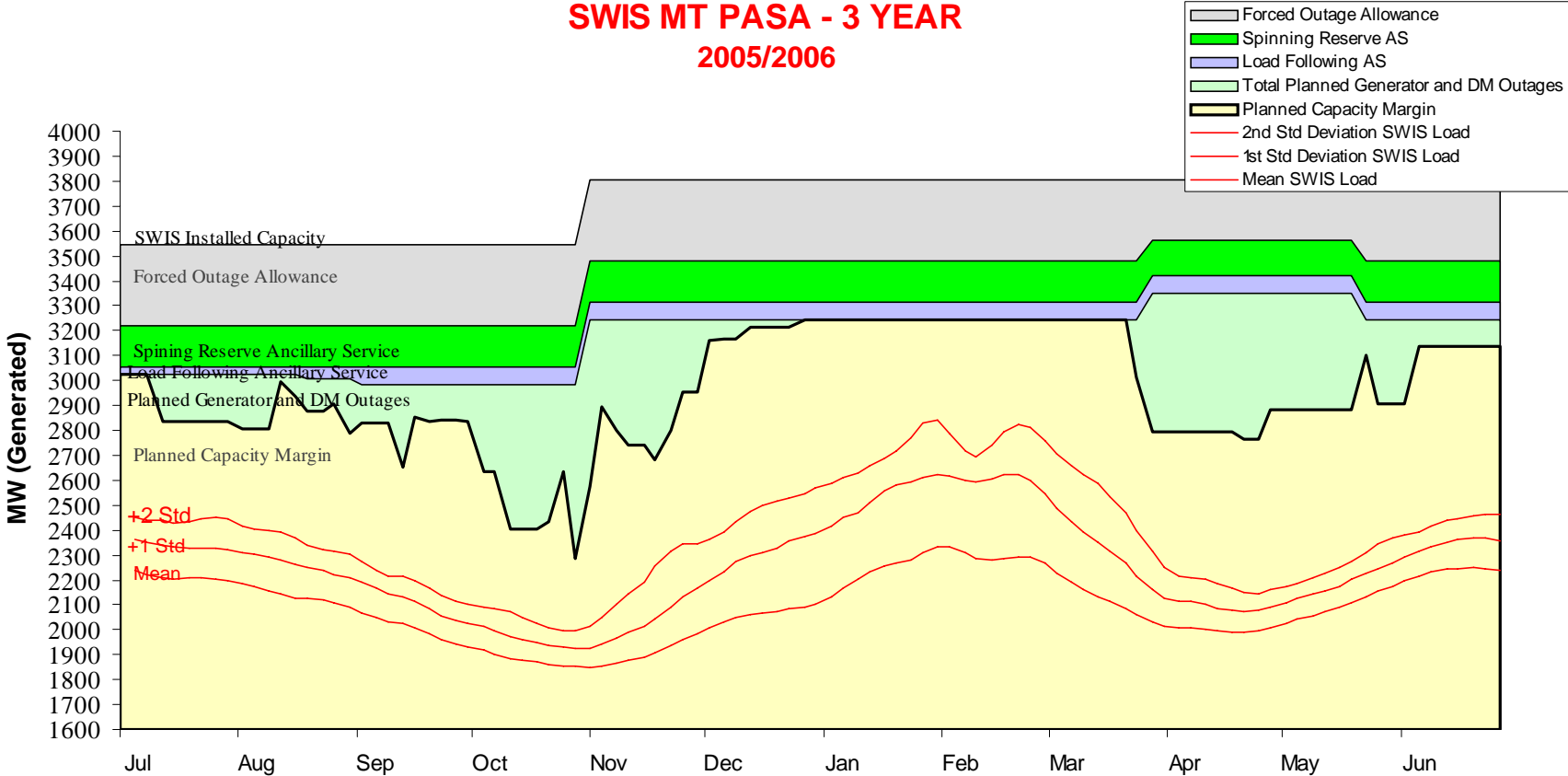
- 12. The provision System Management has made for the unplanned loss or unavailability of generation facilities in accordance with the MT PASA Planning Criteria. (Section 6 of this procedure).

Appendix V OVERVIEW OF MT PASA PROCESS



APPENDIX VI SAMPLE OF POSSIBLE MT PASA GRAPHICAL OUTPUT

**SWIS MT PASA - 3 YEAR
2005/2006**



ELECTRICITY INDUSTRY ACT

ELECTRICITY INDUSTRY (WHOLESALE
ELECTRICITY MARKET) REGULATIONS 2004

WHOLESALE ELECTRICITY MARKET RULES

**Power System Operation
Procedure:**

**Medium Term Projected Assessment
of System Adequacy (MT PASA)**

Commencement: This Market Procedure is to have effect from 8:00am (WST) on the same date as the Wholesale Electricity Market Rule, in which this procedure is made in accordance with, commences.

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1. MEDIUM TERM PROJECTED ASSESSMENT OF SYSTEM ADEQUACY (MT PASA)

Medium Term Projected Assessment of System Adequacy ('MT PASA') details procedures that System Management and Rule Participants must follow in the preparation and publication of the Medium Term Projected Assessment of System Adequacy report.

2. RELATIONSHIP WITH MARKET RULES

1. This Procedure has been developed in accordance with, and should be read in conjunction with clause 3.16 of the Wholesale Electricity Market (WEM) and Rules (Market Rules).
2. References to particular Market Rules within the Procedure in bold and square brackets **[MR XX]** are current as at 1 November 2008. These references are included for convenience only, and are not part of this procedure.
3. In performing its functions under the Market Rules, System Management may be required to disclose certain information to Market Participants and Network Operators. In selecting the information that may be disclosed, System Management will utilize reasonable endeavours and act in good faith to disclose only the information reasonably required by the application of the Market Rules.

3. SCOPE

The MT PASA Procedure details processes that Rule Participants and System Management must follow in conducting Medium Term PASA studies to assist System Management in setting Ancillary Service Requirements over the year, outage planning for Registered Facilities, assessing the availability of Facilities providing Capacity Credits and other capacity, amongst other functions associated with the management of Power System Security and Power System Reliability in the SWIS.

Similarly, Short Term Projected Assessment of System Adequacy studies are derived from a common formulation, but is instead based on a shorter three week planning horizon.

4. ASSOCIATED PROCEDURES AND OPERATION STANDARDS

The following Power System Operation Procedures are associated with this MT PASA procedure:

- a. Power System Operation Procedure - ST PASA;
- b. Power System Operation Procedure – Power System Security; and
- c. Power System Operation Procedure – Facility Outages.

5. TIMETABLE FOR MT PASA

1. The timing requirements that System Management must follow when completing and reviewing a Medium Term PASA study, the provision of this information to the Independent Market Operator ('IMO'), and the IMO's obligation to publish the relevant information are defined in the Market Rules **[MR 3.16.1, MR 3.16.2 and MR 3.16.9]**.
2. System Management will prepare and maintain an internal process detailing how and by which method the MT PASA results are transmitted to the IMO.

6. INFORMATION REQUIREMENTS

6.1 General Requirements

1. System Management may direct Rule Participants in writing from time to time, to provide the information specified in the Market Rules **[MR 3.16.4]**.
2. Rule Participants must use reasonable endeavours to provide System Management with a reasonable estimate of the amount of demand side management capacity that can be provided.
3. With the exception of demand side management, where information is provided by Network Operators, Market Generators and Market Customers this information must be provided via the System Management Market Information Technology ('SMMITS') web interface system, unless otherwise directed.
4. Rule Participants must provide demand side management related information to System Management via email, unless otherwise directed.

6.2 Use of information developed by System Management

1. System Management may utilise its own information in certain circumstances in substitution of information submitted by Rule Participants in accordance with the Market Rules **[MR 3.16.6]**, and shall document reasons for doing so in the MT PASA report.
2. In addition to information provided by a Rule Participant, System Management may use information that it develops pursuant to the Market Rules **[MR 3.16.5]**, and any other information System Management considers necessary.

6.3 Additions and Omissions in Participant Data

1. System Management shall review information provided by Rule Participants, and where necessary, seek additional information or clarifications. Rule Participants must provide any additional information or clarifications when requested by System Management in accordance with the Market Rules **[MR 3.16.8 and MR 3.16.8A]**.
2. The participant must respond to this request in the earliest time practical.

7. MT PASA LOAD FORECAST

7.1 General

1. System Management must prepare an aggregate forecast of peak system MW load for the SWIS and, where necessary each region of the SWIS, for each day of the MT PASA planning horizon using System Management's modelling and forecasting system.
2. Peak system load is defined as the peak MW demand on the transmission network, which is represented by the sum of the peak consumer demand at the network off-take points plus the distribution and transmission losses occurring within the network at that time.
3. In preparing the MT PASA forecast, System Management must consider all information provided by Participants as well as:
 - a. Seasonal, weekly and daily patterns of electricity usage monitored by System Management; and
 - b. Other sources of forecast information deemed relevant by System Management.

7.2 MT PASA Load Forecast

System Management must ensure that the results of a Medium Term PASA study includes, for the Medium Term PASA Planning Horizon, the peak load forecasts for scenarios stipulated in the Market Rules **[MR 3.16.9(a) and MR 3.16.9(b)]**.

1. System Management must forecast for each day of the MT PASA planning period:
 - a. a "mean" forecast of system load showing the expected daily peak for each SWIS region and for the SWIS as a whole;
 - b. a "mean plus one standard deviation" forecast of the expected daily peak load for each region and for the SWIS;
 - c. a "mean plus two" standard deviation forecast of the expected daily peak load for each region and for the SWIS; and

8. MT PASA PLANNING CRITERIA

8.1 Generation Security

System Management must allow for sufficient generation to be available to cater for forced outages of generation facilities. The value of unplanned unavailability will be the loss of the largest total generation, remaining after outages have been accounted for, resulting from a single contingency event.

8.2 Transmission security

System Management must adjust total generation to take account of any constraints on the transmission system, after allowing for all credible contingencies specified in the PSOP: Power System Security and maintain operations within the boundaries of the Technical Envelope.

8.3 Ancillary Services

System Management must allow for sufficient Ancillary Services and Ready Reserve generation to be available, taking into account the non-availability of facilities that provide Ancillary Services to meet the criteria specified in the PSOP: Power System Security and maintain operations within the boundaries of the Technical Envelope.

8.4 Demand Management

System Management must prepare the MT PASA based on a reasonable forecast of the availability of all Interruptible Loads.

9. MEDIUM TERM PASA RESERVE MARGIN

9.1 General

1. System Management must assess the “Medium Term Reserve Margin” for each day of the MT PASA planning horizon.
2. The Medium Term Reserve Margin is the spare generation capacity available after the forecast peak load has been met, all planned outages and forced outage allowance been taken into account, and all security standards and Ancillary Service requirements have been satisfied.

9.2 Assessment of Reserve Margin

System Management must estimate the applicable Reserve Margin by forecasting:

- a. the capacity of the total Generation after allowing for Planned, Scheduled and any other outages that System Management has knowledge of or has been informed of, less
- b. the mean plus two standard deviation system load forecast, less
- c. the effects of any Generation being constrained due to insufficient transmission capacity remaining in service, less
- d. an allowance for that quantity of generation capacity required to operate as an Ancillary Service, to maintain the frequency standards specified in the PSOP: Power System Security, less
- e. as quantified within the planning criteria set out in section 8 of this procedure.

10. CONTENT OF MEDIUM TERM PASA STUDY RESULTS REPORT

10.1 General

1. The MT PASA Study Results Report (the MT PASA report) prepared and published each month by System Management must set out the forecast value of the Medium Term Reserve Margin, the data set out in the Market Rules, and other data relevant to the medium term security assessment of the SWIS.
2. Where practical, the information should be presented in graphical form in SMMITS and cover each period of a three year MT PASA planning horizon.

10.2 Aggregate forecast information on MT PASA

System Management must include in the MT PASA report the information set out in the Market Rules **[MR 3.16.9]** and the additional information listed in table 1 below for each day of the MT PASA planning horizon.

Table 1		
	MT PASA REPORTING PARAMETERS	DESCRIPTION
1	MT Reserve Margin	The quantity defined in Market Rule [MR 3.16.9(d)] and being for each study period, the mean plus 2 standard deviation peak load forecast, minus the total forecast available generation capacity.
2.	Peak Load Forecasts	The peak load estimate for the SWIS for the following scenarios: i. mean; ii. mean plus one standard deviation; and iii mean plus two standard deviations.
3.	Forecast total available Generation Capacity	The total available Generation Capacity forecast to be available over the planning horizon, after taking account of planned outages.
4.	Forecast total available Demand Management Capacity	The total available Demand Side Management capacity available at the time of the daily peak.
5.	Transmission Constrained Capacity	Any generation capacity output constrained at the time of peak SWIS demand as a consequence of transmission limitations.
6.	Provision for unplanned loss of Generation Facilities	The provision for unplanned un-availability of generation facilities (forced outages).
7.	Ancillary Services	The quantity of generation capacity diverted to serve as an ancillary service, and not available for energy supply purposes.
8.	Negative Capacity Planning Margin	Highlighting of periods when the MT Capacity Planning Margin is negative.

10.3 Explanatory Information to be included with MT PASA

1. System Management may include as an attachment to the MT PASA report additional information to assist Participants in understanding and utilising the information in MT PASA.
2. System Management should use reasonable endeavours to provide explanation of changes where there are significant differences in the level of Reserve Margin between consecutive ST PASA reports.

11. AGGREGATION OF INFORMATION

In publishing the MT PASA report, System Management will endeavour to ensure that as much as practical, individual participant's data submitted to System Management cannot be identified. Information will be published in aggregate form for each class of Market Participant.

ELECTRICITY INDUSTRY ACT

ELECTRICITY INDUSTRY (WHOLESALE ELECTRICITY MARKET) REGULATIONS 2004

WHOLESALE ELECTRICITY MARKET RULES

Power System Operation Procedure

Short Term Projected Assessment of System Adequacy (ST PASA)

Commencement: This Market Procedure is to have effect from 8:00am (WST) on the same date as the Wholesale Electricity Market Rule, in which this procedure is made in accordance with, commences.

Market Procedures Published by the Minister

I, FRANCIS LOGAN, Minister for Energy for the State of Western Australia, under regulation 9(2) of the Electricity Industry (Wholesale Electricity Market) Regulations 2004 hereby approve the publication of the Power System Operation: Short Term Projected Assessment of System Adequacy (ST PASA) Procedure contained in this document.

This Market Procedure is to have effect from 8:00am (WST) on the same date as the Wholesale Electricity Market Rule, in which this procedure is made in accordance with, commences.

.....

Dated at Perth this day of 2006.

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1. RELATIONSHIP WITH MARKET RULES

This document sets out, in accordance with clause 3.17.10 of the Western Australian Wholesale Electricity Market Rules, the procedures that System Management and Market Participants must follow in the preparation of the Short Term “Projected Assessment of System Adequacy” study (ST PASA).

System Management must use the Short Term PASA study to assist it in:

- a. setting Ancillary Service Requirements in each six-hour period during the Short Term PASA planning horizon;
- b. assessing final approval of Planned Outages; and
- c. assessing the availability of capacity holding Capacity Credits in each six hour period during the Short Term PASA Planning Horizon

An overview of the ST PASA process is set out in Appendix IV of this procedure.

This procedure is made in accordance with Market Rule 3.17.10.

2. ASSOCIATED PROCEDURES AND OPERATING STANDARDS

- a. Power System Operation Procedure – Power System Security
- b. Power System Operation Procedure – Facility Outages
- c. Power System Operation Procedure - Medium Term PASA

3. TIMETABLE FOR ST PASA

1. System Management must carry out a Short Term PASA study every Thursday, and provide the results to the IMO by 4.30 PM of that day **[MR 3.17.1]**.
2. The Short Term PASA study must consider each six-hour period of a three week planning horizon starting from 8 AM on the day following the day on which the Short Term PASA study is performed **[MR 3.17.3]**.
3. Where System Management determines that changes have occurred that would materially affect market outcomes during the first week of the period covered by the previous Short Term PASA study, System Management must carry out an additional ST PASA study containing these changes at the earliest practical time.
4. The additional Short Term PASA results must be provided to the IMO as soon as practical.
5. IMO must publish the ST PASA report before the close of business on the day it receives the report from System Management.

4. INFORMATION REQUIREMENTS OF PARTICIPANTS

Rule Participants must submit information to System Management relating to the period of the study in order for the latter to carry out a ST PASA study.

4.1 Provision of information by Participants

1. Rule Participants must submit information to System Management before 10 AM every Thursday to enable System Management to complete the ST PASA study by 4.00 PM [MR 3.17.5].
2. The information must cover the areas of activity and equipment status set out below for the 21 days commencing 8.00 AM on the day following (i.e. Friday).
3. The data should be provided through System Management's SMMITS interface system.

Network Operators

4. For a Network Operator, availability over the next Short-Term PASA Planning Horizon of all it's facilities [MR 3.17.5(a)].
5. Network Operators must confirm the outage planning data relating to their facilities that is held in the current outage schedule, and include any information on equipment outages or unavailability not previously reported to System Management through the outage planning process.

Market Generator

6. For a Market Generator, availability over the next Short-Term PASA horizon of every Registered Facility that are generating works [MR 3.17.5(b)].
7. Market Generators must confirm the outage planning data relating to their facilities that is held in the current outage schedule, and include any information on equipment outages or unavailability not previously reported to System Management in the outage planning process.

Market Customer

8. For a Market Customer, availability over the next Short-Term PASA Horizon of all its Curtailable Load and Interruptible load Facilities.
9. Market Customers must provide information on the non-availability of Curtailable Load and Interruptible Load Facilities not previously reported to System Management as part of the Facility Outage Procedures. The information should be in a format similar to that in Appendix II of this procedure.
10. Market Customers must provide System Management with information on demand forecasts for loads designated as Significant Loads by System Management, where these loads are anticipating a major change to the demand pattern of the Significant Load.
11. System Management will consider a consumer load to be a Significant Load when its peak demand is in excess of 20 MW.
12. System Management will consider a major change to the demand pattern of a Significant Load to be an increase or decrease of at least 10 MW in the level of load that would normally occur, over and beyond the normal load pattern of the Significant Load, and where that change is anticipated to occur in one or more of the periods set out in table 1 below.

Table 1

Season	Weekday Morning	Weekday Evening
Winter	7.00-9.00 AM	5.00-8.00 PM
Summer	-	Midday to 6.00 PM

13. Market Customers will provide System Management with the load change information for each Significant Load for the relevant Trading Interval.

4.2 Submission of Revised Data

1. Where a Market Participant or Network Operator becomes aware that the information submitted in accordance with section 4 of this procedure has materially changed during the first week of the period covered by the previous Short Term PASA study, then it must re-submit the relevant data to System Management as soon as possible, and in any case within 24 hours [MR 3.17.6].
2. The revised data must include any variations to capacity or performance from that recorded in the standing data, and changes from the details in the outage plans submitted to System Management.
3. Where System Management considers that these changes will have a significant impact on the level of Capacity Planning Margin forecast for that period, a special ST PASA report containing information on the changed levels of planning margin must be prepared.

4.3 Format of Submitted Information

Market Participants and Network Operators providing revised Facility availability and performance data to System Management in accordance with this section 4 must provide the information in the form specified in Appendix I of this procedure.

4.4 Possible Errors or Omissions

1. Where System Management has not received information from a Participant in the time required, or there are omissions or possible errors in the information, System Management may contact the participant to seek clarification or further details.
2. The Participant must respond to this request in the earliest time practical with the necessary information.

4.5 System Management may use other data

1. In conducting a Short Term PASA study, System Management may, in place of information provided in accordance with section 4 of this procedure, use information developed by System Management [MR 3.17.8]. System Management may also use information developed by System Management in relation to:
 - a) SWIS Operating Standards;
 - b) Ancillary Service Requirements;
 - c) Ancillary Service Contracts; and
 - d) load forecasts.

4.6 Confidentiality of Information

1. In publishing the ST PASA report, System Management will endeavour to ensure that as much as is practical, individual participant's data submitted to the System Management cannot be identified. Information will be published in aggregate form for each class of market participant.

5. ST PASA LOAD FORECAST

System Management must prepare a load forecast for the SWIS system for each of the 21 days covered by ST PASA using a short term modelling and forecasting system. The load forecast modelling system must forecast daily peaks using statistically derived trends in daily, weekly and monthly demand patterns and weather conditions.

The forecasts must take account of data provided to System Management by Market Customers on Significant Loads.

5.1 Peak System load forecasts

1. System Management must forecast for each day of ST PASA:
 - a) a mean forecast of the peak system load in each of the six hour study periods listed in the table;
 - b) a mean plus one standard deviation forecast of the peak system load in each of the six hour study periods listed in the table;
 - c) a mean plus two standard deviation forecast of the peak system load in each of the six hour study periods listed in the table; and
 - d) a forecast of the minimum system load in the 2.00 AM - 8.00 AM study period.
2. The forecasts will provide an estimate of the peak or minimum system load condition for each of the study periods listed in table 2 below.

TABLE 2				
Period of Day	8.00AM to 2.00PM	2.00PM to 8.00PM	8.00PM to 2.00AM	2.00AM to 8.00AM
SWIS forecasts	Peak MW	Peak MW	Peak MW	Peak MW
				Minimum MW load

5.2 Publish description of Forecast Model

1. System Management must publish a description of its short-term load-forecasting model as part of the initial short term PASA report.
2. System Management must update this description as System Management forecasting techniques are developed and evaluated against actual system load levels and load patterns in the SWIS market.

6. ST PASA PLANNING CRITERIA

System Management must make allowance in its assessment of power system adequacy for both planned and unplanned outages of generation, demand and transmission facilities.

The allowance for unplanned outages, ie forced outages, must be sufficient to provide Participants with a reasonable level of confidence that day to day peak loads will be met without risk to supply or consumer confidence, but without providing for excessive and unnecessary levels of equipment redundancy. The security standard System Management must use for this purpose will be the current SWIS standard as reflected by the following criteria.

6.1 Generation Security

System Management must allow for sufficient generation to be available to cater for forced outages of generation facilities. The value of unplanned unavailability will be the loss or unavailability of the largest single generating unit planned to be available at that time on the SWIS.

6.2 Transmission Security

1. System Management must allow for sufficient transmission facilities to be available to cater for:
 - a) forced outages of transmission facilities, as specified within the security levels contained in the System Operations Security Procedure; and
 - b) operating within the boundaries represented by the applicable operating standards and technical limits defining the SWIS technical envelope.

6.3 Ancillary Services

System Management must allow for sufficient Ancillary Services to be available, taking into account the non-availability of facilities that perform ancillary service roles, to meet the SWIS security criteria.

6.4 Demand Management

System Management must prepare ST PASA on the basis that all Curtailable Loads and Interruptible Loads will be available at the levels and capacity quoted by Market Customers.

7. ST PASA CAPACITY PLANNING MARGIN

System Management must assess the “Capacity Planning Margin” for each six-hour study period within the ST PASA planning horizon using the criteria set out in section 7.1 of this procedure [MR 3.18.11].

The Capacity Planning Margin is defined as the spare generation available after the forecast peak load has been met, all demand management capacity has been utilised, and all security and ancillary service requirements have been satisfied.

7.1 Calculation of Generation Planning Margin

1. System Management must estimate the applicable Capacity Planning Margin by forecasting [MR 3.18.11]:

- a) the capacity of the total generation and Demand Side Management facilities remaining in service after allowing for the outages that System Management have been informed of and including an assessment by System Management of the expected output from non-scheduled generation facilities, less
- b) the mean plus two standard deviation system load forecast from section 5 of this procedure and ensuring that,
- c) the transmission capacity remaining in service must be capable of allowing the dispatch of the generation capacity referred to in (a) above, and that
- d) the Facilities remaining in service must be capable of meeting the applicable Ancillary Service Requirements, which means ensuring that generation and demand management capacity needing to be dispatched in an ancillary service role is provided for, and
- e) the facilities remaining in service must allow System Management to operate the power system within the applicable technical envelope and the applicable SWIS Operating Standards and the Power System Operation Procedure – Power System Security.

8. CONTENT OF SHORT TERM PASA STUDY

ST PASA study published each Thursday must set out System Management’s forecast of “capacity planning margin” for each 6-hour period within the ST PASA study horizon.

The information provided must cover each 6-hour period of the ST PASA study and may be presented in graphical form similar to but not restricted to the layout in Appendix V of this procedure.

System Management must highlight in its results those periods within the ST PASA planning horizon where Capacity Planning Margin is zero or negative and where changes to outage plans are needed to restore the Capacity Planning Margin to a positive level.

The published study must also provide graphical representation of the information on generation capacity and forecast data from which System Management’s estimation of the Capacity Planning Margin was compiled, as well as other data detailed in Section 8.1 of this procedure.

8.1 Aggregate forecast information on ST PASA

- 1. System Management must include in the ST PASA report the information listed in table 3 below. Information explaining the derivation of these system parameters and variables is contained in Appendix III of this procedure.

TABLE 3 – [MR 3.17.7]	
ST PASA Reporting Parameter	Description (see Appendix III for details)
1. Capacity Planning Margin	Ref section 7
2. Peak Load Forecasts	The peak load estimate for the SWIS for the following scenarios: <ul style="list-style-type: none"> i. mean; ii. mean plus one standard deviation; and iii. mean plus two standard deviations.

3	Minimum load forecasts	The minimum overnight load forecasts as estimated for each of the 6-hour overnight study periods defined in 5.1d.
4	Forecast total installed generation capacity	The total installed generation capacity forecast for each six hour study window in the ST planning horizon
5	Forecast total available Generation Capacity	The total available Generation Capacity available in each 6-hour study window
6	Forecast total available Demand Management Capacity	The total available Demand Management capacity available in each 6-hour study period
7	Unsecure capacity margin	The quantity defined in Rule 3.17.9(d) and being for each 6-hour study period; the “mean plus 2 standard deviation peak load forecast, minus the total forecast available generation capacity, minus the total forecast available demand side management capacity
8	Transmission Constrained Capacity	Any generation capacity output constrained as a consequence of transmission limitations.
9	Provision for unplanned loss of Generation Facilities	The provision for unplanned un-availability of generation facilities (forced outages).
10	Ancillary Services	The quantity of generation capacity diverted to serve as an ancillary service, and not available for energy supply purposes
11	Additional Data	Any parameter that System Management considers useful in highlighting information relevant to the adequacy of the SWIS over the study period

8.2 Explanatory information in ST PASA report

1. System Management must include as an attachment to the ST PASA report additional information to assist Participants in understanding and utilising the information in ST PASA.
2. The additional information should focus on explaining events and situations that have lead, or likely to lead, to security issues and possible shortfalls in supply capacity.
3. Where there are significant differences in the level of Capacity Planning Margin between consecutive ST PASA reports, and where these are due to factors other than a change on outage plans, System Management should endeavour to provide an explanation for these changes.
4. System Management must also provide information on the following areas of performance where they are relevant to ongoing capacity requirements of the SWIS and Ancillary Service planning:
 - a. information on regions of the SWIS subject to transmission constraints, including information on transmission outages of which System Management is aware, forecast transmission capacity between potentially constrained regions, and any likely constraints **[MR 3.17.9(f)]**;
 - b. information on possible security problems that could affect market or dispatch outcomes **[MR 3.17.9(g)]**;

- c. information on potential fuel supply, transport or storage limitations that could affect generation capacity of which System Management is aware [MR 3.17.9(h)]; and
- d. information on System Management's estimate of the quantity of non-scheduled generation capacity that can reasonably be expected to be available during the different 6-hour study periods.

8.3 Use of System Management data

1. System Management must include with its ST PASA report the details of any use by System Management of its own data in place of data provided in accordance with section 4 of this procedure, and the reasons why System Management's data was substituted [MR 3.17.8].
2. System Management must provide a description of the forecast methodology followed in preparing the ST PASA load forecast. This description will be provided as an attachment to the first ST PASA report published, and will be updated by System Management as the forecasting model is developed.

9. CONFIDENTIALITY OF INFORMATION

1. In performing its functions under the Market Rules, System Management may be required to disclose certain information to Market Participants and Network Operators. In selecting the information which may be disclosed, System Management will utilise best endeavours and act in good faith to disclose only the information reasonably required by the application of the Market Rules.
2. Where System Management has received information from a Market Participant or Network Operator as a consequence of the information requirements of ST PASA and the information is specific to and identifiable with the operations of the Market Participant, System Management will first notify that Participant of System Management's intention to report the information in ST PASA.
3. Where that Participant considers the information to be commercially sensitive and confidential it should communicate this view to System Management.
4. Where System Management considers that release of the information is important to the security of the power system, System Management should refer the matter to the IMO for consideration under chapter 10 of the Market Rules.

10. NOTIFICATION OF NON-CONFORMING OUTAGES

After publication of the ST PASA report, System Management must contact any Market Participant or Network Operator who has an outage planned that has been identified in ST PASA as causing the Capacity Planning Margin to become zero or negative.

The subsequent actions of System Management and the affected Participant must be in accordance with the Power System Operating Procedure – Facility Outages.

APPENDIX I PRESENTATION OF INFORMATION ON CHANGES TO AVAILABILITY AND PERFORMANCE OF GENERATION FACILITIES

Where a Market Participant is required under this procedure to provide System Management with information on the changed status of a facility, it should be provided in the format set out in table 4. The table provides for two different types of change:

- a) Where the planned availability of the Facility has changed
- b) Where the performance of the facility has changed, such as represented by a change in a parameter in the standing data database.

Participants will fill in the details as applicable.

TABLE 4	
Market Participant or Network Operator	
Identity of Facility	
Description of item of equipment in Facility.	
A. Revised Outage Data or cancellation of planned outage: <ul style="list-style-type: none"> i. Outage description and reference ii. Starting time and date iii. Finishing time and date 	
B. Performance change <ul style="list-style-type: none"> i. Description of performance Parameter ii. Revised data iii. Starting time iv. Finishing time 	
Other relevant Information	

APPENDIX II PRESENTATION OF INFORMATION ON CHANGES TO AVAILABILITY AND PERFORMANCE OF DEMAND MANAGEMENT FACILITIES

Market Customers must provide the information in Table 5 for each 6 hour period of the 3-week Short Term planning horizon for each Curtailable Load Facility, where the available MW of the Facility differs from the availability required under the Facilities MW Capacity Reserve obligation, or the availability as indicate by the Outage Plans submitted in respect of the Facility.

TABLE 5		
Name of Facility:		
Substation Supply Point to Demand Management Facility:		
	Curtailable load MW capacity that the Facility can contribute in the applicable 6-hour period.	
Day of ST PASA planning horizon	8.00AM to 2.00PM planning period	2.00PM to 8.00PM planning period
Day 1 – 00/00/00		
Day 2		
..		
..		
Day 20		
Day 21		

APPENDIX III

INFORMATION CONTAINED IN ST PASA REPORT

Further explanation of the parameters reported in the ST PASA study.

Capacity Planning Margin

The Capacity Planning Margin as defined in Section 7

Peak Load Forecasts

The peak load forecasts for the SWIS, being the highest Trading Interval MWh forecast for each study period, prepared in accordance with Section 5 and covering the following load demand scenarios:

- mean;
- mean plus one standard deviation; and
- mean plus two standard deviations.

Minimum load forecasts

The minimum overnight MWh load forecast for the SWIS for a Trading Interval in the 2.00AM to 8.00AM study period, prepared in accordance with section 5.

The level of minimum overnight system load may be a dominant factor in setting the quantity of load following reserve required to maintain frequency. Where System Management considers that there may be constraints on the supply of load following reserve or difficulties at these times with dispatching adequate level of generating capacity, these issues should be reported through ST PASA.

Installed Generation Capacity

The total installed generation capacity on the SWIS system. This will include current installed capacity and any changes to the level of installed Scheduled and Non-Scheduled Generation capacity, of which System Management has been informed.

Available generation capacity

The available scheduled generation capacity in each six hour study period in the ST PASA planning horizon. The estimate will include the expected generating levels of non-scheduled generation during each 6-hour study period.

Where a generating facility is only available for part of the 6-hour period, it should be presumed for the purpose of producing ST PASA that the facility will not being available for all of that period.

Where insufficient generating capacity is identified in a six-hour study period, this premise must be reviewed. If an outage commences or ends within a 6-hour study period and examination of the intra 6-hour period demonstrates that a more detailed

analysis may reduce or eliminate the conflict, a more detailed examination should be undertaken by System Management.

As a result of this analysis, System Management may renegotiate the commencement and/or completion times of outage plans with Market Participants or Network Operators that have submitted plans for that 6-hour period.

Available Demand Management Capacity

The total available Curtailable Load capacity available in each 6-hour study window.

The estimate of demand management capacity provided by each Market Customer in accordance with Section 4 and Appendix II for a demand management facility should be taken by System Management as being available at that quoted figure throughout the 6-hour period. The total sum of the available Demand Management capacity in any trading period will be the sum of the individual demand capacity reductions that Market Customers have provided information for.

System Management must ensure that the duration and frequency of forecast operation of each Curtailable Load is consistent with the Reserve Capacity Obligations for that Curtailable Load.

Transmission Constraints

The quantity of Generation output that is forecast to be constrained off at the time of the SWIS peak as a consequence of constraints on the transmission network.

Provision for unplanned loss of Generation Facilities

The provision System Management has made for the unplanned loss or unavailability of generation facilities in accordance with the ST Planning criteria. (Section 6).

Ancillary Services

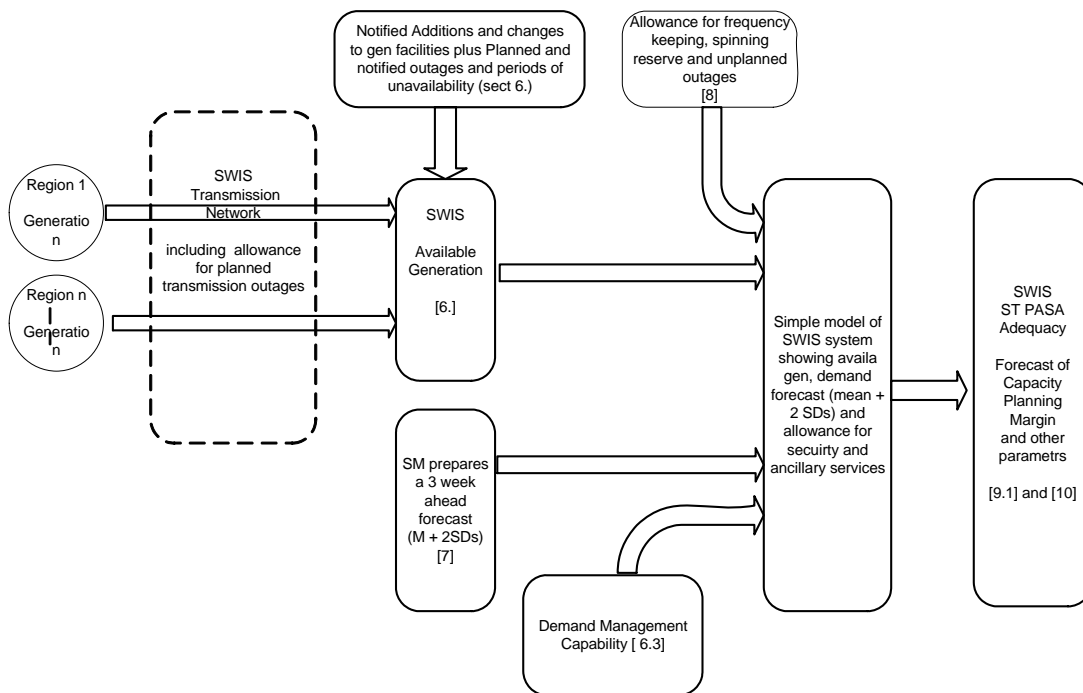
The assessment by System Management of the quantity of **load following reserve**, **spinning reserve** and **15 minute reserve** (or its fast start equivalent) that must be provided in each 6-hour study period in ST PASA.

- a) The quantity of **load following reserve** needed during each study period, to be determined in accordance with Market Rule 3.10.1 and the Power System Operation Procedure – Power System Security. The supply of load following reserve will be from EGC Generation and any Non-EGC Generating Facility whose Load Following Services have been secured by an Ancillary Service contract.
- b) The quantity of **spinning reserve** needed during each study period to be determined in accordance with Market Rule 3.10.2 and the Power System Operation Procedure – Power System Security. All spinning reserve will be provided from EGC and Non-EGC Generation Facilities whose spinning reserve services have been secured by an Ancillary

Service contract, and from Interruptible Loads whose services have been contracted by System Management.

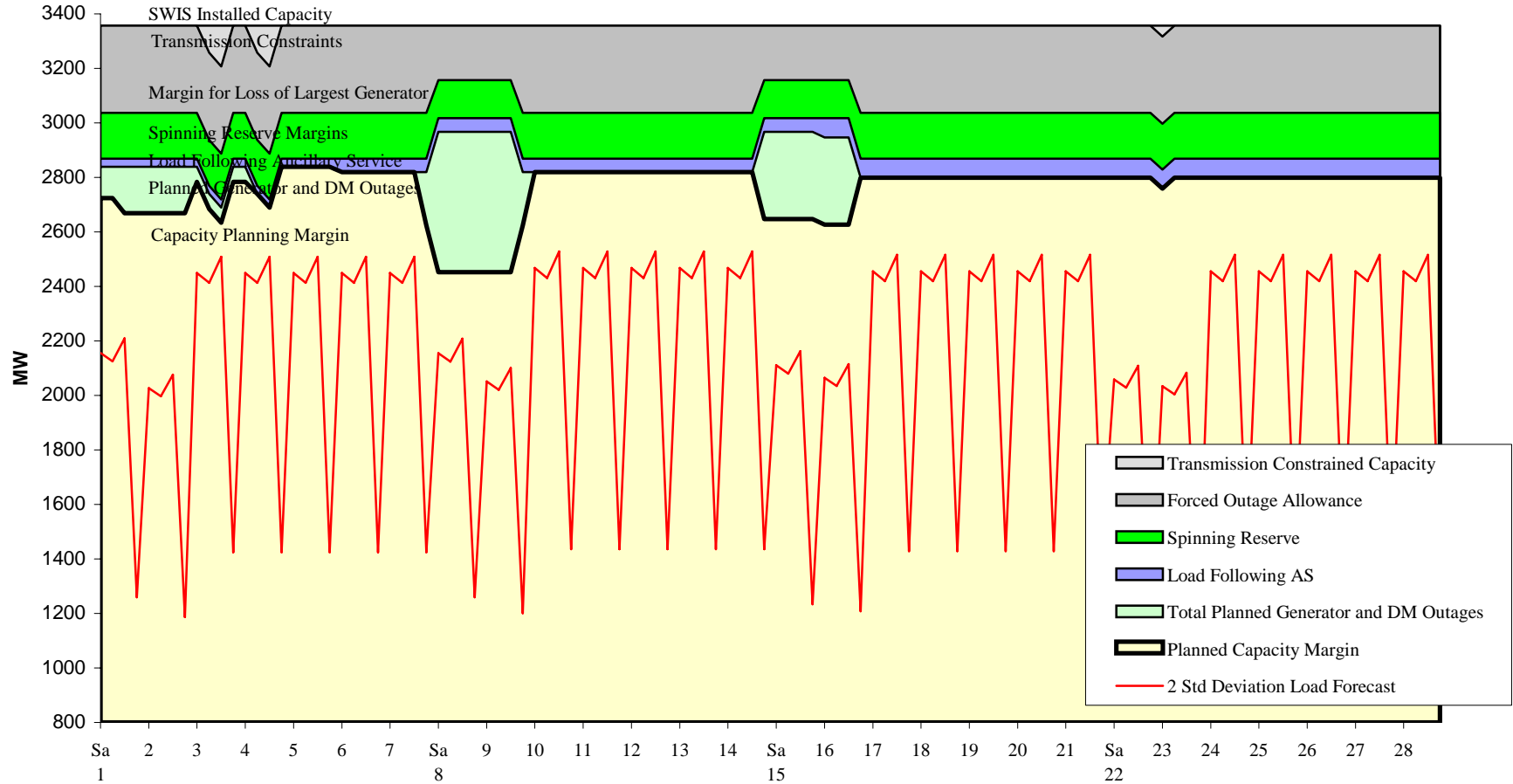
- c) The quantity of **ready reserve** available to allow the power system to recover to normal frequency after a major loss of generation, and re-establish normal levels of security.
- d) In assessing how the spinning reserve requirement will be met, System Management will first give priority to the confirmed Interruptible Load contracts. These should be accepted up to the maximum level permitted after allowing for the need to maintain a minimum quantity of Load Following reserve.
- e) The assessment of ancillary service requirements will enable System Management to quantify the quantity of generation capacity that must be diverted to serve as an ancillary service, and therefore not available for normal merit order energy dispatch.

APPENDIX IV OVERVIEW OF ST PASA PROCESS



APPENDIX V

SWIS ST PASA - 3 Week 1 Apr 06 - 28 Apr 06



ELECTRICITY INDUSTRY ACT

ELECTRICITY INDUSTRY (WHOLESALE ELECTRICITY
MARKET) REGULATIONS 2004

WHOLESALE ELECTRICITY MARKET RULES

Power System Operation Procedure

Short Term Projected Assessment
of System Adequacy (ST PASA)

Commencement: This Market Procedure is to have effect from 8:00am (WST) on the same date as the Wholesale Electricity Market Rule, in which this procedure is made in accordance with, commences.

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1. SHORT TERM PROJECTED ASSESSMENT OF SYSTEM ADEQUACY ('ST PASA')

This Procedure, Power System Operating Procedure Short Term Projected Assessment of System Adequacy ('ST PASA'), details procedures that System Management and Rule Participants must follow in the preparation and publication of the Short Term Projected Assessment of System Adequacy report.

2. RELATIONSHIP WITH MARKET RULES

1. This Procedure has been developed in accordance with, and should be read in conjunction with clause 3.17 of the Wholesale Electricity Market (WEM) and Rules (Market Rules).
2. References to particular Market Rules within the Procedure in bold and square brackets **[MR XX]** are current as at 16 October 2008. These references are included for convenience only, and are not part of this procedure.
3. In performing its functions under the Market Rules, System Management may be required to disclose certain information to Market Participants and Network Operators. In selecting the information that may be disclosed, System Management will utilize reasonable endeavours and act in good faith to disclose only the information reasonably required by the application of the Market Rules.

3. SCOPE

The ST PASA Procedure details processes that Rule Participants and System Management must follow in conducting Short Term PASA studies to assist System Management in setting Ancillary Service requirements, assessing final approval of Planned outages, assessing the availability of capacity holding Capacity Credits amongst other functions associated with the management of Power System Security and Power System Reliability in the SWIS.

Similarly, Medium Term Projected Assessment of System Adequacy studies are derived from a common formulation, but is instead based on a longer three year planning horizon.

4. ASSOCIATED PROCEDURES AND OPERATION STANDARDS

The following Power System Operation Procedures are associated with this ST PASA procedure:

- a. Power System Operation Procedure – Power System Security
- b. Power System Operation Procedure – Facility Outages
- c. Power System Operation Procedure – MT PASA

5. TIMETABLE FOR ST PASA

1. The timing requirements that System Management must follow when completing and reviewing a Short Term PASA study, the provision of this information to the Independent Market Operator ('IMO'), and the IMO's obligation to publish the relevant information are defined in the Market Rules [MR 3.17.1, MR 3.17.2 and MR 3.17.6].
2. Where a Rule Participant becomes aware that information submitted in accordance with the Market Rules [MR 3.17.5] has materially changed during the first week covered by the previous ST PASA study, System Management shall modify the ST PASA study and resubmit to the IMO.
3. A material change may be quantified as being equivalent to a loss of a major generator capable of generating more than 300 MW or other circumstances which System Management deems necessary.
4. System Management will prepare and maintain an internal process detailing how and by which method the ST PASA results are transmitted to the IMO.

6. INFORMATION REQUIREMENTS

6.1 General Requirements

1. System Management may direct Rule Participants in writing from time to time to provide the information specified in the Market Rules [MR 3.17.5].
2. A Market Customer must provide information on demand forecasts for loads designated as Significant loads, where these Market Customers are anticipating a major change to the demand pattern of the Significant Load. In defining a Significant Load System Management will consider the following:
 - a) a consumer load will be deemed a Significant Load when its peak demand exceeds 20MW or connection is made to a transmission system consuming in excess of 10 MW;
 - b) a major change to the demand pattern of a Significant Load to be an increase or decrease of at least 10 MW in profile of a load exceeding 20MW, where that change is anticipated to occur in one or more of the periods set out in table 1 below; or

Season	Weekday Morning	Weekday Evening
Winter	7.00-9.00 AM	5.00-8.00 PM
Summer	-	Midday to 6.00 PM

- c) Market Customers must provide System Management with the load change information for each Significant Load for the applicable period.

3. Rule Participants must use reasonable endeavours to provide System Management with a reasonable estimate of the amount of demand side management capacity that can be provided.
4. With the exception of demand side management, where information is provided by Network Operators, Market Generators and Market Customers this information must be provided via the System Management Market Information Technology ('SMMITS') web interface system, unless otherwise directed.
5. Rule Participants must provide demand side management related information to System Management via email, unless otherwise directed.

6.2 Allowable Use of System Management Data

System Management may utilise its own information in certain circumstances in substitution of information submitted by Rule Participants in accordance with the Market Rules [MR 3.17.8], and shall document reasons for doing so in the ST PASA report.

6.3 Submission of Revised Data

1. When a Rule Participant becomes aware of circumstances relating to material changes in ST PASA detailed in the Market Rules, Rule Participants must submit revised data including:
 - a) any variations to capacity or performance from Standing Data; and
 - b) changes from the details in the outage plans submitted to System Management.

6.4 Possible Errors or Omissions

1. Where System Management has not received information from a participant in the time required, or the information contains either omissions or possible errors, System Management may use reasonable endeavours to contact the participant to seek clarification or further details.
2. The participant must respond to this request in the earliest time practical.

6.5 Situations where System Management can use its own information

In addition to information provided by a Rule Participant, System Management may use information that it develops pursuant to the Market Rules [MR 3.17.7], and any other information System Management considers necessary.

7. ST PASA LOAD FORECAST

1. System Management must prepare a load forecast for the SWIS system for each of the 21 days covered by ST PASA using System Management's modelling and forecasting system. The load forecast modelling system must forecast daily peaks using statistically derived trends in daily, weekly and monthly demand patterns and weather conditions. Account must be taken of the data on Significant Loads.

7.1 Peak System Load Forecasts

System Management must ensure that the results of a Short Term PASA study includes, for the Short Term PASA Planning Horizon, the peak load forecasts for scenarios stipulated in the Market Rules [MR 3.17.9(a) and MR 3.17.9(b)].

8. ST PASA PLANNING CRITERIA

8.1 Generation Security

System Management must allow for sufficient generation to be available to cater for forced outages of generation facilities. The value of unplanned unavailability will be the loss of the largest total generation, remaining after outages have been accounted for, resulting from a single contingency event.

8.2 Transmission Security

System Management must adjust total generation, to take account of any constraints on the transmission system, after allowing for all credible contingencies specified in the PSOP: Power System Security and maintain operations within the boundaries of the Technical Envelope.

8.3 Ancillary Services

System Management must allow for sufficient Ancillary Services and Ready Reserve generation to be available, taking into account the non-availability of facilities that provide Ancillary Services, to meet the criteria specified in the PSOP: Power System Security and maintain operations within the boundaries of the Technical Envelope.

8.4 Demand Management

System Management must prepare the ST PASA based on a reasonable forecast of the availability of all Interruptible Loads.

9. ST PASA RESERVE MARGIN

System Management must assess the "Reserve Margin" for each study period within the ST PASA planning horizon.

The Reserve Margin is defined as the spare generation available after the forecast peak load has been met, and all security and ancillary service requirements have been satisfied.

9.1 Assessment of the Reserve Margin

1. System Management must estimate the applicable Reserve Margin by forecasting:
 - a) the capacity of the total generation remaining in service after allowing for Planned, Scheduled and any other outages that System Management has knowledge of or has been informed of, less
 - b) the mean plus two standard deviation system load forecast or expected load including a margin for uncertainty and ensuring that,
 - c) the effects of any Generation being constrained due to insufficient transmission capacity remaining in service, less

- d) an allowance for that quantity of generation capacity required to operate as an Ancillary Service, to maintain the frequency standards specified in the PSOP: Power System Security, less
 - e) as quantified within the planning criteria set out in section 8 of this procedure.
2. The facilities remaining in service must allow System Management to operate the Power System within the applicable Technical Envelope and the criteria specified in the PSOP: Power System Security.

10. CONTENT OF SHORT TERM PASA STUDY RESULTS REPORT

1. The ST PASA Study Results Report (ST PASA report) must set out the forecast value of the Short Term Reserve Margin, the data set out in the Market Rules, and other data relevant to the short term security assessment of the SWIS system.
2. Where practical, the information should be presented in graphical form in SMMITS and cover each period of a 3 week ST PASA planning horizon.
3. System Management must highlight in its results those periods within the ST PASA planning horizon where Reserve Margin is zero or negative and where changes to outage plans are needed to restore the Reserve Margin to a positive level.
4. The published study must also provide graphical representation of the information on generation capacity and forecast data from which System Management's estimation of the Reserve Margin was compiled, as well as an estimate of the applicable Reserve Margin.

10.1 Aggregate forecast information on ST PASA

1. System Management must include in the ST PASA report the information set out in the Market Rules [MR 3.17.9] and the additional information listed in Table 1 below for each day of the ST PASA planning horizon.

TABLE 1 ST PASA Reporting Parameter		Description
1.	Reserve Margin	The quantity defined in Rule 3.17.9(d) and being for each study period, the 'mean plus 2 standard deviation peak load forecast, minus the total forecast available generation capacity.
2.	Peak Load Forecasts	The peak load estimate for the SWIS for the following scenarios: i. mean; ii. mean plus one standard deviation; and iii mean plus two standard deviations.
3.	Minimum load forecasts	The minimum overnight load forecasts as estimated for each of the overnight study periods.
4.	Forecast total installed generation capacity	The total installed generation capacity forecast for each study window in the ST planning horizon.
5.	Forecast total available	The total available Generation Capacity available in each

	Generation Capacity	study window.
6.	Forecast total available Demand Management Capacity	The total available Demand Side Management capacity available in each study period.
7.	Transmission Constrained Capacity	Any generation capacity output constrained as a consequence of transmission limitations.
8.	Provision for unplanned loss of Generation Facilities	The provision for unplanned un-availability of generation facilities (forced outages).
9.	Ancillary Services	The quantity of generation capacity diverted to serve as an ancillary service, and not available for energy supply purposes.
10.	Additional Data	Any parameter that System Management considers useful in highlighting information relevant to the adequacy of the SWIS over the study period.

10.2 Explanatory information in ST PASA report

1. System Management may include as an attachment to the ST PASA report additional information to assist Participants in understanding and utilising the information in ST PASA.
2. System Management should use reasonable endeavours to provide explanation of changes where there are significant differences in the level of Reserve Margin between consecutive ST PASA reports

11. AGGREGATION OF INFORMATION

1. In publishing the ST PASA report, System Management will endeavour to ensure that as much as is practical, individual participant's data submitted to the System Management cannot be identified. Information will be published in aggregate form for each class of Market Participant.